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JUNE 1998  
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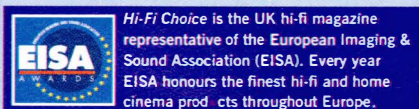
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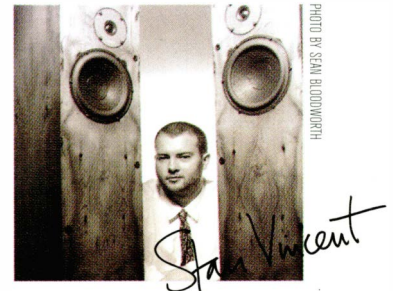
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*Hi-Fi Choice* is the UK hi-fi magazine representative of the European Imaging & Sound Association (EISA). Every year EISA honours the finest hi-fi and home cinema products throughout Europe.

# Editor's Notebook



Stan Vincent gives the background to this month's world exclusive cover story. Is CD-R the ultimate digital recording format?

Until now, both hardware and software for CD recording has been strictly priced for enthusiasts. However, by smashing through the £500 barrier with its new CDR880 (reviewed on p10), Philips has made CD recording an affordable domestic pastime. What's more, this machine's arrival has coincided remarkably with numerous announcements of 'affordable' blank CD-Rs (see p9), adding further fuel to the fire.

So much has changed in so few years. Back in *HFC* 148, November 1995, our coverline screamed "World's First Home CD Recorder". The item in question was the Pioneer PDR-05, priced at a hefty £1,300, while blank audio CD-R discs lasted only 60 minutes and cost a cool £15.

Today the hardware costs less than half as much. The PDR-05 has dropped to £1,000 and a lower-spec version, the PDR-04 costs £700. Philips's CDR880 launches at a penny under £500 but is certain to be heavily discounted come the autumn. And that's before Philips launches two other CD-recording decks (see p36) at even lower price-points. Inside sources also suggest we'll see upmarket Marantz versions of the Philips CD-R product in due course.

## Gadgets galore

So the technology is affordable and available, but do we really need it? After all, cassette tape has been refined to an incredible degree over the past 30 years or so. And the latest CD players and cassette decks have quite sophisticated synchronisation and track-editing facilities, which make light work of copying tracks from CD onto tape.

But even the slickest tape set-up can't match the ease of a direct digital dub from CD to CD-R. Just press play and off you go. You're left with a disc that is a precise digital clone of the original, losing nothing but the label artwork. And it should play on any regular CD player, of which there are millions in homes and offices worldwide. The 'rewritable' CD-RW option, meanwhile, opens up intriguing possibilities for audio manipulation on a computer.

Does this leave MiniDisc looking a little sick? The alternative digital recording format, developed by Sony and known as MD

for short, uses a much smaller disc and thus, to the audible groans of audiophiles, has to throw away parts of music it thinks you can't hear.

Until recently MD's advantage was its re-recordability, but now Philips has matched this with CD-ReWritable (CD-RW). However, MD is arguably more versatile for making up temporary compilations: it allows users to name tracks and whole discs, and being so tiny, it is infinitely more portable — as is the hardware. At present, £4-£5 rerecordable MDs are cheaper than £18-£20 CD-RWs, though the price of the latter can only go down.

In summation, CD-R/CD-RW offers better sound quality and widespread compatibility, where MD offers greater editing functionality and portability. As usual, it is your decision: you pay your money and you makes your choice!

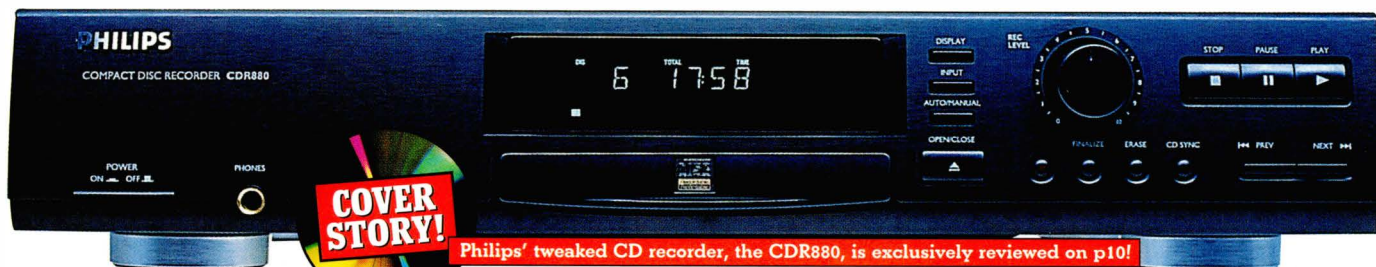
## Watts cookin'

In *HFC* 177, Paul Messenger stired up a bit of a hornet's nest by suggesting that a 250 Watts amp didn't go substantially louder than an alternative rated at a quarter of the power. One letter from a manufacturer (this issue, p24) and a clarification by the Tech Ed (p20) later, we find that Paul's methodology was well meaning but somewhat flawed — though I'm determined to consider this a learning experience. There's always more to hi-fi than meets the ear. Sometimes measurements are the only way to clarify what's going on, and certainly, as Paul reveals this month (p23), the mighty Musical Fidelity has emerged with its testosterone intact...

## Music, Maestro!

In yet another *Hi-Fi Choice* scoop, this month we have secured a most intriguing — and wonderful — competition prize. On page 56 you will see displayed the new Music Maestro system from Sound Management Services. This combines two Pioneer multi-CD 'jukeboxes' and controls them with sophisticated PC software. Not only is this an ideal way to store 200 CDs at your fingertips, it will also ensure your dinner parties are never again interrupted by an impromptu visit to the hi-fi!

Enjoy your listening this month...



Philips' tweaked CD recorder, the CDR880, is exclusively reviewed on p10!

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**WIN! WIN! WIN!**  
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# Update

THIS MONTH... MUSICAL FIDELITY 'NU-VISTA' TUBE... DENON MD RECORDER... GLLIMAGIO... AND MUCH MORE...

## In brief



B&W Nautilus: British excellence.

### B&W's £35,000 Nautilus

Loudspeaker has been selected by the Design Council as one of 202 Millennium Products, which will be promoted by the Design Council throughout the world as "examples of British excellence". ☎ (01705) 750750

Maplin Electronics' bi-annual components catalogue has been made available on CD-ROM for both IBM-compatible and Apple Macintosh users. In addition to featuring 1,000 new products, it includes a number of 'how-to' videos, an easy-ordering facility and details of Maplin's 48 UK stores. ☎ (01702) 554002 • www.maplin.co.uk

Overture Hi-Fi of Banbury will hold an Arcam/Mission musical evening, on June 8th at the Whitley Hall Hotel in Banbury. Free tickets are available from the store on ☎ (01295) 272158. Overture claims that the evening will include a demonstration of Arcam's long-awaited Alpha 9 CD player.

After 50 years at the site of The Acoustical Manufacturing Co., and following Quad's absorption into the International Audio

## Hasta la Nu-Vista



Musical Fidelity's 'Nu-Vista': resurrected but limited to 500.

Musical Fidelity has resurrected the nuvistor, "last tube ever to be developed", as the foundation of a new, limited-edition remote-control preamp.

The £1,200 preamp, which will be known as Nu-Vista, claims to capitalise on the nuvistor's claimed low noise, robust, extremely linear performance. The manufacturer says it will combine the "uncoloured" mids and tops of a tube design, with the "deep, extended, fast" bass of solid state.

Delivered in the style of Musical Fidelity's X-A1 (Update, HFC 174), the Nu-Vista incorporates a "high quality" phono stage, claims to operate in "pure Class A", and has an external power supply.

## Onkyo's perfect balancing act

Onkyo's new TX-SV545 Dolby Pro-Logic AV receiver is a stepping stone between an entry-level AV system and the more exalted heights of 5.1-channel Dolby Digital movie replay. Though not equipped with a Dolby Digital decoder it has the requisite inputs to hook up with one, and has the five channels of amplification necessary to reproduce such signals. The amps are rated at 95 Watts to each of the front three channels and 35 Watts to the rears.

Dolby Pro-Logic processing takes place in the digital domain courtesy of a 24-bit Motorola DSP chip. Another AV enhancement is Cinema Re-EQ from LucasFilm, the company which sets the high-end Home THX standard.

There are four audio and three AV inputs, plus three line-level outputs to provide for power-amp upgrades and multi-room applications. An RDS tuner completes this comprehensive list of features.

Audio Club ☎ (01296) 482017



Onkyo's TX-SV545 stepping stone.

Musical Fidelity says it will make only 500 of these units, but will keep a spare set of nuvistors for every unit sold. It claims this should ensure a minimum operational life of 24-30 years.

Musical Fidelity has also unveiled "one of the greatest phono stages of all time" — the £799 X-Tract. Supplied in the tubular X Series configuration, the X-Tract package comprises two monoblok modules fed from a separate power supply.

The company claims specifications including overload margin of 40dB, RIAA accuracy up to 80kHz, and low output impedance.

Musical Fidelity ☎ (0181) 900 2866



MF X-Tract: two monoblocks and a separate power supply.

## Big bass, small price

TDL has unveiled the Nucleus 3 loudspeaker, priced at £199.95 per pair. Based on the driver complement of TDL's forthcoming standmounted Nucleus 2, the senior version has a floorstanding enclosure to extend bass performance. The box is loaded by a tapered reflex port situated to the rear. A separate lower chamber may be loaded with lead shot or dry sand to impart extra stability.

Standing 750mm high, the Nucleus 3 incorporates a 130mm mid/bass drive unit with doped-paper cone, and a ferrofluid cooled tweeter with 19mm soft dome. The dividing network may be bi-wired, and the maker claims a sensitivity of 89dB, with maximum power handling of 60 Watts.

The Nucleus 3 is available in Black Ash, Rosewood and Cherry finishes.

Other models in the Nucleus range include the Nucleus 1, an "economy" version of the original Near Field Monitor, the Nucleus CCS dialogue speaker, and the SBR passive subwoofer.

TDL ☎ (01628) 850111



HI-FI CHOICE

# Denon's defrag delight

Denon's new DMD-1000 MD recorder. Fragmentation free!



Denon's new DMD-1000 MD recorder, priced at £299.99, claims to have solved a newly-discovered problem of the MiniDisc format: fragmentation. According to Denon, this condition, known well to computer users, occurs when small pieces, or 'fragments' of musical data become widely scattered across the surface of the MiniDisc, especially with MDs that have undergone extensive re-recording and editing. The new model incorporates a 'Disc Recovery' function which claims to effect a remedy. Another key feature of the DMD-1000 is its inclusion

of ATRAC v5.0, the latest iteration of MiniDisc's data reduction system, which is said to offer 24-bit signal processing and 20-bit inputs and outputs, and to improve dynamic range and signal-to-noise ratio.

Inputs include two optical digital, one electrical digital and one analogue. Output provision comprises one optical digital and one analogue.

The DMD-1000 is styled to match Denon's 1500/1550 series separates (DCD-1550AR reviewed p87). Denon ☎ (01753) 888447



Who says a transistor radio can't have a transparent sound? BayGen's new Freeplay wind-up radios are available in translucent blue, red, green or clear, permitting users to view the unique clockwork generator mechanism in action. A useful addition to the new range is a solar panel to boost the radio's power reserves. After 25 seconds of winding, the solar panel will keep the unit playing for an unlimited time as long as the sun is shining, according to the company. The radio costs £59.95 and will be available in June. ☎ (0800) 7313052

## Yamaha springs into action

Yamaha has unveiled a complete new line of hi-fi separates, including the £299.95 MDX-793 MiniDisc recorder. Among four new CD players, the flagship is the £399.95 CDX-993, which has been modified with UK-selected, upgraded components. Other new CDs are the £229.95 CDX-593, the £179.95 CDX-493 and the £129.95 CDX-393.

The AX-392, priced at £169.95, is the only new integrated amp this year, rated at 60 Watts per channel. The HFC Recommended AX-492 amp will continue at £220.

Yamaha's highly-regarded KX-580SE cassette deck will be supplemented by the £179.95 KX-493 and £129.95 KX-393 units, the former offering Dolbys B & C, HX Pro and auto tape tuning.

The KX-W321 is a double cassette deck, retailing at £169.95, while the £179.95 TX-592RDS is a new 40-pre-set RDS tuner.

Yamaha ☎ (01923) 233166

## Lynnfield of dreams

Boston Acoustics has introduced a new flagship range of speakers, known as Lynnfield VR. All three incorporate Boston's proprietary Lynnfield tweeter, which uses a 25mm anodised pure aluminium dome and the company's Amplitude Modulation Device (AMD). Thanks to an arrangement of five tuned, hollow tubes positioned just in front of the dome tweeter, AMD is said to smooth out response in the region just before 20kHz. Furthermore, Boston says the tweeter is equipped with ferrofluid cooling and a die-cast aluminium heatsink.

Kicking off the range is the VR950 (£599.99), which features twin 135mm, long-excursion mid/bass units. Sensitivity is quoted as 90dB, power handling is said to be 150 Watts max.

Priced at £849.99 and £1,249.99 respectively are the VR960 and VR970 three-way designs which, like some Definitive Technology products, incorporate active subwoofer modules.

In the VR960 the sub is rated at 75 Watts and drives a 200mm cone. A solitary 115mm device handles midrange. While for the VR970 the rating's 100 Watts and the amp drives a 250mm transducer. To further augment LF in the '970 there's a 305mm auxiliary bass radiator. Two 115mm-diameter units handle midrange. In both speakers the AMD tweeter looks after top frequencies.

The maker cites sensitivity of 90dB for the '960 and 91dB for the '970. Power handling is quoted as 200 Watts for the former, and 250 Watts for the latter. All three designs are magnetically shielded.

Portfolio Marketing ☎ (01489) 795519



Boston's new Lynnfield VR series, priced from £600-£1,250.

## In brief

Group (IAG), the Quad service department has been incorporated into the IAG Service Centre. The latter is on Ouse Walk in Huntingdon. Telephone and fax numbers remain unchanged as ☎ (01480) 452561 and ☎ (01480) 413403 respectively. e-mail is now available on info@quadhi-fi.co.uk .

Sound Department has relinquished the NHT account. Until a new distributor is appointed, it will continue to handle customer queries, but consumers can contact NHT directly at International Department, 535 Getty Court, Benicia, CA 945519, or via the company's website: www.nhthifi.com. ☎ +1 (707) 748 5949

According to a recent survey conducted by the Consumer Electronics Manufacturers Association (CEMA) in the US, factory sales of high-end audio are on the increase. Confounding those who dismiss specialist hi-fi as an irrelevance, CEMA calculates high-end audio sales are now worth between \$1.1 and \$1.4 billion. www.cemacity.org

Walrus Systems, which has been running a virtual shop on the Internet since July last year (www.walrus.co.uk), has opened a real-life showroom in London's West End, at 11 New Quebec Street. Agencies include ATC, Living Voice, DNM, and Audio Physic. ☎ (0171) 724 7224

Audiofreaks has expanded its exclusive portfolio of high-end products with three new agencies: Magnum Dynalab FM components, Combak Corporation/Harmonix room tuning devices, and Finite Element audio furniture. ☎ (0181) 948 4153

Wilmslow Audio, famous for its distribution of loudspeaker kits, components and replacement drive-units, has acquired Hart Electronic Kits, known for its kit amplifiers based upon the designs of John Linsley Hood. Hart will be relocated to Wilmslow's operation in Broughton, Leics. ☎ 01455 286603

Grundig has announced its first DVD player, the GDV100D, which is equipped with Dolby



A veritable tour de force in high performance sound, Rotel's integrated and pre/power amplifiers have already made a big noise in the hi-fi press. The RA931 has just added a coveted WHAT HI-FI? Award for Best Amplifier in it's price class, to a list of over 60 others for Rotel hi-fi.

# Three steps to hi-fi heaven

And with prices starting at a harmonious £100, exhilarating sound has never been such good value for money.

▼ RA931 integrated stereo amplifier '...delivers remarkable extension and definition'... WHAT HI-FI? June 1997.



▲ RC971 stereo pre-amplifier and RB971 stereo power amplifier '...capable of rocking hard and fast'... WHAT HI-FI? October 1997.

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Please send me details on the full range of **Rotel amplifiers**, plus the name and address of my nearest Rotel dealer.

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# Using their Imagio

Two real-wood-veneered speakers are the first models in GLL's Imagio 300 Series. Both incorporate an improved version of the company's Inductive Coupling Technology tweeter, which operates by inductance within the mid-bass voice-coil, and thus does not require a crossover.

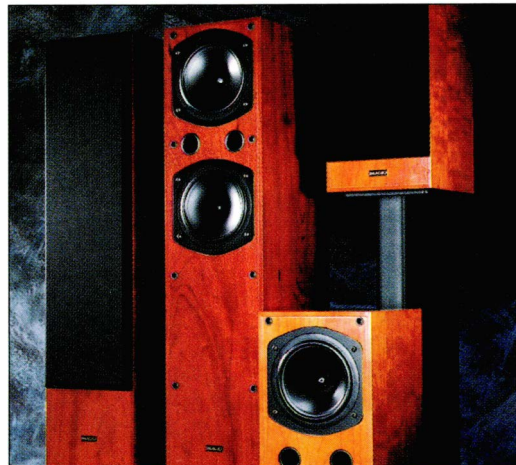
The IC318 is a 385mm-tall bookshelf loudspeaker, priced at £259.99 per pair; while the 928mm tall floor-standing IC348TL retails at £549.99. GLL offers a five-year warranty on both models.

The IC348 incorporates two 165mm-diameter mid-bass units, one with a 25mm aluminium-dome ICT tweeter. A front-facing port loads the latter driver, while a rear-ported transmission-line quarter-wave resonator loads the former unit. GLL claims 89-90dB sensitivity and power handling up to 130 Watts.

The IC318 has a single 165mm mid-bass unit with 25mm ICT, and twin front reflex ports. Power handling is specified at 100 Watts.

Both units have magnetically-shielded drive units and enclosures made from 15mm chipboard.

GLL ☎ (01705) 470875



GLL's Imagio 300 series, featuring Inductive Coupling.

## In brief

Digital and MPEG2 decoders. Priced at £579, it will include two complimentary discs: one music and one nature. ☎ (0181) 324 9461

SoundTech, a division of US pro-audio and musical instrument specialist Washburn, has delivered the world's first in-tank entertainment system — well, one of its amps powers a new tank simulator for the US military. SoundTech's £449 PS802S "PowerSource" amp claims to develop 800 Watts from an 8kg box occupying only one rack-mount unit. ☎ (0990) 1334464

UK software company Radioscope has developed software which could replace most dedicated hardware requirements of a DAB digital radio receiver. This would make possible the volume manufacture of low-cost PC cards for digital radio. RadioScape is looking for business partners in computer and electronics industries. ☎ (0171) 287 4440

Pacific Microsonics has licensed Analog Devices to include HDCD decoding and filtering on its ADSP-21061 SHARC audio DSP chip. The manufacturer claims the latter is the industry's first 32-bit HDCD decoder and expects that the chip will find applications in a wide variety of home cinema, DVD, in-car and portable applications. The same silicon will also decode Dolby Digital, DTS, MPEG and THX signals. [www.hdc.com](http://www.hdc.com)

## Digital recording accelerates



In a coincidence with our world exclusive review of the Philips CDR880 (p10), several companies have announced blank audio CD-recordable (CD-R) and CD-ReWritable (CD-RW) media for use in the Philips and similar machines.

Verbatim, a subsidiary of Mitsubishi Chemical Company, claims to use a proprietary Azo dye which guarantees that each CD-R disc will last for a 100 years life span. It estimates user prices at around £11 in the UK. ☎ (01784) 473736

Virgin Euromagnetics is offering CD-R at around £4 per disc and CD-RW at £18 per disc, and will also sell a pack of four CD-Rs and one CD-RW for £29.99. Virgin is also promoting its recently acquired distribution rights to Cdfender, a removable protective polycarbonate film which sticks to the playing side of CDs. A pack of five will retail at £5.99. ☎ (01293) 776252.

Philex claims superior data capacity for its £5.99 CD-R disc: 680 Mb rather than the standard 650Mb. Its CD-RW disc costs £19.99. ☎ (0181) 202 1717

Another innovation comes from Avery Dennison. The company has redesigned its CD Laser Label to make circular artwork easy to produce. Avery claims that labels can be centred on the disc easily and that the glue is not harmful to the polycarbonate. Available in packs of 25 sheets at the recommended retail price of £23.99, they come complete with software for Apple Macintosh computers — PC users may obtain a free formatting disk from the Avery Consumer Centre. ☎ (0800) 805020.

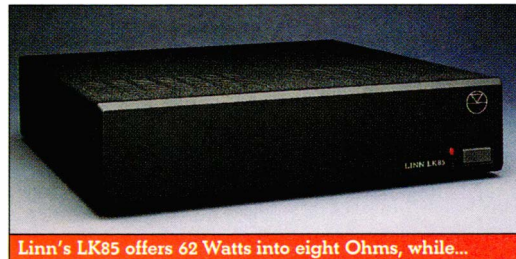
Meanwhile in another branch of digital recording, TDK has unleashed the MD-RXG range of precision-manufactured blank MiniDiscs, and the MD colour range in five translucent coloured housings. MD-RXG is available in playing lengths of 60 (£3.49) and 74 (£3.99) minutes, while MD Colour is in 74-minute lengths only (£3.99).

☎ (01737) 773773



Philex CD-RW.

## Linn's amp-le additions



Linn's LK85 offers 62 Watts into eight Ohms, while...

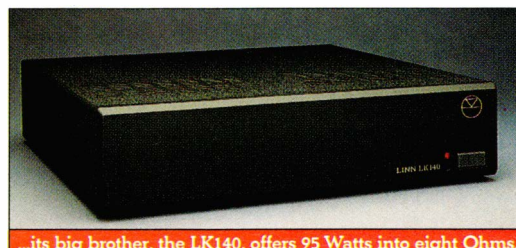
Linn has announced two successors to the long-running LK100 stereo power amp. The LK85, priced at £475, claims to develop 85 Watts per channel into four Ohms or 62 Watts into eight Ohms, while the more powerful LK140, costing £750, claims output of 140 Watts into four Ohms or 95 Watts into eight Ohms.

Linn claims the new amps benefit from "new integrated technology" and "high density surface-mount electronics", deployed in the aim of minimising signal-path lengths and enhancing reliability. Thanks to through-ventilated case-work and a shielded toroidal transformer, Linn says, the amps may be stacked with other system components.

Other features include automatic signal sensing for remote on/off switching, and protection circuitry to guard against power overload and over-heating. The amps are fully configurable for use in Linn's active hi-fi systems.

■ CD12 update: Though it has already launched the massively high-end Sondek CD12 CD player in Japan, Linn is still tantalising European audiophiles with tales of the unit's transport mech made from "solid, high-tensile aluminium ingots" and "completely new techniques for jitterless information retrieval". Though the CD12 will be remote controlled, just a touch on the front of the CD drawer will activate the transport controls, or so they say. Perhaps we have a right to expect this of a unit which is rumoured to cost around £12,000!

Linn Products ☎ (0500) 888909 • [www.linn.co.uk](http://www.linn.co.uk)



...its big brother, the LK140, offers 95 Watts into eight Ohms.

## ALBUMS PLAYED IN THE HI-FI CHOICE OFFICE THIS MONTH

- Morcheeba  
Big Calm
- The Pretenders  
The Singles
- Space  
Tin Planet
- Madonna  
Ray Of Light
- Various Ninja Artists  
Funkngufusion
- Those Magnificent Men  
What Kind Of Country Is This?
- Lenny White  
Renderers of Spirit
- Penguin Cafe Orchestra  
Concert Program
- Deep Purple  
Made In Japan
- Various  
The Love Album
- Pulp  
This Is Hardcore
- Robert Johnson  
King Of The Delta Blues Singers

# Home Victory

Just six months later after launching the cheapest CD recorder ever, Philips has introduced a revised version. Why? **Jason Kennedy**, **Stan Vincent** and **Paul Miller** have the answers – and reveal that this new machine is possibly the best-value domestic recorder you can buy now.



**S**ix months ago, in *HFC 174*, we heralded Philips's price-busting entry into the CD recording market. The CDR870, priced at just £500, undercut its nearest rival, the Pioneer PDR-04, by £200. Furthermore, the Philips machine offered the additional benefit of handling the new re-recordable CDs known as CD-ReWritable (CD-RW).

During that review our Technical Editor, Paul Miller, identified a flaw in the CDR870's digital recording capabilities (see p13). Prompted by our findings, and much to its credit, the Dutch multi-national went back to the drawing-board to see what amends could be made. The fruit of its labours is the CDR880 pictured on this page. It looks almost the same, carries the same price tag and offers the same CD-RW recording capability. But does it work as advertised, and if so, what do we think of it?

## Rewrite of reply

The new £500 CDR880 certainly looks like a winner. It can record onto the now-familiar blank audio CD-Rs that will play in any Red Book CD player, and cost around a fiver to purchase (see p36 for details of the multiplying brands offering blank audio CD-Rs). Where the CDR880 scores over the competition is in its ability to 'burn' CD-RW discs, which is a rewritable CD format that can be used over and over again — the only drawbacks at present are CD-RW's relatively high price of around £18 per disc, and its lack of compatibility with standard CD players.

To put the price of CD-RW in perspective, remember that the CD-RW disc can be used and re-used thousands of times, while blank CD-Rs may be recorded only once. While on the compatibility issue, Philips is adamant that more and more new CD player designs will be able to play the rewritable disc. (See

*Oasis of Sanity*, *HFC 174*, for more details of CD-RW technology.) And for recording radio programmes, or making temporary trial copies of CDs you might want to buy, CD-RW is a useful feature.

## A DVD diversion

During the listening tests we were intrigued to discover that a 'fixed up' CD-RW disc played perfectly in the Pioneer DV-505 DVD-Video player (*Ear Waxings*, *HFC 178*). This, it would seem, is a fortunate coincidence, since there is no obligation in the DVD-V standard for players even to recognise standard Red Book CDs, let alone exotic new variants such as CD-R and CD-RW. Indeed, to date no DVD-V player has recognised a CD-R disc, which is why we were so surprised by the Pioneer DV-505's playback of our CD-RW recording.

According to a Philips spokesman, the company's own European DVD player, to be launched later this year, will not be CD-RW compatible, though apparently there are wheels in motion to build CD-RW compatibility into DVD-Audio players scheduled for 1999 launch.

## The machine in use

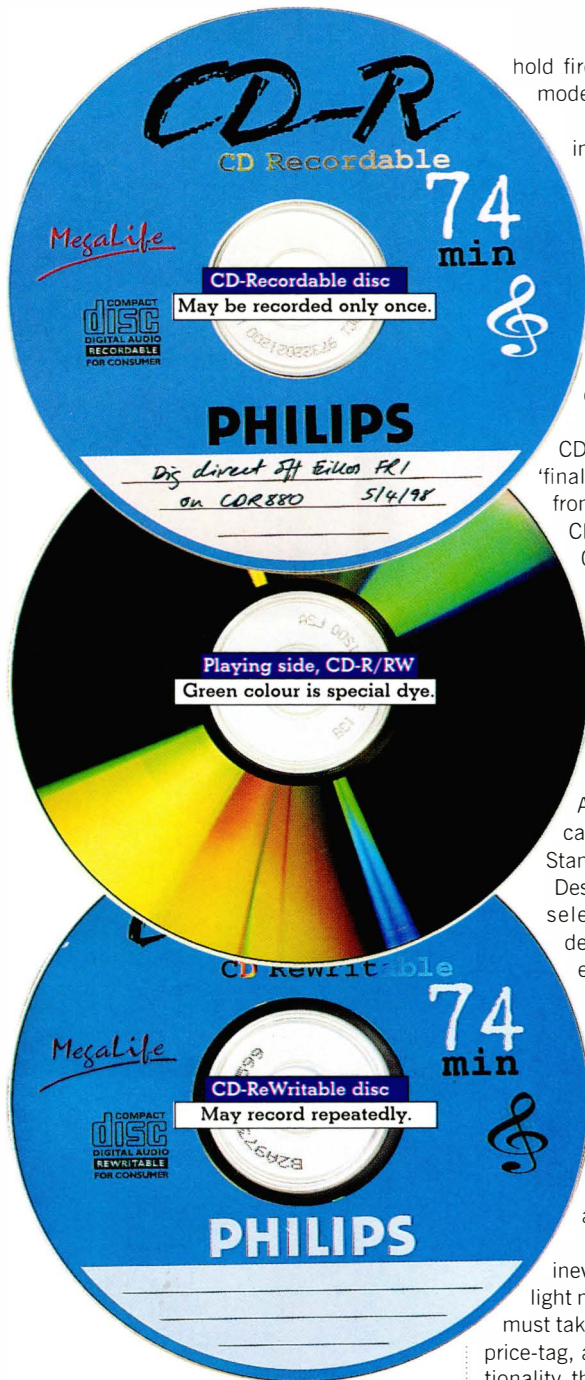
The CDR880 is equipped to record from sources both digital (via optical or electrical interfaces) and analogue (via phono sockets). Naturally it will replay CDs, CD-Rs and

CD-RWs, though as you will read in the lab report, its CD replay performance is in the ballpark of a £200 playback-only machine. The extra £350 pays for the recording laser system, analogue to digital conversion, sample rate converter and control software.

You might think that CD recording is an arcane process known only to egg-heads in white coats. However, the reality is that the Philips requires no more of its operator's brainpower than a cassette tape recorder. Nonetheless, you only get one chance to record onto a CD-R, and if you muff it, the disc goes in the bin. For this reason Philips supplies a blank CD-RW disc with every CDR880 sold in the UK, so novices can hone their digital recording skills over and over before committing to the first irreversible recording on one of the four CD-R discs that are also packaged with the machine.

The CDR880 is certainly easier to operate than its nearest rival, the Pioneer PDR-04 (*HFC 171*). This is because the Philips deck permits use of the handset to change inputs and select the foolproof 'CD Sync' system for direct digital recordings. (CD Sync begins recording as soon as it senses the beginning of a CD's data stream entering the CDR880's digital input.) The Pioneer machine requires that you press buttons on the fascia of the machine itself. Take great care, though, which buttons you press on the Philips remote, since the





handset also provides access to the irreversible finalising process!

When making a direct digital dub, the original CD's track numbers are automatically transferred to the digital 'clone'. When recording from the unit's analogue inputs, the control software will 'listen' for a four-second gap between tracks, and increment track numbers accordingly. Alternatively, you can add track numbers manually using the handset, and this will probably be the preferable option for music with extended quiet passages which might otherwise confuse the software.

### Is it live, or is it Philips?

When we reviewed the CDR870, our plan was to undertake unsighted listening tests to assess the quality of the unit's recordings. Naturally, when that unit's digital gremlins were unearthed, we decided to

hold fire until a revised or replacement model came along.

So as not to prejudice our listening tests in any way, we followed normal HFC practice and completed all auditions before making any measurements in the lab. Our goal was partly to judge the absolute performance of the CDR880, but more importantly to scrutinise its digital copies for evidence of the dreaded jitter.

To do this we compared original CDs with identically recorded 'finalised' copies of the same, made from scratch on both the Philips CDR880 and the Pioneer PDR-04. As both a source and reference replay system, we used the Acoustic Precision Eikos CD player and Eikos interconnects. For monitoring there was a Nagra PL-P preamp, DNM PA-3 power amp and the Wilson benesch Orator speakers (reviewed on p50 of this issue.). Ancillaries included DNM speaker cable and Townshend Seismic Sink Stand supports.

Despite listening to a widely varied selection of musical material, at decent playback levels on revealing equipment, we could discern no tangible difference between originals and copies made on either the Pioneer or Philips. In fairness, one should expect nothing else, but in this instance it proved subjectively that the Philips's CD dubs were not afflicted by same degree of jitter as those made by the CDR870.

Using the CDR880 for playback inevitably cast it in an unfavourable light next to the high-end Eikos, but you must take into account the latter's £2,100 price-tag, and the 880's much greater functionality than an even an expensive regular CD player. Also, as we suggested in HFC 174, the audio playback quality of a single-deck CD recorder is of questionable importance, since most purchasers will surely own a decent CD player already, if they are to transcribe prerecorded CD software onto CD-R in the digital domain. However, if the audio playback quality of a CD recorder is of paramount importance, we'd recommend you spend an extra £200 on the Pioneer PDR-04, which is a more relaxed and confident-sounding machine. (See also *Editor's Notebook* on p3.)

### In conclusion

This is a happy ending to a tale, in which a forward-thinking manufacturer had the precision to acknowledge — and act upon — criticisms made by a small, specialist magazine; and in doing so, move an already ground-breaking product into an unassail-

able market position. Manufacturer, magazine, and consumer all benefit from the unique co-operation that has occurred between Philips and *Hi-Fi Choice*.

The Philips CDR880 is, and will be for a few months, the least expensive CD recording system on the market, and the only one which can use rewritable CDs. Provided it is connected to a CD player with a digital output, and clock accuracy greater than 150 parts per million, the CDR880 will make almost perfect clones of prerecorded CDs. For straightforward music copying — up to 74 minutes' worth — it is the best-value product you can buy today. Home recordists have long dreamed of products such as this, and now those dreams have come true.

## JARGON BUSTER

### What's the difference between CD-R and CD-RW discs?

CD-R stands for CD Recordable. It can be used to record any kind of audio signal, and will store it using the very same technology which underpins the prerecorded discs we have been buying since 1983. CD recorders like the Philips CDR880 can make exact copies of prerecorded CDs onto CD-R. While there is no need to record a complete CD-R all at once, it is not possible to erase any portion of it subsequently.

CD-RW stands for CD-ReWritable. This kind of disc behaves exactly like CD-R, but uses a different physical property of the dye layer. In CD-R, the act of 'burning' in a signal actually melts parts of the dye to represent digital code. In CD-RW, the recording laser beam alters the structure of the dye layer's crystals to represent digital code. All of the crystals can be 'reset' to the blank state, however, which permits the CD-RW disc to be used repeatedly.

### Why are recordable CDs green, not silver?

Both types of recordable CDs are green because they use a special dye layer to store the 'on/off' pattern which represents the digital code of a compact disc. The more familiar silver CDs have their digital pattern stamped into aluminium, hence their colour.

### What is 'finalising'?

While you are adding tracks to a CD-R or CD-RW blank, the recorder stores a temporary Table Of Contents in solid-state memory, to keep abreast of where each track begins and ends. When you have finished recording, if you wish to use the disc in another machine — a portable or in-car CD player, for example — it is necessary to write a Table Of Contents onto the disc's 'lead-in area,' which is situated towards the centre of the disc. This is part of the process called Finalising — the other part is to create a lead-out track, to prevent any disc errors caused by overshoot during a fast search operation.

### What is a Table Of Contents (TOC)?

This is an area at the beginning of the disc which stores information about the location of every track, and its duration.

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"TEAC mini sets standards"

WHAT HI-FI, Jan 97

"All three sources sound big and confident, with an accuracy and delicacy more akin to separates than minis"

WHAT HI-FI, May 97

"In terms of its good looks, the system's asking price could just about be doubled"

Gramophone, Jan 97

Visit your TEAC Stockist for a demonstration or call TEAC on 01923 819630 for more information

500  
TEAC

# You Still Can.

DUE TO TECHNICAL DIFFICULTIES BEYOND THEIR CONTROL, OTHER MINI SYSTEMS WILL NOT BE DELIVERING THIS LEVEL OF PERFORMANCE

Chief Musical Officers' Warning

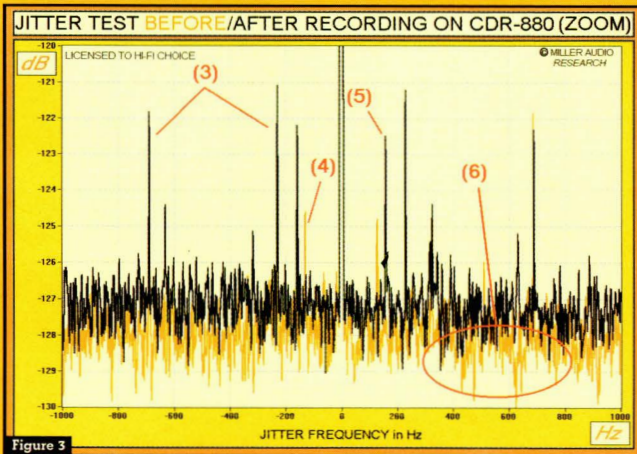
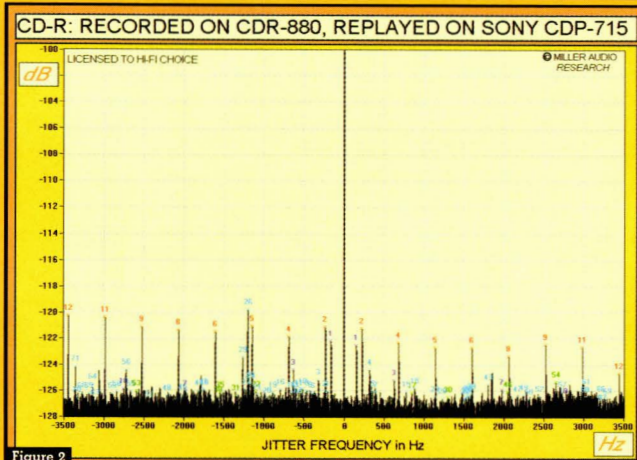
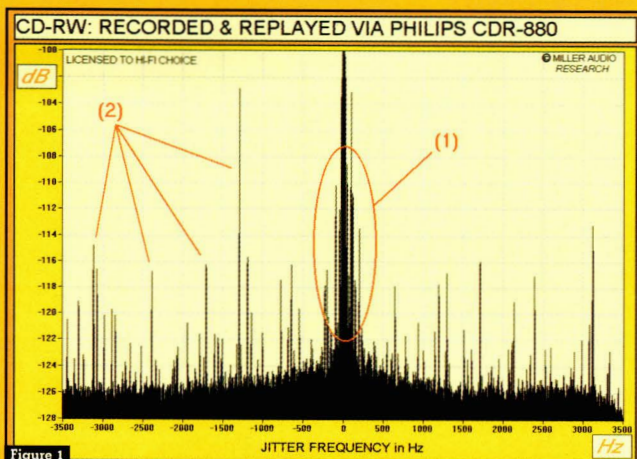
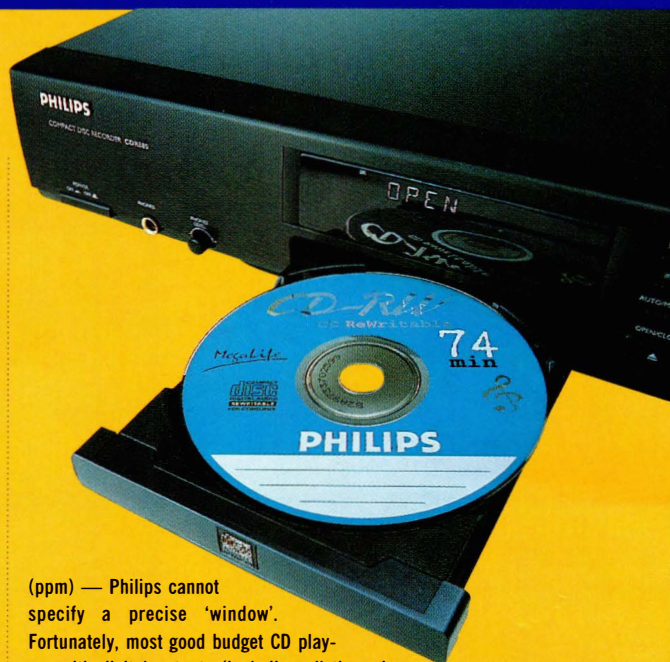
# TEAC

## PHILIPS CDR880 – MEASURED PERFORMANCE

The UK launch, late last year, of Philips' budget-priced CDR870 CD-R/CD-RW machine, was overshadowed by our discovery of a substantial increase in digital jitter compromising the recorder's digital transcriptions onto CD-R discs. This was proved in *HFC* 174. Numerous alternative hi-fi and pro-audio publications failed to hear the clear audible consequences of this jitter, but Philips acted on our information to improve the product as swiftly as possible.

The CDR880 is the fruit of these labours: a CDR870 by any other name, but now equipped with several internal 'work-arounds' to avoid the source of the CDR870's digital corruption.

As suspected, the CDR870's woes stemmed from its sample-rate converter, used to reformat all incoming data to 44.1kHz sampling rate. This should be unnecessary with 44.1kHz sources like CD, so Philips has engineered an appropriate 'dodge'. In the CDR880, any incoming 44.1kHz data is routed *around* the sample-rate converter, so long as its inherent clock error does not exceed  $\pm 100$  to 150 parts per million



(ppm) — Philips cannot specify a precise 'window'. Fortunately, most good budget CD players with digital outputs (including all those in this month's CD test) fall within this specification.

Any 44.1kHz digital source that lies outside of  $\pm 150$ ppm accuracy will still be routed *through* the sample-rate converter before recording; and, as a consequence, will still suffer the jitter that befell recordings on the CDR870. This includes 32kHz and 48kHz sources by default.

As you will see in Fig. 1, the basic performance of the CDR880 as a CD player is broadly unaffected. This plot shows the complex jitter spectrum suffered during the replay of CD or CD-R discs on the CDR-880, with a messy low-rate area (1) to muddy its bass and aggressive high-rate peaks (2) to roughen up the treble. This amounts to 750psec and increases to 865psec with CD-RW discs. A good £200 CD player can achieve 200-300psec.

### Jitter ye not!

And now, without further ado, the moment we've been waiting for: are CD-R copies made on the CDR880 free of the withering jitter suffered by the CDR870?

In short, yes!

As we observed in *HFC* 174, CD-R recordings made on the CDR870 incurred a total of 1600psec of jitter, which is more than sufficient to compromise the sound quality of a budget CD player. This time around, however — as you'll see in Fig. 2 — there was no significant change in the jitter pattern revealed by the Sony CDP-715 CD player (a low-jitter reference) when replaying a CD-R copy of a 'master disc' made on the CDR880. A total of just 151psec (copy) compares very favourably with 141psec (master) and is accounted for by data-induced jitter (134psec vs. 128psec, red coloured cursors) and some 'unknown' jitter (69psec vs. 51psec, purple-coloured cursors).

We can compare the master (orange trace) with copy (black trace) on the zoomed-in view shown in Fig. 3. The data-induced peaks (3) are broadly unchanged but the low-rate jitter seen with the master (4) has shifted and increased slightly in value with the copy (5). Similarly, it's easy to see that the master has a slightly *lower* overall noise floor (6) than the copy (due to random jitter).

### Conclusion

The conclusion is simple. CD-R copies made on the CDR880 will be indistinguishable from the original CDs when replayed on a high-quality machine — precisely what *Hi-Fi Choice's* 'unsighted' listening panel has reported.

For the most part, Philips's 'quick fix' has effectively side-stepped the problems suffered by the original CDR870. Provided your digital source has the requisite clock accuracy, CD-R copies made on the CDR880 will now exceed the quality of all sub-£1,000 recorders.

It's an all-win situation. On one hand, Philips has been spurred into improving a mass-market product to the point where the results will satisfy the most demanding audiophiles. On the other, *Hi-Fi Choice* has demonstrated quite clearly which magazine *you* can trust to deliver accurate consumer reports on new technology!

# The Dealer Decides

Alan Sircom puts himself in our readers' shoes, and visits Grahams Hi-Fi to audition the perfect £2,000 system.

**I**nstant Systems always aims to be a hi-fi dating bureau — gathering the finest hi-fi components, and matching them up with others to produce great-sounding systems. Although we've certainly arranged some glorious hi-fi weddings in the past, sometimes our combinations may prove hard to find within one dealer's showroom, making it difficult for readers to audition our suggested combinations prior to purchase.

So, this month, we've gone straight to that Mecca of hi-fi shops, Grahams Hi-Fi in North London, which is fast approaching its 70th year of trading. Find us a system that sounds

great, we said, and make it one that *Hi-Fi Choice* readers can hear — and buy — easily.

Grahams doesn't stock a massive selection of brands, but prefers to cherry-pick the best components from about 25 manufacturers. Unusually, big names like Audiolab, Mission and Rotel, aren't on the Grahams' roster.

## THE SYSTEM

Rega Planet CD	£450
Naim Nait 3R	£780
Shahinian Compass	£1,395
<b>Total (exc cables)</b>	<b>£2,625</b>



The reason for such a small gene-pool is simple: it makes system creation easier. If a Grahams salesperson has but two CD players, two amps and three speakers available at any given price, there's a real incentive to make sure they sound good together.

Nice idea, but does it work? To test the theory, I asked to hear a CD, amplifier and speaker system, priced at a maximum of £2,000. Furthermore, I told the salesman that I would prefer *not* to spend that much money if possible. I walked through into a soundproof listening room with an '80s-style sofa, and the demo commenced.

### The plan comes together

It began below the price point, with an Arcam Alpha 8 CD player (£520) and amp (£360), hooked up to a pair of Acoustic Energy AE109 speakers (£350). Cables were Linn Analogue interconnects (£4 per metre) and single-wired runs of Cable Talk 4.1 (£4.25 per metre).

My initial reaction was mixed: the sound was powerful, bold and dynamic, but too heavy, dark and broody. So out went the Alpha 8 CD player in favour of the Rega Planet (£450.00).

This was a step in the right direction, thanks to a less cluttered midband and more pristine high-frequency tones. But I still

wasn't satisfied, so we went back to the Arcam CD and experimented with different amps, climbing the Arcam upgrade ladder to the Alpha 9 amp (£500). Another helpful improvement, but still there was too much of inky-black darkness, so there was nothing left but to change the speakers.

My host returned the system to its original all-Alpha-8 state, and substituted the Musical Technology Harrier SE (£425.00) at the end of the chain. This was cleaner in the bass, but the Naim Intro that followed sounded thin and brash. Then we tried the Harbeth HL-K6 (£1,049), a large, stand-mounted classical monitor, which I thought to be very honest and sophisticated in a 'low-volume-level' kind of way.

By now, the CD and amplifier were clearly the limiting factors, so back came the Rega Planet, this time to stay. Hitherto its charms had been hidden beneath a veil of darkness, but with the Harbeth speakers, the Rega's naturalness shone through.

On the amp front, first to return was the Alpha 9, and once again the Harbeth speakers allowed its true talent to shine through. We also tried the Naim Nait 3R (£760), which took me up to the £2,000 mark.

Once I'd heard the sound of the Rega/Naim/Harbeth combination, there was no way I'd countenance spending less than this

amount on a system. Images were wide and deep; the sound was packed with detail and it was musical almost to a fault. Although it lacked a bit of drive with rock music, it was otherwise a superb-sounding rig that I would be happy to own.

### Breaking the £2,000 barrier

Having achieved satisfaction without exceeding that nominal two-grand budget, I decided to crash through it anyway and see what further improvements could be wreaked. We substituted the Harbeths with a pair of Shahinian Compass (£1,395): tall, pipe-like omni-directional enclosures, which behave very differently to all other speakers — either you'll love 'em, like me, or hate 'em. They seemed to cut to the quick of the music, leaving behind all the artificiality so often experienced in hi-fi.

I could have taken another step up to the Arcam Alpha 8SE CD player (£600), and on *ad infinitum* — and if you had heard the Rega/Naim/Shahinian system, you would gladly go the extra £500 without a second thought. If proof were needed, as I was leaving, the system in Grahams' foyer was effortlessly playing some choral music over a pair of laid-back Shahinian Diapasons — and that sounded *really* nice. Should do, for a cool £25,000... ▲



**BECOME A REALIST**—Audio Research delivers true reference sound quality in its **Reference 1 preamp** and **Reference 600 monoblocs**. Each mono chassis packs 16 power output valves through a tightly coupled output transformer to deliver an effortless 600 watt with the naturalness and ease of dynamics only associated with live performance. With its wide bias adjustment the Reference 600 can use of any popular output valves in the 6550, KT88/90/99/100 families. The all-valve Reference 1 stereo line preamp has full microprocessor remote control of volume, balance, record and input selection with both balance and single ended inputs (eight plus full tape loop) and outputs (two main, one tape). There are no mechanical switches to degrade the signal path. Awards and world-wide acclaim says it all. Find out for yourself why Ken Kessler rated these “*the finest audio amplification devices ever produced*” (Hi-Fi News May 1996)

**REAL CLASS**—Audio Research has introduced the **LS9**, a remote control solid-state preamp to replacing the popular LS3/3B. This all new, direct-coupled Class A design uses the constant-current technology of the flagship Reference 1 and features two balanced and three single-ended inputs plus a full tape monitor loop in a low profile case.

Perfect partner for the LS9 is the new **100.2** solid-state power amp which we believe sets a new standard. Liquid and grain-free it possesses a fine midrange transparency.

**REAL TRADITION**—Audio Research has kept the faith with vinyl and has finally produced the no-compromise **Reference 2** phono stage. Various cartridge EOs — RIAA and 78 — are provided with front panel gain control, balanced or single ended working and remote control.

Enthusiasts looking for the traditional qualities of an all-valve line pre-amplifier will find them carried over into the **LS8** which replaces the LS7.

**REAL PERFORMANCE**—the **LS15** preamplifier caters for those making an important transition into the real high-end yet who want to retain the convenience of full remote control of all front panel functions. It offers both singled ended and balanced inputs with microprocessor controlled relays for gain control and switching.

**REAL POWER**—The 100 watt per channel **VT100 power amplifier** is a hard-driving amplifier with true bass slam matched by a liquid mid and top. Its speed and control have to be heard. The LS15/VT100 pre/power combination will rock you back on your heels with its resolution and dynamics.

# BECOME A REALIST



**Reference 600 monoblocs** — winner AAHEA Golden Note award 1996 'Best tube electronics design'  
**Reference 1 preamplifier** — winner AAHEA Golden Note award 1997 'Best tube electronics design'

This is the partnership to put excitement back into your music making. Martin Colloms (Hi-Fi News April 1997) reviewed the VT100 as “*having a generously balanced sound...sufficiently positive and dynamic to give a believably accurate tonal balance*”.

The VT100 is a mid-power amplifier positioned between the classic VT50, at around £3300, and the mighty VT200.

**REAL PRAISE**—the all-valve **LS22** brings down the cost of true **Audio Research** high-end performance.

This line stage preamplifier was reviewed in March 1996 (Hi-Fi News, Martin Colloms) as “*a truly first-rate line controller. The LS22 performed as flawlessly on the lab bench as it did in the listening room. (the LS22) proved uncompromising in its closest approach to the absolute—a neutral, transparent, musically honest gain control.*” The review concludes: “*a work of reference, universal in application and a tonic for any system. In my opinion it's the best mixed mode pre amplifier I've heard to date and in view of what it achieves, the price is nicely competitive*”.

**REAL INTEGRATION**—enthusiasts waited a long while for the **CA50** all-valve, remote control integrated amplifier. Conservatively rated at 50 watt per channel the CA50 was designed to be stunningly musical, handsome in appearance—its styling cues come from the awesome Reference 1—and completely convenient. Join the queues waiting to audition this important **Audio Research** first. As Ken Kessler (Hi-Fi News February 1997) said, “*So much for the superiority of separates...*”.

The CA50 is styled to match the CD2 Compact Disc player. **REAL QUALITY**—An entirely new full 20-bit **CD player**, the **CD2**, replaces the single box CD1 and CDT1 transport. As a complete player **Audio Research** is convinced the CD2 can compete with any single or two-box player in the market with its astounding resolution of detail and dynamics.

For those seeking classic Audio Research sound quality ideals in an outboard digital converter the all valve-output **DAC3** converter is the perfect choice. The DAC3 — now in **Mk II** production with improved components and important mechanical improvements to reduce vibration — is joined by the entry-level **DAC5** converter.

Time you became a realist?—contact **Absolute Sounds** for full information and a list of dealers where you can experience musical reality of **Audio Research**.



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# Ear Waxings

Is something holding back the sound of your system?

Here's **Jason Kennedy** with a selection of liniments to ease sonic suffering.

**U**nfortunate hi-fi truth number 2,478: at all but the most stratospheric price levels, all audio equipment is compromised to a greater or lesser degree. The manufacturers' need to stay within strict budgets affects every aspect of construction, from electronic components to the quality of casework and power-supply regulation. However, while there's not much that a layman can do 'after-market' about resistors, capacitors and integrated circuits, he (or she) can alter aspects of mechanical isolation and mains power supply integrity, to extract the last ounce of sonic performance even from relatively prosaic pieces of hi-fi equipment.

Take the Pioneer DV-505 DVD player I discussed last month. Its case is lighter than that of most £450 CD players, thanks to a switched-mode power supply which requires only a minimalist transformer. There is very little damping for airborne and transport-created vibration. This lack of mass is not entirely deleterious, since the lighter a box, the less energy it can store. But at the same time, to deaden a box with some 'intelligent mass' can yield benefits to sound quality.

## Absolutely slabulous

Cue the £189 Generic Slab from Acoustic Precision, maker of the fabled Eikos CD player. Essentially the Slab is a sheet of mineral-loaded polymer, a self-damping material used to build Electrofluidics loudspeakers. This sits on four 'pneumatic spheres' (squash balls as they are better known); and the combination of ball and slab creates a sprung mass which, if attached to a component of suitable weight, will provide an energy barrier, at the sort of frequencies which will usually excite resonance in an equipment support.

The Generic Slab is a freestanding version of the 'base' fitted as standard to the Eikos CD player. Since the latter sounds so good, the 'slab at large' deserved a fair hearing. Using Blu-Tack I attached it to the bottom of the DV-505, first removing the unit's feet to obtain maximum bonding. The results, even with the unit already comprehensively isolated on the air-decoupled Townshend Seismic Sink Stand, were impressive. The sound took on more substance, and extra focus invested the music with material energy and power.

On a more conventional Wilson benchesch



Acoustic Precision Eikos Its enhancing Generic Slab base is now available as a separate item.

support focus was the key gain: there was less muddle, more depth and impact, plus better timing. The slab let the player resolve subtlety with a little more precision; and consequently, less tangible elements like imaging begin to take shape.

## Splice the mains brace

Even with superlative mechanical isolation, no component can give of its best without a clean mains supply. The name of Acoustic Precision crops up once again here, thanks to its Black Box 'mains conditioner' that has proved effective with previous CD players in my system. It is priced at £149, and doesn't appear to cause the negative side-effects that have dogged devices of this type in the past. However, it is only suitable for low-power applications that consume less than 50 Watts.

Using the Pioneer DVD machine as guinea pig once again, I found that its sound was affected as much by the Black Box as by the Generic Slab. The Box relaxed the presentation and added depth while improving timing — a combination of effects very few tweaks can achieve. It also added weight and dynamic variety.

Could I gain further improvements with a more exalted mains lead? I dug out a Russ Andrews Accessories power lead, terminated in the appropriate 'Telefunken' figure-eight plug. This is an old 4TCM sample which is now available in slightly chunkier form at £65, while a less aspirational variant can be found in the company's rather gaudy Yello

range, priced at £19.95. (All new subscribers receive one of these as a free gift — see p46 for subscription details —Ed.)

The 4TC lead effected further degrees of refinement when inserted between the AP Black Box and the DV-505, sharpening focus, adding impact and substance.

Finally I deployed a ferrite collar, a clamp-on device sold by Tandy and TDK, among others, for about £5. This helps to remove radio-frequency (RF) noise from any type of cable — open up a modern CD player and you'll find one of these, in some shape or form, to prevent the egress of too much RF from the player's microprocessors.

In my experiment it wreaked a subtle but repeatable effect on high frequencies, making them more open and clean, permitting small percussion bells, for instance, to sound more realistic.

## Was it worth the while?

The combined cost of these tweaks is approximately £300 — perhaps a little excessive for a £450 product like Pioneer's DV-505. However, since every enhancement contributes in its own right, you could try them individually — and you could supplement the effect of the Generic Slab, for example, by glueing portions of car soundproofing material inside the player's lid. (Subject to the usual caveat that by opening the player yourself, you would invalidate any manufacturers' warranties in force at that moment.)

Merry experimentation to you all! ▲

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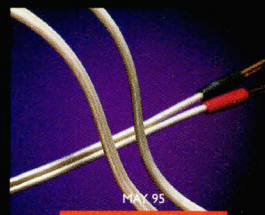
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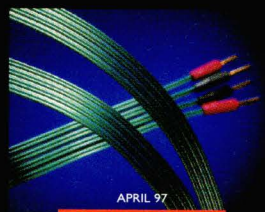
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# The Jimmy Hughes Experience

Wouldn't it be wonderful if one component could transform a so-so system into a super system?

Alas, says **Jimmy Hughes**, true audiophiles must be prepared to exercise a little more patience. . .

**T**he world is full of hi-fi enthusiasts who hope to miraculously transform their systems simply by replacing a single component — CD player, amp, speaker, whatever. I know all about this, having experienced the phenomenon at first hand recently, when an old friend, Mike, asked for advice about upgrading his system. He heard my set up, liked it enormously, and wanted similar results in his home. Within reason, money wasn't a problem — providing the improvements were tangible, he'd stump up. But where to start? (Some parts of his rig date back to the 1970s.)

For years now, Mike's been in a no-win situation. He has been unhappy with the sound of his system, but hasn't been able to work out why. On moving house, he went to the trouble of dedicating one room to hi-fi, but this didn't solve the problem. He's compared various pieces of exotic hi-fi with his own equipment, yet no treatment has effected a cure. Now, having retired, he wants a system he can really enjoy.

When I listened to the sound of his gear, I felt his '70s-vintage Spondor BC-3 speakers were imposing the greatest limitation, and to a lesser degree, so was a Beard pre/power amp combination from the '80s. The system had a reasonably natural tonal balance, but dynamics were squashed and the bass sounded wooden and boomy. Clarity wasn't great, either, with loud instruments and voices tending to blot out quieter ones. Overall, the music sounded shut-in and cramped, lacking freshness and brilliance.

I brought along a new amplifier and speakers, and felt pleased with the improvement. The music had good internal separation and a wide dynamic range. Clarity was much improved, so that loud sounds no longer dominated. Mike seemed delighted — but when I spoke to him a week or so later he was having doubts. Yes, it did sound better. But he wanted a bigger difference.

## Better — and bigger!

Mike felt that although the new amp and speakers were superior, they were not wreaking enough of an improvement to warrant paying money for them. I could see his point, but for me, the important thing

was the nature of the improvement rather than its magnitude. I wanted to create a foundation on which to build: a solid floor providing a platform for further changes.

The next stage in my plan would have been to replace the speaker cables and interconnects, put in some Kimber mains cables and mains distribution blocks, and add a sub-woofer. Sadly, we never got that far, since it was clear that Mike was looking for a 'miracle' improvement that would transform the sound of his system at a stroke. Because the new amp and speakers hadn't induced the desired shaft of sonic lightning by themselves, clearly they weren't up to the job.

Ironically, the EAR 859 integrated amplifier I installed for Mike was absolutely outstanding. For sheer naturalness, the 859 is hard to better. It has a big sound, and I was amazed at the way it drove the BC-3s. It sounded gutsy and dynamic, yet sweet and natural. When Mike rejected it, I was glad, and decided to buy it myself!

If I think about my own system in this context, it's impossible to say what creates the overall impression of the sound. Lots of elements contribute to the picture. However, when visitors ask me about the magic ingredient, sometimes, rather stupidly, I attribute the quality of my sound to my latest enthusiasm — perhaps a different cable, or a new amplifier. In truth, this is a naïve claim.

## Little steps to hi-fi heaven

Upgrading in hi-fi is rather like walking towards a distant object. You can take many steps in the right direction without appearing to get any closer to the destination. You need to have the faith to carry on — eventually you'll reach your goal.

It is not impossible to hugely improve a hi-fi system simply by replacing a single component. However, most systems only reach the apogee of performance only by a series of small but important victories, rather than a single knockout blow. The difficult part is being able to consistently discern the effectiveness of each small step along the way, and to recognise a positive step forward even when a perceived improvement seems minor.

Sometimes, you can change two or three elements without yielding much of an obvious improvement, then the next change produces a breakthrough. It's tempting to ascribe every improvement to the last change made, as though previous tweaks didn't count. But it's likely that the last change was a catalyst that held open the door and permitted all of the preceding improvements to register fully. A reliable test is to undo earlier changes you have made to your system — you may find that earlier differences are more significant than they seemed at first.

When a system sounds great, it seems so natural and right. When it sounds bad, it's harder to say what's wrong, and why. Yet this is the time when you must pay most attention to thinking about which improvements are needed. The simple solution is to make lots of changes at once, rather than trying to hear the effect of each one individually. But this presupposes that you know which changes to make — and have sufficient spare cash to buy all of the desired equipment!

To sum up: there are no quick fixes in hi-fi, no panaceas. There's no magic component out there waiting to transform your system. Sonic success depends less on one part of a system performing spectacularly well, and rather more on the user effecting a state of synergy between all of its components. ▲



# Paul Miller's Oasis of Sanity

Some Watts are more equal than others. Paul Miller sets the record straight about amplifiers and loudspeakers, then moves on to questions of phase.

To judge the capacity of an amplifier, by advancing the volume level until distortion is heard, assumes that it is the amplifier and not the speaker that has reached its limits. In practice, just because a speaker is rated at, say, 200 Watts, does not guarantee that its acoustical output will increase in smooth proportion with amplifier power up to 200 Watts.

In fact, the speaker may well have reached its 'end stops' at 100 Watts, but will still dissipate another 100 Watts of power as heat and distortion without incurring damage. Importantly, however, neither will there be any significant increase in output sound pressure level (SPL). This is precisely what Paul Messenger observed in his Personal Messages column of *HFC 177*, based on the results of SPL measurements made with his hand-held meter. And it was despite the fact that the speaker may well have been dissipating 100 Watts from the Naim NAP135 and upwards of 250W from the MF. The simple expedient of measuring the voltage across the speaker terminals would have proven this.

It is fundamental that progressively increasing the power input to a loudspeaker will not necessarily be rewarded with a proportional increase in acoustical output.

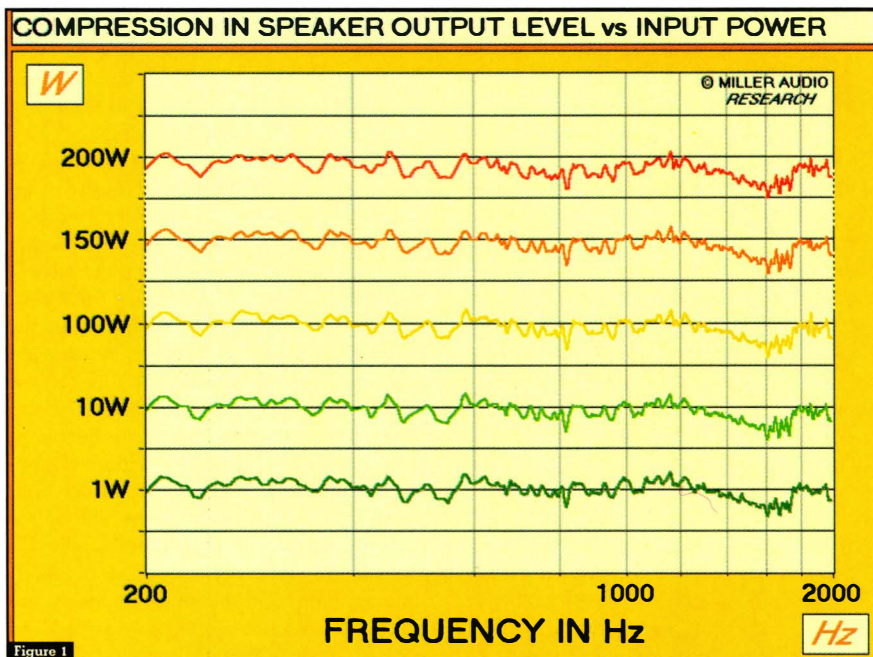


Figure 1

### Watts in vain?

Figure One shows the acoustical output of a loudspeaker, rated at a nominal 200 Watts, when fed a dynamic signal between 200Hz and 2kHz. I configured my computer signal-

generation program to filter out any sub-200Hz signals, to avoid large low-frequency (LF) cone excursions. If the speaker was able to increase its sound pressure level in proportion with input power (or Volts, to be precise), then each response curve would cut directly through the horizontal lines adjacent to its markers for one Watt, 10 Watts, 100 Watts and so forth.

In practice, we see that the responses at 100 Watts and 150 Watts are dropping slightly below the line (a sign of compression), while at 200 Watts, the speaker's mean output is sagging by some 1.25dB (each horizontal division represents five dB). The difference in level between 150 Watts and 200 Watts is also 1.25dB, proving that such an increase in power into this speaker would be completely wasted. Indeed, even with the computer-generated signal used to undertake this test, the speaker's output was audibly distorted at 200 Watts, while the test amplifier was still capable of advancing its output beyond 300 Watts.

This demonstrates that, all other things being equal, a 200 Watts amplifier is more powerful than a 100 Watts amplifier — but is only more *useful* if your loudspeaker can convert those extra Watts into greater SPLs!

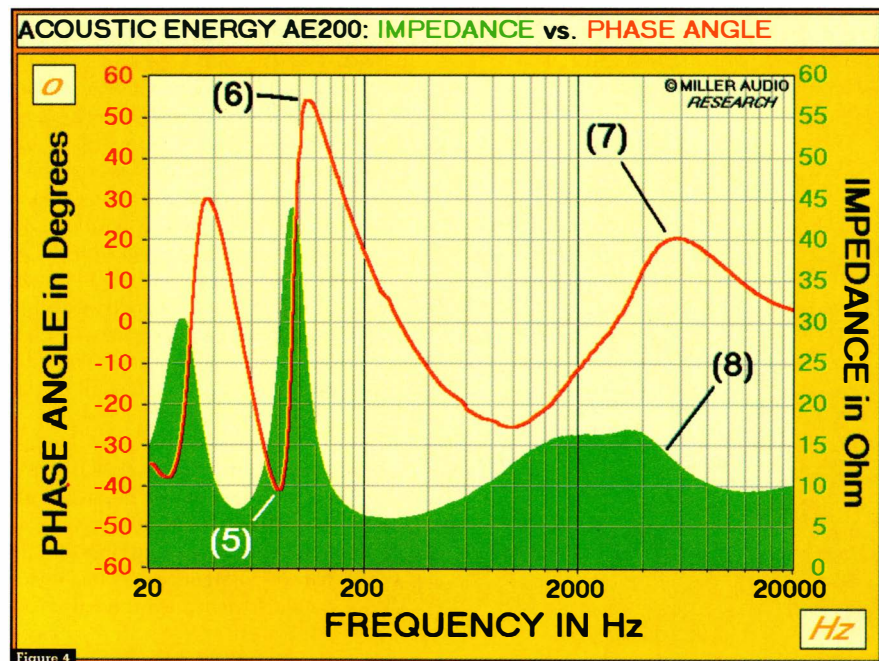


Figure 4

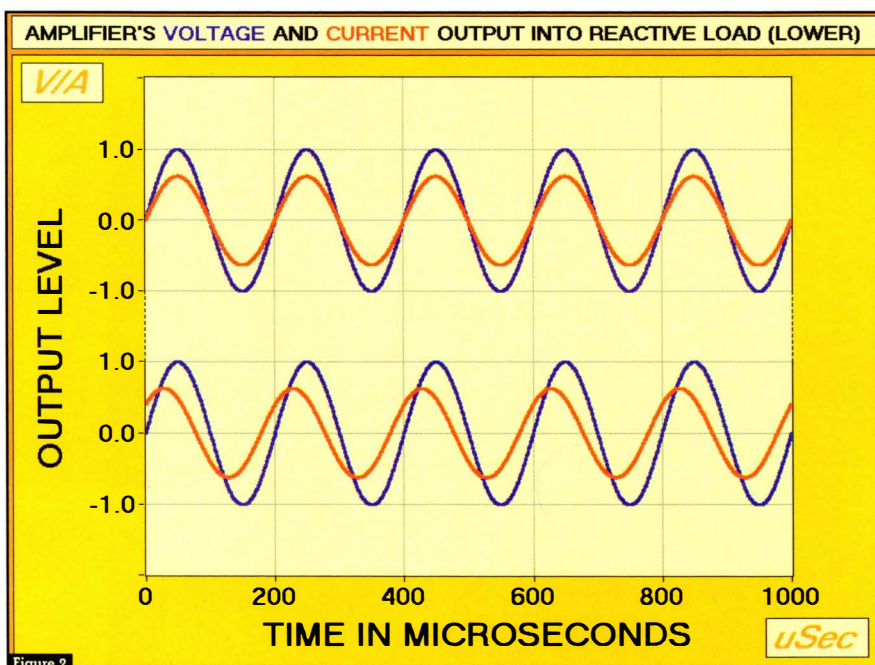


Figure 2

**Just a phase they're going through...**

So how far is a 'real-world' loudspeaker removed from the simple eight Ohm and four Ohm load resistors typically used in laboratories to test amplifiers? In practice, the amplifier is faced with a load impedance that can swing from, say, many tens of Ohms to just a few Ohms — all courtesy of reflexport and driver resonances, crossover networks and bass/treble driver coils. The net result is a mixture of inductance and capacitance, leading to a so-called *reactive* load that the hi-fi amplifier must deal with.

Figure Two shows our amplifier producing a five kHz sinewave. Each complete cycle lasts for 200 microseconds (0.2msec, or 0.2 thousandths of a second). The upper plot depicts our amplifier driving a purely resistive load, like the eight and four Ohm

resistors typically used to define power output specifications. Here, the voltage (blue) and current (red) waveforms are not at the same 'level': a one-Volt output would require 0.25A of current into a four Ohm load, for example. Nonetheless, current and voltage are still clearly 'in phase' with one another.

Asked to drive a *reactive* load, like a real loudspeaker, and we observe a phase shift between the respective voltage and current components of the amplifier's output at 5kHz. A positive phase angle exists where the output current leads the output voltage, and vice-versa for a negative phase angle. In this example, the current lags the amplifier's voltage output by 22 microseconds, amounting to a difference of 40 degrees. We would say that, at five kHz, the loudspeaker load exerts a phase angle of -40 degrees.

This phase angle places greater strain on the amplifier's output stage, which typically becomes less efficient and dissipates more heat. If a substantial phase angle happens to coincide with a dip in the speaker's impedance trend, then the amplifier may fail to achieve its rated output power. In exceptional circumstances, gross distortion may result, and/or the amplifier's protection circuitry may be triggered.

**A challenging load**

Let's study this effect in practice, using two of the speakers featured back in *HFC 177's Oasis* column. Illustrated in Figure Three, the Dynaudio Audience 5 is known to be a taxing assault course for the toughest amplifiers, since there are dips in its impedance trend (shaded green area) below four Ohms at 200Hz and 8kHz (1), and the *average* impedance is just 5.2 Ohms across the entire audio band. Nevertheless, the phase angles presented by this low-impedance load are not particularly extreme.

At bass frequencies, there's a dip down to -16 degrees (2), due to the speaker's LF resonance, before a swing back up to just under +25 degrees (3). This is the maximum phase angle presented by the Dynaudio across the audio range, and occurs at an impedance of 6.5 Ohms (4) at almost precisely 100Hz. A strong bass note, whose fundamental lies very close to 100Hz, will probably constitute the toughest musical test for any amplifier connected to the Audience 5.

**Driven to distraction**

By contrast, as illustrated in Figure Four, the under-damped low-frequency behaviour of Acoustic Energy's little AE200 actually promotes a more substantial swing in phase angle. Incidentally, do note the expanded phase and impedance scales on this graph. In this case, the inductive (negative) to capacitive (positive) swing, from -41 degrees (5) to +55 degrees (6) respectively, occurs over a very narrow 80Hz to 105Hz bandwidth. This is unlikely to improve the chances of a clean-sounding bass register with a less-than-tolerant amplifier, despite the fact that, over this band, the speaker's impedance never falls below an easy 20 Ohms.

Between 200Hz and 2kHz, the inductance of the bass driver's voice coil prompts a gentle rise in the impedance (shaded green), after which the treble crossover introduces a capacitive phase angle of +20 degrees at 5kHz (7). This looks pretty harmless, however, because it coincides with a 'safe' 14 Ohms impedance (8).

All of this shows the importance of examining a speaker's load to determine the frequencies at which low impedance and wide phase angles occur. Where the two coincide, the current and voltage demanded of an amplifier are shifted out of phase and, potentially, out of sympathy with the music at hand!

Do you have a subject matter for the Oasis? Please contact P.Miller via E-mail on 100576.3021@compuserve.com

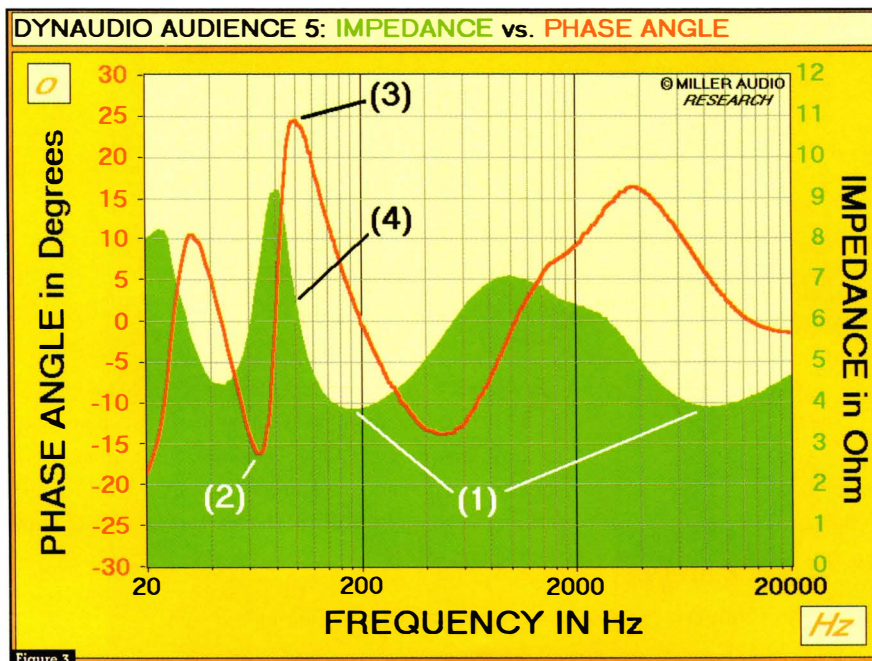


Figure 3



## THERE ARE SPEAKERS, AND THERE ARE GREAT ORATORS...

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# Personal **Messages**

Paul Messenger is still trying to work out whether he wants a louder hi-fi experience – or a sweeter sound . . .

**N**o surprise, really, that my column in *HFC 177* stimulated some discussion. I had identified an apparent discrepancy between amplifier power ratings and the real-world loudness levels they can generate. Musical Fidelity's Richard Ansell (*Write on*, pp24-25) accuses me of "a number of errors", so I'd better scratch a little further below the surface. (See also Paul Miller's *Oasis of Sanity*, pp20-21, and my editorial column this month –Ed.)

I still defend the idea behind my investigation. I'm sure that most people who buy higher-powered amplifiers do so in the hope of satisfying a lust for loudness. Will their investment in Watts be repaid with an increase in dBs?

I certainly wasn't intending or attempting to have a pop at Musical Fidelity, but because I'd tried two different pairs of speakers with high power handling capacity, and obtained broadly similar results with both, the finger of suspicion seemed to point logically at the amplifier.

Richard Ansell suggests that the speakers may have been the limiting factors, while my investigations indicate I might have been too hasty in blaming the amp. One thing's for sure: this affair has served to reinforce the fact that the amp/speaker interface is extraordinarily complex. (See again pp20-21 –Ed.)

## Once more unto the breach

Two more pairs of speakers with ample power handling have since been delivered chez Messenger. One will be tested formally in next month's issue, but both arrived in time for some more power tests.

Dynaudio's new Contour 3.0 (£2,930) is an outstandingly refined example of an upmarket compact floorstander. It is a genuine three-way design with similar characteristics to the company's less expensive models: namely an exceptionally neutral overall balance and midband transparency, together with a combination of fairly low sensitivity and considerable low bass weight.

The other speaker is an entirely different kind of animal — an apt word to describe JBL's PA-style SVA2100 (£1,250). This looks three times as big (and three times as ugly) as the Dynaudio, but costs less than half the price. It deploys two large, 10-inch-frame bass/mid drivers either side of a large, pro-style, horn-loaded tweeter, while its enclosure is loaded by two very large ports.

Surprisingly, given that these two speakers sound so very different from one another, the JBL delivers a similar room balance to the Dynaudio. However, its sensitivity is at least 5dB higher, and the in-room averaged trace is significantly less smooth.

On repeating the same power test as I undertook last month, the Dynaudio gave broadly the same results as before; indeed, on one track the lower-powered Naim NAP135 amp actually gave a marginally higher measured SPL (sound pressure level) prior to overload than the Musical Fidelity A1001.

However, the JBL proved that more power really does translate into higher SPLs: it registered a comfortable extra 4-5dB when driven by the Musical Fidelity amp in place of the Naim. Ironically, the only speaker of the four (Audio Spectrum Xanadu and Wilson benesch A.C.T. One from *HFC 177*; Dynaudio and JBL this month) which proved capable of taking full advantage of the more powerful amplifier, was also the most sensitive model (ie the one which goes loudest for a given amplifier input). The JBL result certainly implies that speakers can be the limiting factor.

## Rate expectations

Amplifier manufacturers might enthusiastically parade their power ratings, but speaker builders are altogether more cautious. French brand Cabasse, whose Farella 400 will be another design featured in next month's review, is one of the oldest and best respected speaker designers in the business. It quotes a modest 100 Watts 'Nominal Power Rating' (to the DIN 45573 standard) for the speaker in question, and goes on to state: "It is important to note that the loudspeaker can handle peak powers approximately seven times

higher than the figure given."

A speaker designer has the unenviable task of juggling with the variables that define a particular model's performance. In turn, said boffin must cope with individual customers' tastes in music and listening levels. Furthermore, the spectral content of music — that is, its blend of frequencies — varies dramatically between musical genres. And at the same time the genres themselves are constantly evolving.

To address this very point, Rega has just launched a new floor-standing loudspeaker called the Jura, which is larger than the company's longstanding and slightly more expensive ELA, and has a bigger (seven-inch-frame) main driver. A major rationale for the new model has been to reflect the changes in music that have occurred over the past decade. Modern dance material now demands the sort of low frequency weight and power handling that can leave ELA's five-inch main driver struggling, even though the older model's sweeter midband is still favoured for acoustic music.

More powerful amps can supply louder sounds under the right circumstances. With the Musical Fidelity amp, the JBL produces 10dB of loudness more (almost four times as much) than the smaller, more expensive Dynaudio design. However, the latter's relative smoothness unquestionably results in a far more satisfying all round hi-fi experience. Conclusion? The grand old hi-fi fairground of swings and roundabouts is still in business... ▲

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# Write on!

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## LETTER OF THE MONTH

### Live in the air age

In a recent article I read that, in theory, the best mechanical isolator for a hi-fi system would be a bag of air. I've discovered a very cheap way of applying this principle, which might save us working-class peasants a few hundred quid. It has transformed the sound of my system: more detail, increased articulation and simply more realistic reproduction.

It's all down to bubblewrap: ready made airbags, which can be cut into any shape required. All I've done is cut eight two-inch-square pieces and placed two under each corner of my Marantz CD-63mkII CD player, to double their thickness and thereby increase the isolating effect. I suspect more layers would increase quality still further.

C Redmond, Bacup, Lancashire

Stan Vincent replies... Budget tweaks are beautiful tweaks!

### I don't believeeeeee it!

Over the years, I've attempted to adjust innumerable switches so that the knob indicators show exactly what is being selected or adjusted. I do not recall a single one that was accurately positioned.

On page 18 of HFC 176, there was an advertisement featuring the prestigious Marantz PM-66 KI Signature amp beneath a portrait of the reputed perfectionist tweaker. His perfectionism evidently does

not extend to the presentation of his products. In the picture, the indicator dot of the selector switch lies almost half-way between Phono and CD. Which of these sources are we to assume is being selected?

Peter C Jowsey, Aberdeenshire

### A clip round the ear

The subject of Paul Messenger's article *Personal Messages* (HFC 177) was an attempt to compare the maximum loudness (and hence, dynamic range) of a hi-fi

system, with different manufacturers' amplifiers in place.

However, when doing such a test, it is obviously important to note which component is clipping or limiting first. Paul Messenger's method appears to have been to turn the system up until it was just at the onset of audible clipping, then back off the volume slightly and make a sound pressure measurement.

In fact, in his words, the clipping heard was caused by "the bass cone bottoming out". He appears not to have realised that in this circumstance, the speakers used are obviously the limiting factor and, therefore, he should not have been surprised when he measured no difference in level between Naim NAP135s and our own A1001 amplifier.

In order to perform a true comparison, it would be necessary to use speakers that are capable of handling at least the 275 Watts output (specified into an eight Ohm impedance) Ohms of the A1001. He would then measure the approximately 5-6dB greater dynamic range that the A1001 would give over the NAP135s in this system.

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Speakers are generally rated in terms of nominal power handling, which takes into account the fact that music signals do not contain the same energy at high frequencies as they do at low frequencies. At the latter, the maximum cone excursion of the woofer is usually the limiting factor, while at higher frequencies the limiting factor will be the thermal limit of the voice coil. Thus, the spectral content of the music used will also affect the point at which the speaker limits.

All these effects are, however, to do with speaker design, and not the amplifier used, and so the comments on amplifier

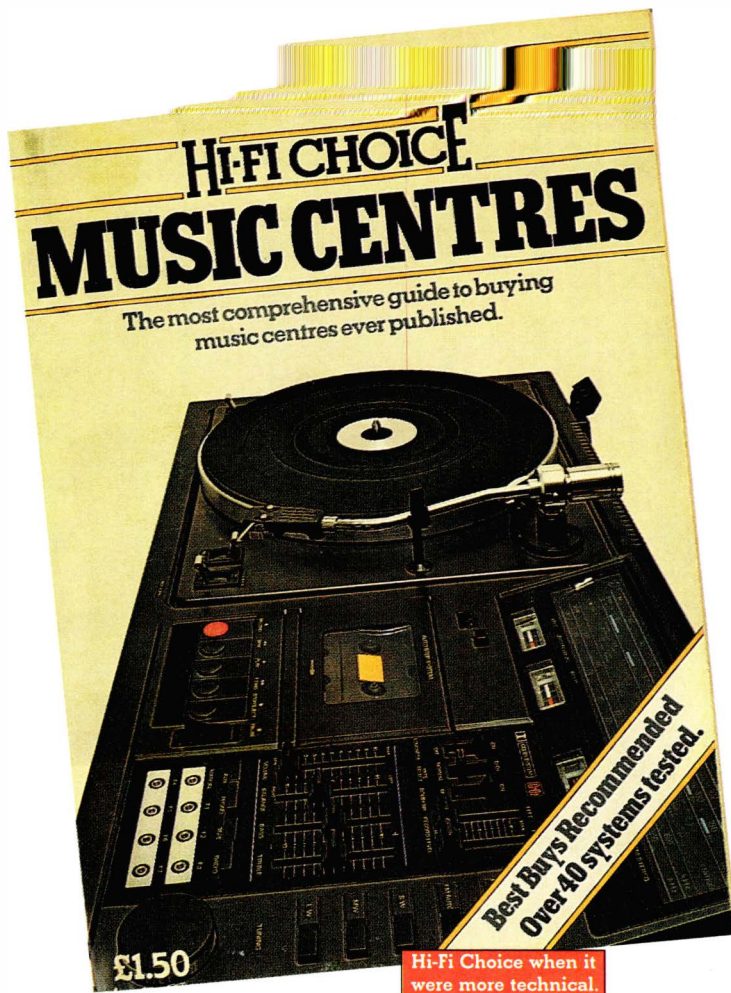


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power ratings are unjustified. In our opinion, the reason that powerful amps often sound better than low-powered models is usually because of the greater headroom they offer. Greater headroom allows compression-free, distortion-free reproduction of the fleeting transients in music, which are often higher in level than the average signal.

Or have we missed the point entirely?  
*Richard Ansell, Technical Director, Musical Fidelity Ltd, Wembley, Middx.*

*Stan Vincent replies... Paul's experiment with Naim and MF amplifiers was well-meaning, but as he acknowledged, "not scientific" and, alas, based on an incomplete appreciation of the interaction between amps and loudspeakers. Paul Miller, having begun an investigation into this matter in HFC 175, this month publishes further results of his research, to be found in his Oasis of Sanity column, (p20). I believe the latter definitive pronouncement sets the record straight about the 'usability' of amplifier power. Technical stuff, indeed, but interesting!*

**American dream**  
 I buy your magazine here in the US, mostly for the excellent

reviews and the *Help* section. What's frustrating, though, is trying to correlate the models you review with the ones available over here. Would it be possible for you to mention which US model is the same as the one you review? I imagine the US is not your major market, but I think this could really expand our interest in your magazine.

It's so frustrating to compare your high level of straightforward advice with what we get here. I've written in to magazines here in the US to get specific recommendations on how I could improve my system, but the only response I get is that they don't have the time!  
*C. Coday, Huntsville, AL USA*

*Stan Vincent replies... As far as I am aware, most British specialist brands' products will be the same on both our shores. The only difference will be that they are equipped to handle 110V/60Hz mains voltage. In addition, there is a sort of a Brit-fi 'underground' movement in the States, spearheaded by independent publications such as The Listener.*

**Is ignorance bliss?**  
 Are you serious in thinking that the majority of *Hi-Fi Choice* readers cannot understand technical findings? (*Write on, HFC*

177) If this were true, the answer is education, not dumbing down. The current bar graphs are totally meaningless and a waste of space. They do not crystallise the brilliant findings of Paul Miller and will confuse and hinder the understanding of non-technical readers.

Also, you are insulting your readership by producing a lowest-common-denominator magazine and dismissing the rest as egg-heads and tech-buffs — which we are not. If the magazine's audience was truly generalist, you wouldn't bother reviewing high-end hi-fi, or even products costing over £500. But you do.

You used to provide far more detailed information and articles, essential to any review, back in the AS days. Putting technical information on the Web site is not a solution, as the majority of your readership will not have access to it. The solution is to extend Paul's superb, informative graphics to the rest of the magazine and get him to write educational articles explaining what's going on.  
*TG Nattress, Belmont, Durham*

**Beauty is only box deep**  
 Pioneer has graced its NS7 and FX Series mini systems with a great degree of simple elegance. Yet the same company's Precision units look lumpy and aesthetically lacking by comparison. And hi-fi is increasingly part of the furniture of a room, with elegant fittings and housings often taking place of the untidily scattered boxes and cables.  
*Mrs E Crews, Thetford, Norfolk*

*Stan Vincent replies... My wife would certainly sympathise with Mrs Crews; many audiophiles would brand this a stereotypical reaction of women to hi-fi. But is this just prejudice? Editorial Assistant Charlotte Ricca investigates the subject this month on page 33.*

**Constant craving**  
 I think even good analogue tape sounds better than 16-bit CD. I appreciate CD's attributes, but a smattering of crackle or static is immaterial to me. My ears crave the continuous image that analogue provides. Even the world's finest DAC surely has to

do a dot-to-dot act, guessing at the sound between samples.

We shouldn't be so surprised that higher-resolution digital sound formats are on the way. But it's reassuring for us reactionaries to know that LPs pressed from analogue master tapes have the equivalent of infinity bits.  
*James de Beresford, Farnham, Surrey*

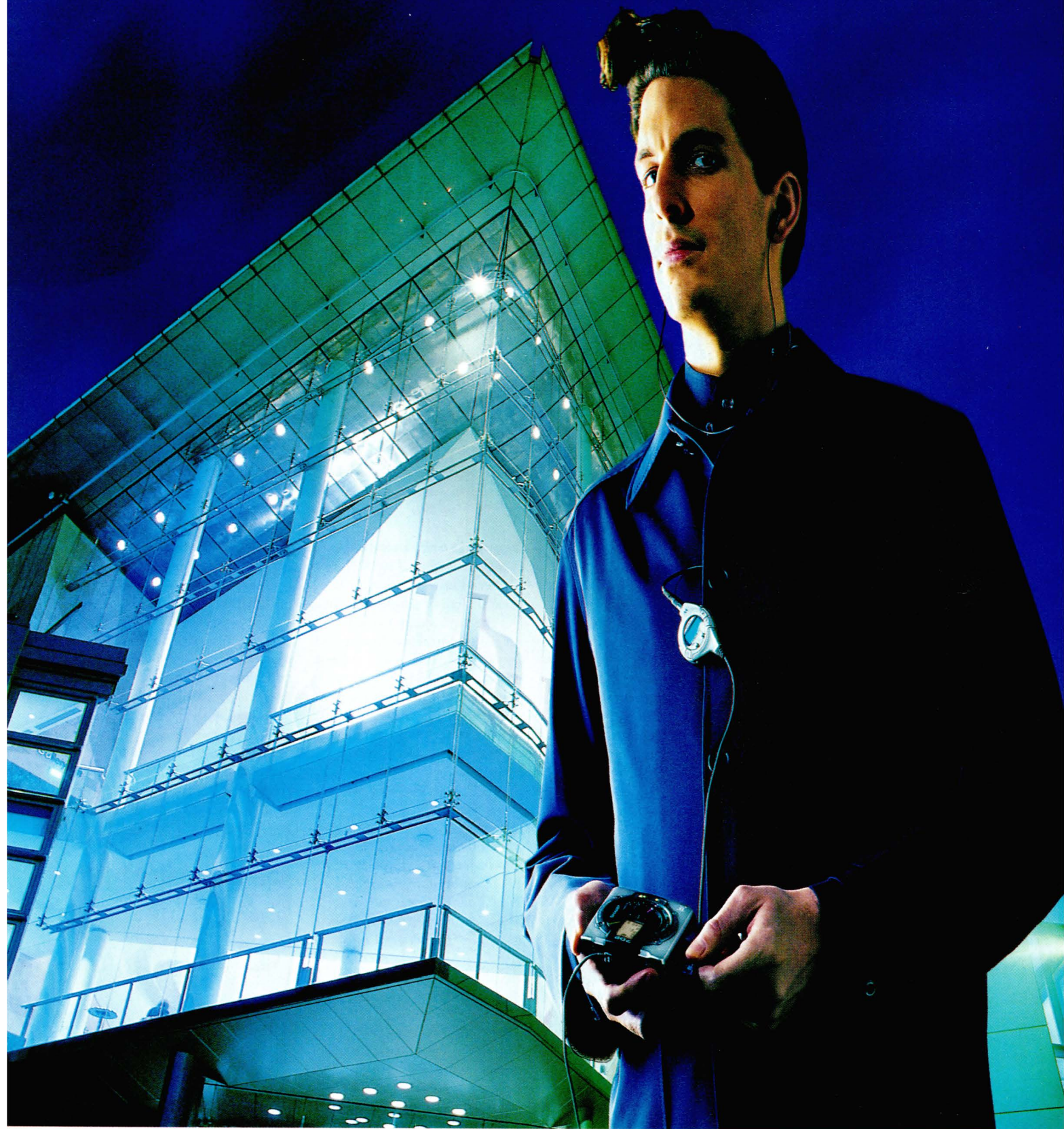
**Clean machine**  
 Thank you for your review of our Tower T/4 loudspeaker, from our Traditional Range (HFC 176). We have managed to trace the cause of the lumpy bass, and production models are now all being fitted with a new 'honeycomb' graded acoustic section filter, which cures this effect of the sealed enclosure.

Alan Sircom's assertion of curtailed high frequencies is simply not borne out by our measurements or the public's reaction to our demonstrations. My goal in developing this range of loudspeakers is, as you say in your review, transparency, speed of attack, tuneful, deep bass and smooth treble. Not aggressive sibilants as found in most of today's dome HF radiators, seemingly only concerned with power and not musicality.

The writer spent his youth working for one of our leading recording studios and well remembers the difference between live versus recorded music via 'coloured' speakers. It is our aim to continue to offer clean-sounding speakers as neutral as all the parameters allow us.  
*Alan James, Design Engineer, Titan Hi-Fi Loudspeakers, Hockley, Essex*



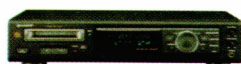
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# One Way Ticket

Stereo? Schmereo! Music writer **Phil Strongman** entreats audiophiles not to write off mono.

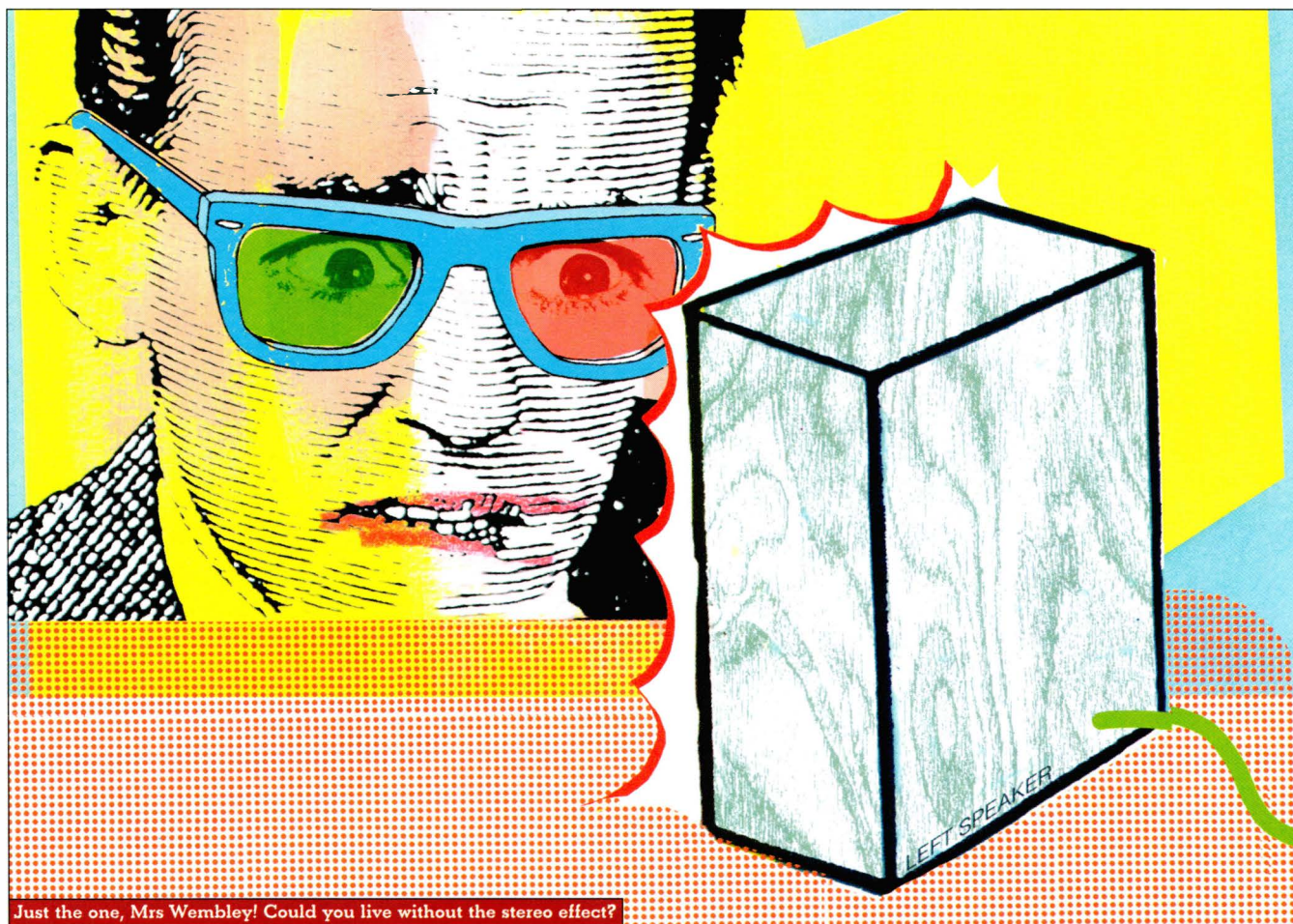


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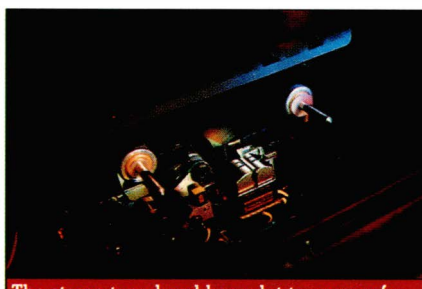
**B**y the late '60s, the majority of newly-released records were in stereo, and by the mid '70s, monophonic recordings were like black-and-white movies: a gimmick. There's been a natural assumption that all recorded music has been vastly improved by the advent of commercial stereo releases — but has it?

We have two ears, and logic would dictate we should listen to two loudspeakers as well. However, we also have two eyes, but no-one seriously advocates watching two screens simultaneously. The only time we see even two layers of vision is when watching one of those 'three-dimensional' films using red- and green-tinted glasses.

Perhaps there is a parallel between that visual illusion and the aural one that stereo claims to provide: depth. If you listen to a top-class hi-fi, and are sitting in the right place between the two speakers, you will begin to perceive that some instruments and voices are closer to you than others.

However, this really only applies to natural, acoustic instruments recorded in a real room using purist techniques. Most rock and pop recordings, on the other hand, are made in studios using electronic reverb devices, and their soundstages are synthesised using panoramic potentiometers (pan pots) on the mixing desk.

The biggest problem with recording this kind of music is the overlap between the frequencies of different instruments and



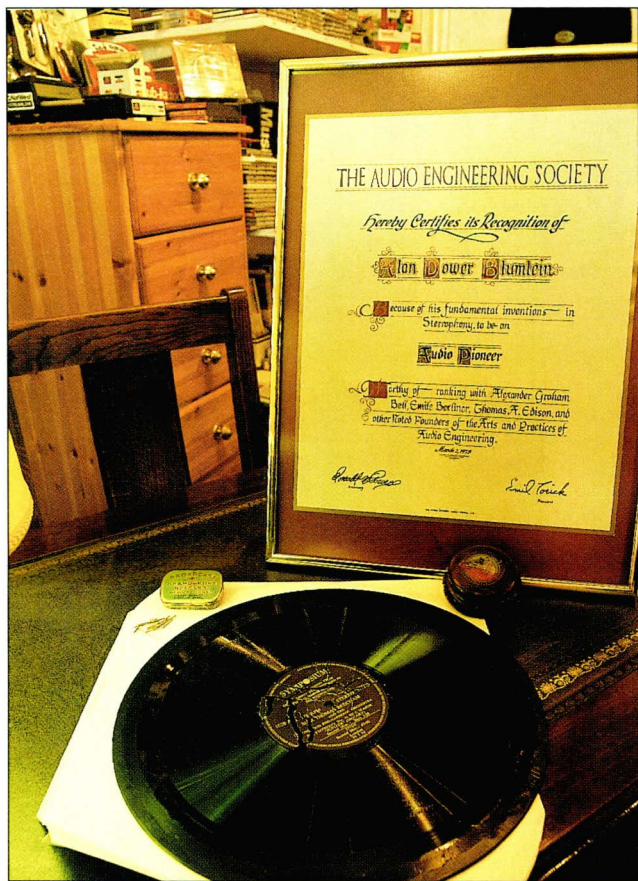
The stereo tape head has a lot to answer for

voices. Sound separation was — is — the key, and engineers of the distant past had to account for it using the vagaries of acoustics. They had to know, for example, the distance from the microphone a saxophonist should stand, and when he should lean in, quite literally, for his solo. Was this not a better way of achieving instrumental separation than just twiddling a knob on the mixing desk?

## Stereo in the studio

In any case, stereo was seen initially as just another mere studio aid. The recordings of Dion and the Belmonts are typical in this respect. When they were young and unknown native New Yorkers, their material was recorded cheaply onto one or two tracks, and issued in mono.

By 1959, when they'd clocked up a few million-sellers, they made music in four and eight-track studios, recording main vocals



Alan Blumlein invented stereo a long time before it became popular.

**Wall of mono**

US-based producer Phil Spector, who worked with the Beatles on *Let It Be*, also recorded The Ronettes, The Crystals, The Ramones, and Ike & Tina Turner. Spector always preferred monophonic recordings, even when production budgets would permit the use of stereo.

Spector stuck to mono like a leech, only giving ground when record labels actually demanded genuine two-channel masters. Such demands grew incessant during the '60s and early '70s, when stereo record-players, available for the first time in large numbers, began to sell in their millions.

The record labels had also discovered that although stereo recordings took a little while longer to set up, eventually they became a time-saver by virtue of stereo

panning on the mixing desk. This feature permitted engineers to put drums on the left, guitars on the right, and thus create instant separation between instruments purely by virtue of their left-to-right position.

In mono years, to achieve this degree of instrumental separation required the engineer to carefully adjust the tonal balance of instruments being recorded, to prevent too much overlap between them. This implied a much greater emphasis on getting the musical performance right first — primitive mixing decks and recording equipment left little scope to fix poorly-performed or badly recorded music 'in the mix'.

With modern mixing decks, however, engineers have so much control, almost any performance indiscretion can be amended after the fact. And, needless to say, just as once mono was the expected format of release, nowadays pan-potted stereo is all the rage.

**Back to the old school**

Despite the marketing-led onslaught of stereo, mono has refused to lie down and die. In 1975, pub-rockers Dr. Feelgood toured under a 'Back To Mono' banner, and even recorded their first couple of albums that way. However, it has taken the recent years' dance music to bring mono back into serious consideration by the cognoscenti.

This has been because dance music is not the kind of stuff to which you listen at home, on headphones, to get the perfect stereo separation. Rather, it is played in nightclubs and huge arenas, where the stereo image matters not a jot — but the tonal balance is every-

thing. Clubbers want to hear the full spectrum of sound from almost infrasonic bass to dog-whistle treble, through every speaker 'in the house'.

Mono certainly seems to have become the rage in the retro-music market. When a record company compiled a CD collection of rockin' doo-wop hits from The Olympics (*Doin' The Hully Gully*, Ace CDCHD 324, 1991), it couldn't find the mono master-tape of the last 10 tracks. The vaults contained only a stereo reverb master, so the compilation engineers dutifully distilled this into a single channel of sound.

This transformed the tracks into mono, of a sort, but also rendered them unlistenable. They sounded like they'd been recorded in a studio two blocks away, with vocals sung down the phone line!

Just as movie connoisseurs have fought to prevent the 'colourising' of classic black-and-white films, so music lovers should always insist on unadulterated mono versions of albums that were recorded first that way. It would be naïve to suggest we all throw away one of our stereo speakers, but by the same token, stereo imagery isn't everything. If it worked for the Beatles, maybe you should see what mono can do for you... ▲

**MONO AND STEREO — WHAT'S THE DIFFERENCE?**

Mono is short for monophonic. Quite literally, it means 'one sound.' The term 'stereo' is derived from a Greek word meaning 'solid'. It is not, as many people mistakenly believe, an indication of two channels in use. Stereo sound could be generated more convincingly by a music storage and reproduction system which uses in excess of two channels — hence Dolby Stereo, the system developed by noise-reduction pioneer Dolby Laboratories to create convincing soundscapes in the cinema. This uses phase cancellation and addition techniques to extract a four-channel signal from a two-channel soundtrack. And bold claims for 'three dimensional' stereo are being made by Dolby for its Dolby Digital system, which permits movie soundtrack makers — and music producers for that matter — to encode five entirely separate channels of information, plus a subwoofer 'effects' channel, within a linear soundtrack on the new Digital Versatile Disc, for example.



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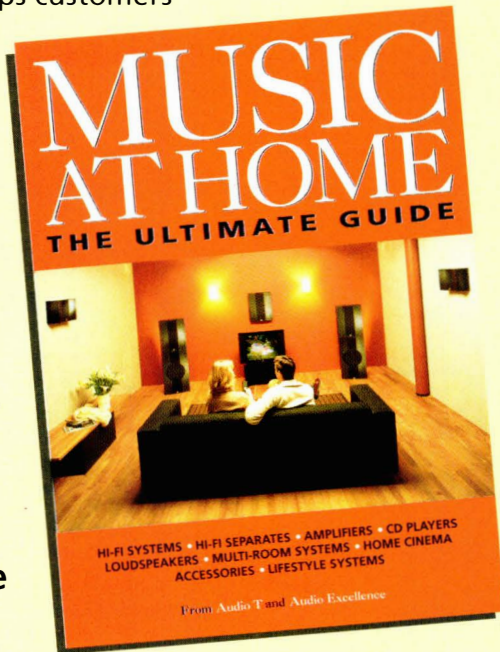


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# It's A Man's World

**I**f men can discover the joys of a wok, then why can't women discover the joys of hi-fi? Ever since time began, men have been associated with all things electronic, and women... well, they haven't. One look at the *Hi-Fi Choice* readership figures says it all — a mere two per cent are female. So why is it that men are so drawn to hi-fi and women so repelled? It's easy to put it down to the roaring testosterone that courses through the veins of our manly, rugged readers, giving them the uncontrollable urge to tamper with hi-fi — but are there other reasons?

Rowena Pratt, Product Manager at Gamepath, has her own theory: "Traditionally, hi-fi is a male toy. Women may be interested in the sound that is reproduced, but for us it's more an emotional thing, while with men I've found it's more technical."

For Rowena, her entry into hi-fi was purely circumstantial, though she did have a strong interest in music. Even after eight years in the industry, she does not consider herself an expert and has no inclination to become one. "I now know far more about what systems create what sound, and I enjoy the differences, but I don't want to know how or why," says Rowena.

Perhaps it simply comes down to a lack of 'train-spotting' tendencies in women: that insatiable appetite for facts and figures on one chosen topic. And whether it's trains or hi-fi that turn you on (figuratively speaking, of course), it is a very male facet. How many women can you think of with a thirst for such knowledge?

## A rare breed

This leads one inevitably to the great nature-versus-nurture debate. Is there some uncontrollable genetic imprint that defines the make-up of the not-so-fair sex? During the '40s, Austrian psychiatrist Dr Asperger wrote that such obsessive behaviour is more characteristic in boys, and can be a form of autism. Now known as Asperger's Syndrome, associated behaviour includes obsession with complex topics such as music, along with excellent rote memory and an intense interest in one subject, often to the exclusion of others. The watching of spinning objects for long periods of time has also been reported — so, if you find yourself absorbed by the motion of your vinyl...

For Rowena, it's cut and dried. "For the majority of women, it's the same as driving a car: we enjoy it, but don't want to be able to mend it. The whole object is to enjoy

Charlotte Ricca investigates why there is such a difference in hi-fi buying patterns between the sexes.



Bose's advert: would Marilyn have bought it?

music, which is what comes out at the end."

Not all women can be categorised, as Doreen Bance-Jordan of Bandor points out: "I've always been mechanically minded and enjoy working with my hands." It was this interest that led her to the hi-fi industry 36 years ago at Goodmans, where her role was to make the designers' concepts a reality. For her, hi-fi is all about a love of the intricate parts involved and the way they are pieced together to create a beautiful sound. In her words: "The sound should be effortless for the ear and it should reproduce accurately."

Doreen is indeed a very rare breed in the hi-fi world — a woman who makes her own speakers. However, she still recognises the importance of aesthetics in her system. "Women don't want monstrosities in their lounge; they want their hi-fi to be tucked away and pleasing to the eye. I predict that by the year 2000, hi-fi will all be in-wall."

## The power of advertising

So what exactly do women buy? For Doreen, who has a Mission CD player and a Cyrus 2 amp to go with — naturally — Bandor speakers, the amp is the potential weak link. "But as long as the speakers are of a high quality I don't worry too much about the other components," says Doreen.

According to Dave Ling, Sales Assistant at the London Bridge branch of Richer Sounds, the average female purchaser goes for something that is easy to use; most often multi-play CD players. "Women don't seem to want to be bothered with too much of the technical side. They also tend to go for small speakers; they don't want anything too big," explains Dave. When asked if women research their purchases, Dave replied: "They tend to have read the various hi-fi magazines and will have a list of what they're looking for." He also explained that many women who came into the shop had a degree of technophobia, and often bring in their husband or a male friend for advice and guidance. As a result, Richer Sounds has a policy of treating its female customers as equals to their male counterparts — but it appears Richer Sounds is in the minority.

Despite the fact that women are responsible for 45 per cent of CD purchases, the rest of the hi-fi industry continues to ignore this market. Male-dominated advertising, again, only serves to alienate women. A recent series of advertisements exemplifies an 'old-fashioned' attitude towards hi-fi marketing: a dodgy-looking peroxide 'bird' stares lustily out at you, in an equally dodgy basque (just the garb for cooking you up a lovely steak 'n' kidney pie), claiming it's "Me or the hi-fi". Not only is this an outrageously dated image, it also resembles something out of a '70s issue of *Penthouse*. Just what market exactly is this company trying to target?

Ultimately, it all boils down to money, and if men are the ones ploughing millions worth of dosh into hi-fi each year, then this is obviously the market that related magazines and advertisers will continue to sell to. Although there will always be exceptions to these rules created by science and society, which deem the world of technology to belong inherently to men, it seems that, for the time being at least, hi-fi is to remain somewhat of a mystery to the majority of women. As Rowena Pratt declares: "More often than not, men buy the hi-fi and women buy the Baby-Gros." It could be some time before it's possible to prove her wrong. ▲

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Coupar 01738 634809</p> <p><b>PETERBOROUGH</b> Audiovision 01733 352752</p> <p>Sevenoaks Hi-Fi 01733 897697</p> <p>The Hi-Fi Company 01733 341755</p> <p><b>PLYMOUTH</b> The Hi-Fi Attic 01752 669511</p> <p>Richer Sounds 01752 222256</p> <p><b>POOLE</b> Movement Audio 01202 730865</p> <p><b>PORTSMOUTH</b> Now That's Hi-Fi 01705 811618</p> <p>Now That's Hi-Fi 01705 811230</p> <p><b>PRESTON</b> Audio Excellence 01772 253057</p> <p>Practical Hi-Fi 01772 883958</p> <p>Sevenoaks Hi-Fi 01772 825777</p> <p><b>PRESTON</b> Richer Sounds 01671 773 0333</p> <p><b>READING</b> Audio T 0118 958 5463</p> <p>B&amp;B Hi-Fi 01734 583730</p> <p>Richer Sounds 01734 591111</p> <p>Sevenoaks Hi-Fi 0118 959768</p> <p>Sony Centre 0161 950 0350</p> <p><b>REDCAR</b> MSV 01842 494999</p> <p><b>RICHMOND</b> Riverside Hi-Fi 0181 892 7613</p> <p><b>ROMFORD</b> Richer Sounds 01708 747727</p> <p>Sevenoaks Hi-Fi 01603 767605</p> <p><b>ROTHAMPTON</b> Forum Hi-Fi 0115 962 2657</p> <p>John Kirk 0115 925 2986</p> <p>Richer Sounds 0115 924 1551</p> <p><b>SALISBURY</b> Salisbury Hi-Fi 01722 322119</p> <p><b>SCARBOROUGH</b> Audio One 01723 355654</p> <p><b>SEVENOAKS</b> Richer Sounds 01732 456573</p> <p>Sevenoaks Hi-Fi 01732 456555</p>	<p><b>SHEFFIELD</b> Audio Images 0114 273 7893</p> <p>Moorgate Acoustics 0114 275 6048</p> <p>Richer Sounds 0114 266 1616</p> <p>Sevenoaks Hi-Fi 0114 255 5861</p> <p>Superfi 0114 272 3768</p> <p><b>SHREWSBURY</b> Creative Audio 01743 241924</p> <p>Shropshire Hi-Fi 01743 232317</p> <p><b>SLOUGH</b> Fraser's Hi-Fi 01753 520244</p> <p><b>SOUTHAMPTON</b> Richer Sounds 01703 231311</p> <p>Sevenoaks Hi-Fi 01703 337770</p> <p>Southampton Hi-Fi 01703 228434</p> <p><b>ST. ALBANS</b> Radlett Audio 01727 855577</p> <p><b>ST. AUGUSTINE</b> E.T.S. 01726 75400</p> <p><b>ST. IVES (Camb.)</b> Intune 01480 465888</p> <p><b>ST. NEOTS</b> A N Audio 01480 472071</p> <p>Audiovision 01480 471202</p> <p><b>STEVENAGE</b> Audiovision 01438 355507</p> <p><b>STOCKPORT</b> Richer Sounds 0161 480 1700</p> <p>Superfi 0161 429 9080</p> <p><b>STOKE</b> Living Designs 01782 260047</p> <p>Superfi 01782 265010</p> <p><b>STOURBRIDGE</b> Music Matters 01384 444184</p> <p><b>STRATFORD</b> Stratford Hi-Fi 01789 414533</p> <p><b>SUTTON</b> COLDFIELD Music Matters 0121 354 2311</p> <p>Sound Academy 0121 321 2445</p> <p><b>SWANSEA</b> Audio Excellence 01792 474608</p> <p>Quinn's A.V. 01792 773644</p> <p><b>SWINDON</b> Audio T 01793 538222</p> <p>Sight &amp; Sound 01793 611253</p> <p><b>TAUNTON</b> Mike Manning Audio 01823 326668</p>	<p><b>TEWKESBURY</b> Sight &amp; Sound 01684 298109</p> <p><b>THAME</b> Thame Audio 01844 215431</p> <p><b>THORNTON HEATH</b> AWE 0181 653 3657</p> <p><b>TORQUAY</b> Upton Electronics 01803 551329</p> <p><b>TRURO</b> E.T.S. 01872 79809</p> <p><b>TUNBRIDGE WELLS</b> Sevenoaks Hi-Fi 01892 531543</p> <p>Sounds of Music 01892 547003</p> <p><b>TUXFORD</b> nr. Newark Chantry Audio 01777 870372</p> <p><b>UXBRIDGE</b> 01895 465444</p> <p><b>WALLINGFORD</b> Astley Audio 01491 839305</p> <p><b>WARRINGTON</b> Doug Brady Hi-Fi 01925 828009</p> <p>Practical Hi-Fi 01925 632179</p> <p><b>WATFORD</b> Hi-Fi City 01892 262169</p> <p>Richer Sounds 01923 218888</p> <p>Sevenoaks Hi-Fi 01923 215353</p> <p><b>WEYBRIDGE</b> Cosmic 01932 854522</p> <p><b>WILMSLOW</b> Swift Hi-Fi 01625 526213</p> <p><b>WITHAM</b> Sevenoaks Hi-Fi 01376 501733</p> <p><b>WOKING</b> Bartlett's Hi-Fi 01483 771175</p> <p><b>WOLVERHAMPTON</b> Superfi 01902 772801</p> <p><b>WORCESTER</b> Sight &amp; Sound 01905 22335</p> <p>Sevenoaks Hi-Fi 01905 619069</p> <p><b>WORTHING</b> Bowers &amp; Wilkins 01903 264141</p> <p>Phase 3 Hi-Fi 01903 245577</p> <p>Sound &amp; Vision 01905 619069</p> <p><b>WREXHAM</b> Acton Gate Audio 01978 364500</p> <p><b>YEovil</b> Mike Manning Audio 01835 79361</p>
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# Let's Record Things Better!

**H**umans have always been hungry to record their own works and deeds, from the earliest cave paintings to the most modern works of multimedia. The point is to share recordings with friends or colleagues, but to do this effectively calls for widely adopted standards. For many

**The CDR880 CD recorder is Philips' latest technological marvel. But why is it poised for great success? The answer is quite simple...**



years, hi-fi and music enthusiasts have dreamed of a simple standard system for home recording that combines excellent sound with durability.

Cassette tape has fulfilled this role for years, becoming very refined in the process. But nowadays it is often too slow and lacking in features for a world accustomed to electronic convenience. The race has been on to introduce a digital home recording format that everyone can use.

Compact Disc emerged as the forerunner early in the game, because it



has evolved organically and has been adopted across the board. Philips and Sony introduced CD in 1982 but since then countless third-party manufacturers and record companies have used it – and made money. Such has been its success, there have been numerous offshoots of CD into areas far removed from hi-fi, such as storage of electronic images and computer data.

### How Philips has developed CD-R and CD-RW technology

As the number of applications for CD have increased, so have demands that there should be a recordable version. To record on a CD would require a laser, like the one which reads information from the disc. A new system had to be developed, since a prerecorded disc is stamped out and cannot be modified after manufacture. CD data is read by a laser comparing reflections from the metal surface with non-reflections from tiny holes stamped in the disc.

For Compact Disc Recordable (CD-R), introduced in the early '90s, scientists developed special dyes – photosensitive organic dyes, to be precise – into which it

was possible to burn holes which could be read by an ordinary CD's laser. It worked, but it was a one-way process. Once 'burned', a CD-R cannot be erased.

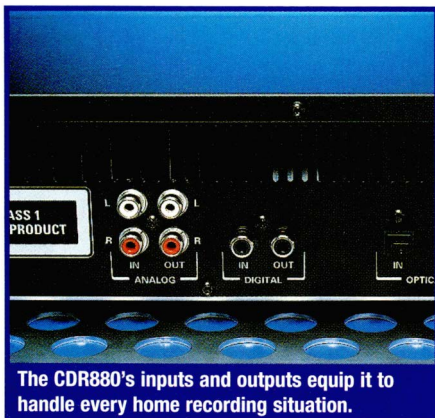
The next challenge was to take this concept further and create a disc which could be burned and erased many times over: one that would combine the rerecordability of cassette tape with the digital convenience of CD. The solution came from research into a field known as phase-change technology, in which special chemical compounds change their physical structure and maintain it, if heated and cooled down in a certain way. After many late nights for Philips engineers, finally they implemented the CD-RW facility which is at the heart of the new Philips CDR880, and which promises repeated recording and rerecording.

The CD-RW deck fires pulses of laser light at the CD-RW disc and ingrains the patterns of pits and raised areas that represent CD's digital code. When the time comes to rerecord, the laser just retraces its steps and lays down a whole new digital pattern.

### The unique benefits of Philips CD-R/CD-RW for home recordists

Other than their pristine digital quality, the key feature of CD-R and CD-RW recordings is interchangeability with ordinary CD players. That applies to home

**“Philips audio products will benefit directly from the company's prowess in data storage.”**



The CDR880's inputs and outputs equip it to handle every home recording situation.

decks, portables and in-car units alike.

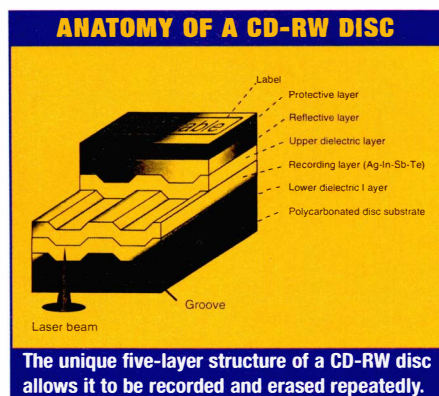
CD-Rs, when 'finalised', will play in any normal CD player. CD-RWs, however, don't reflect the player's laser to the same degree. This means that, at present, they will play on a growing number of standard CD players. Philips reports that new CD mechanisms — as used in the Philips CD723 due for launch in May — will be compatible with CD-RW discs. So the situation is good, and improving.

**How Philips CD-R/CD-RW makes home-recording easy**

Even though very complex technologies have been used to create the discs, and to manage them within the player, Philips has managed to conceal the proceedings behind a very user-friendly face.

This is due largely to Philips' unique, company-wide commitment to design and ergonomics in all of its products, across the board from hi-fi to domestic appliances. Many of these items traditionally had no user interface as such; the challenge has been to make their high-tech features available and controllable by every user.

But just how simple is it to operate the CDR880? Well, here's what you do. First, find a CD player with a digital output — either optical or electrical, since the '880 has inputs for both. Second, connect the digital output to the appropriate digital input on the CDR880. Next, insert a CD-R disc, if making a permanent copy, or a CD-RW for a temporary dub. Then it's just a



The unique five-layer structure of a CD-RW disc allows it to be recorded and erased repeatedly.

**THE PHILIPS CD RECORDER RANGE FOR 1998**

**R**ecordable CD from Philips is set to be the 'killer application' for record collectors and music fans during 1998. The possibility of creating home-made CDs that sound every bit as good as prerecorded CDs — well, that's what we've all been waiting for.

Elsewhere in this feature you can read all about the Philips technology behind CD-Recordable, and the exciting opportunities it opens up for allowing home computer interaction with your hi-fi.

First of all, though, let's take a look at the range of Philips CD recorders that you'll be able to buy this year. Remember, all of them will record on both the single-use CD-R discs and the new, reusable CD-RW discs.

First out of the starting gates is the top-spec flagship model, the **CDR880**. Priced at £499.99, this fully-remote-controllable deck includes every feature a home recordist could want. (See review on p.10 of this issue.) Naturally, it will operate seamlessly with any CD player totting a digital output. A Synchro Start feature means the recording starts when the original disc begins to play. Better still, all track numbers are transferred automatically from source to recording.

However, the CDR880 is just as useful for everyone with a precious music collection on vinyl. Because LPs are so fragile, collectors are often wary of playing them too often, lest their precious grooves become damaged. But thanks to the CDR880's built-in analogue-to-digital converter, cherished albums can be transferred easily onto robust CD-Rs or CD-RWs for everyday use. If required, the deck will even put on track numbers automatically, every time it hears a 'space' of three seconds or more.

For even greater versatility the CDR880 has a sample rate converter. Quite simply, this permits it to record digitally not only from CD at 44.1kHz sampling, but also from Digital Audio Tape, DAT (48kHz) and digital radio broadcasts (32kHz).

It has two pairs of digital inputs and outputs — both optical and electrical — and of all CD recorders on the market, *Hi-Fi Choice's* experts have deemed it the simplest to use.



Philips CDR760: CD-RW for just £399.99.

Although Philips' CDR880 has set a new low price-point for CD recordable technology, there's an even keener-priced model due from Philips in August. Named the **CDR760**, it still offers the most useful features of its more expensive big brother — but quite amazingly, costs only £399.99. It has the same automatic track numbering facility and auto-start function; all that's missing is the sample-rate converter.

Now here's another world-first for Philips: a remote-controlled CD recorder for mini systems! The **CDR560** is mini-priced, too, at just £349.99, and it offers all the facilities of the CDR760 in a diminutive, silver-finished case. Due out in August, it even has dimples on the top panel to make a perfect fit with your existing system.

But if you're buying a system from scratch, why not go straight into the big league? Philips is offering a special version of the CDR560, designated the **CDR538**. This mini-sized recorder will be bundled together with the Philips **FW-530C** mini system, becoming known as the **FW-538R** in the process.

But don't worry about those numbers — all you need to know is that the whole caboodle will be operated by a single remote control, and its price will be no higher than £550.

Combined, the CD recorder and system blend Philips' latest CD-Recordable technology with a 100 Watts RMS amp, three-CD changer, FM/AM RDS tuner, twin, full-logic tape decks and Incredible Surround — Philips' high-tech way of generating an all-around sound effect from just two speakers. Whatever next?



CDR560: mini-sized CD-RW at £349.99.



Philips FW-530C mini system is known as FW-538R when packaged with a special version of the CDR560.



### One day, all CD players will be made this way!

Although they have just arrived in the audio world, CD-R and CD-RW are already a big hit with computer users. In 1997, some three million CD-R and CD-RW drives were sold, up from one million drives in 1996. Projections suggest seven million drives will be sold in 1998, 15 million in 1999 and 24 million in 2000.

In time, the audio application of CD-RW will start to sell in these quantities too. Philips spokesman Chris van der Veen expects Europe, USA, Asia Pacific and South American regions to show the strongest interest in CD-R/CD-RW.

Already, companies other than Philips are rushing to manufacture their own CD-RW drives under licence. And in the computer market, pundits are even now suggesting that CD-RW will be compatible with DVD-ROM discs. The one certainty is that users of Philips audio products will benefit directly from the company's prowess in computer data storage.

CD is everywhere. In the home, in the car, in the portable stereo, in the computer. It is a proven format, whose remit extends from the very first CDs produced in the early '80s, through to next-generation applications that we can't even imagine now. But one thing's for sure. The future is disc-shaped, shiny — and for music lovers, very bright indeed.

matter of pressing the synchro start button on the recorder, followed by the play button on the CD. The CD is copied, bit by bit, track by track.

Once recording is complete, you'll find that, to all intents and purposes, the recorded CD copy is identical to the original. On a digital dub such as this, track numbers are copied across automatically. Just one task remains before you can play the CD in another machine, and this step is called finalisation. This takes a couple of minutes, and the copy process is complete.

Because the dye layers are easily damaged, you must write only on the label side in felt-tip pen. But Avery LabelMaker software and suitable round labels are available to smarten up your copy disk.

### Why Philips CD-R/CD-RW is a winning format

When it comes to choosing a digital home recording format, no-one likes to back a loser. Many high-tech hardware systems have been launched with a massive fanfare, but consumers won't warm to them unless there appears to be strong support from software manufacturers.

And here the figures explain why CD recordable is going to be a winner: according to Philips, the average consumer

already owns a CD library worth almost £2,000. And at current estimates there are 500 million CD players in use around the world, as well as 200 million CD-ROM drives in PCs.

Furthermore, while record companies have traditionally taken a dim view of home recording, and have used this as an excuse to hold back on software support, this just isn't an issue with CD-R and CD-RW. Every blank audio disc is protected by Serial Copy Management System, which prevents a digital CD dub being cloned again and again.

Indeed, after a top-level meeting held in Athens at the end of the 1980s, music manufacturers agreed not to attack new digital recording systems provided they included the SCMS system.

Intriguingly, recent statistics indicate that, if anything, home recording actually pushes up the sales of original albums. CD-R/CD-RW is so easy to operate, users are copying much more music from friends and colleagues, and discovering new favourite albums. In the fullness of time these are purchased for their collectability and the benefit of their full sleeve notes.

The simple fact is that Philips CD-R/CD-RW opens up access to music. Mark Chatterton, Audio Marketing Manager for Philips, reports that on average, customers buying a machine like the CDR880 purchase at the same time an average of 40 blank CD-R discs.

## GET MORE INFO

The Philips CDR880 is reviewed in this issue of *Hi-Fi Choice*, on page 10. For further information, call Philips ☎ (0181) 665 6350, or visit the company website at [www.philips.com](http://www.philips.com)

## HOW TO BUY BLANK CD-R AND CD-RW DISCS

**S**o you've got your Philips CDR880, and now you just can't stop making copies of treasured albums and LPs — working copies that you can play in the car without worrying about damage or theft. You received four CD-R discs with the machine, but they were soon used up. Will it be difficult to buy any more?

The answer is a resounding "no". As the table below-right shows, at least six brands are producing blank CD-R and CD-RW software.

Manufacturers will be able to give stockist information, but you should be able to buy blank discs in all shops selling the CDR880, from blank media specialists and in larger record stores.

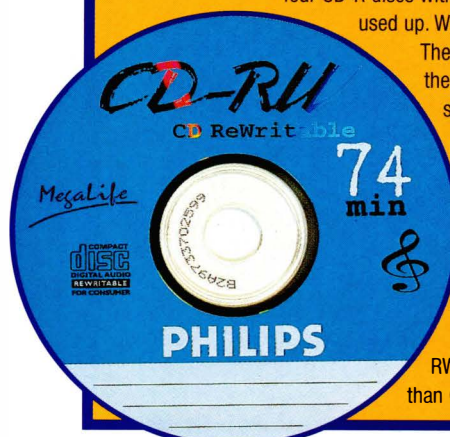
You'll note that at present, CD-RW discs are much more expensive than CD-R. This is because the cost of

audio CD-RWs is linked to the price of those sold to PC users, in what is a lucrative market right now. However, Philips insiders reckon that there will soon be such a large installed base of CD-RW drives, prices will have to fall. Expect CD-R price levels by the end of 1999, they say!

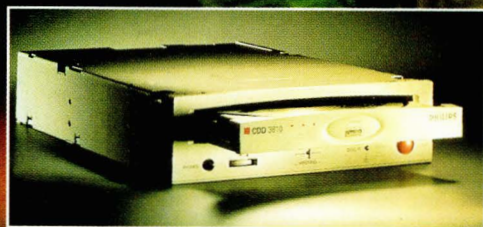
One point of caution: make sure to buy audio CD-Rs, not the cheaper data variety. Players like the CDR880 will only record onto the audio variety.

Brand of disc	CD-R	CD-RW	Contact ☎
Virgin			
EuroMagnetics*	£4	£18	(01293) 776252
Philips	£3.50	£18	(0181) 665 6350
Maxell	approx £5	to be launched in May	(01923) 777171
Verbatim	£11	n/a	(01784) 439781
Philex	£5.99	£19.99	(0181) 202 1717
TDK	£3.99	n/a	(01737) 773773

\* Special Offer pack of four CD-R/one CD-RW costs £29.99.



## CD-REWRITABLE: THE PC CONNECTION



Imagine if you could afford to restore old recordings to their initial glory, with all crackles and hisses stripped away. Philips makes it possible for less than £500!



The Philips CDD3610 PC drive turns your computer into a CD-R/CD-RW-equipped audio workstation!

**A**lthough CD is known best as a music format, in essence it is nothing but a digital data storage medium, as the massive success of CD-ROM has proved. According to Philips, there are currently 200 million CD-ROM drives installed all over the world.

And while audio users view CD-Recordable (CD-R) and CD-ReWritable (CD-RW) as next generation 'tape recorders', computer users regard these discs as the next generation of floppy disk.

But what possible use could a music enthusiast find for a computerised CD-recorder? Well, suppose you've got a favourite old tape or album that's been played one too many times and is now the worse for wear. It doesn't just look battered, it *sounds* battered. Can anything be done?

### The problem, the solution

If you were a real egg-head type, you could probably find a way of hooking up a CD or tape player to a PC sound card, squirting in the signal and then using software to do the clean-up. But there are two major problems with this approach. The first is that most PC sound cards have all the analogue fidelity of a £50 personal stereo. The second is that, having bulled up your recording, you can only listen to it through the PC's grotty multimedia speakers.

Philips' CD-RW technology sidesteps both of these problems by allowing you to combine the power of your hi-fi and PC equipment. Philips has a secret weapon: the **CDD3610**.

### Four steps to heaven

The CDD3610 is a CD-ROM reader/writer which is 100 per cent compatible with audio CD-RWs made, say on the CDR880 home deck. When teamed up with appropriate software, it can take music recordings and manipulate them digitally to remove as much unwanted noise and distortion as possible.

So in order to rejuvenate that tired old recording, first you would record it onto CD-RW using, say, the Philips CDR880. Using the '880's high-quality analogue inputs, the damaged recording would be digitised with no fear of corruption in the music-unfriendly innards of the average PC.

Next, you'd take that CD-RW, and slot it into a Philips CDD3610 drive in your PC. Third, you'd use the 'Spin Doctor' function of Adaptec Easy CD-Pro software (supplied with the '3610) to spruce up the signal 'in software'.

Fourth, you'd put the spring-cleaned music back on CD-RW or CD-R, and

enjoy via your hi-fi at leisure. If saved onto CD-R your treasured recording will now be playable on any of the 600 million CD players anywhere in the world.

But hang on a minute — don't you need a lab full of serious boffins to do this kind of work? Actually, no. The Spin Doctor software includes a de-clicking/de-hissing tool, which analyses recorded waveforms to locate portions that fit the profile of a click (high rise time, high level, short duration). The software replaces it with a sound that matches what came immediately before and after the click.

### Storage under your control

A major benefit of the CD-RW capability is the way it allows users to deal with each track separately. Once you've processed each one to perfection, you can store them on CD-RW temporarily before 'mastering' the whole lot onto CD-R for everyday use. At the end you can just 'wipe' the CD-RW ready for the next session.

Although it's a little more tricky to install a PC drive than it is to set up a hi-fi system, the Philips CDD3610 is sold in a handy package, which your computer dealer will know as the PCA-362RW. This costs £329, and includes the '3610 drive, four screws and one blank CD-RW disc.

Bundled with the drive is the software you need to perform the audio restoration routine described above, Adaptec Easy CD-Pro, plus Adaptec's DirectCD, which enables the '3610 to behave like a computer hard disk. Since the '3610 is designed for use with an IBM compatible PC, all software runs under Windows 95 or Windows NT 4.0. However, Apple-Macintosh-compatible hardware and software is due for launch before the Summer.

Philips intelligence suggests that up to 210 million CD-R discs were sold by the beginning of 1998, and forecasts that six million CD-R and CD-RW drives will have been sold by the end of this year.

Perhaps in years to come it may not be outrageous to incorporate an input marked 'PC' on all hi-fi amplifiers...

# Help!

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LONDON W1P 7HJ • fax: 0171-917 5512  
e-mail: editorial.hifichoice@dennis.co.uk  
(Don't forget your postal address!)

**Jason Kennedy is here to answer your hi-fi queries!**

## Query of the month

### Transport? Schmansport! I'll use my PC...

A question concerning CD transports, which, if I understand correctly, perform a fairly prosaic task in a two-box CD system. The transport spins the CD, reads the bits and does the appropriate error-checking, then outputs a stream of data to the DAC, which then converts the coded sequence of bits into the line-level analogue audio signal which is sent to the amplifier.

Now, surely a CD-ROM drive in a PC is capable of reading a CD with 100 per cent accuracy after error checking, otherwise the PC would complain about corrupt data. So how can a CD transport claim to improve sound quality? If a £25 CD-ROM drive can produce an accurate sequence of bits, then what point is there in spending £500 on a CD transport other than obtaining a fancy user interface?

Richard Murray via e-mail

*For true hi-fi CD replay, it's not sufficient merely to present all the data in the correct sequence. It is also vital to preserve, as far as possible, the timing information of the digital waveform (ie, the edges of the CD data's one/zero square waves). See features in HFCs 147 and 165 for further info.*

*In a computer it matters only that all the data arrives intact. Microprocessors have plenty of time to sort out any temporal anomalies such as jitter. So PCs can use basic, cheap CD mechanisms, which generate all sorts of artefacts and errors that are immaterial to a computer but of serious trouble to the human ear. Thus, PC CD-ROM drives are invalid for use in all but the crudest audio systems.*

*Furthermore, although physically separate CD transports and DACs have long been considered the ultimate digital source for hi-fi, they can all too easily introduce additional jitter if the digital interface between them is not properly implemented. Yet another example of hi-fi not being quite as straightforward as it seems!*

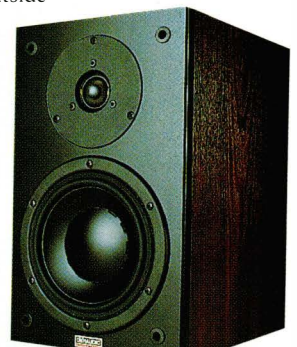


Ultimate computing power, but how about its music replay?

### Hard to handle

My system comprises Musical Fidelity A220 amp and Kenwood DP-7090 CD player. I found the amp sounded gorgeous with the Meridian 506 CD, but the latter is way outside my price range. Now I want to replace my home-built speakers. I have Cable Talk Professional 2 interconnects and 3.1 speaker cable. I listen to all kinds of music: classical, jazz and pop. My sitting room is 5.2m square, and imparts a 'hard' character to the sound.

Making a short-list of trial speakers has been difficult as all three dealers in Rotterdam made different suggestions. Could you suggest three to try?  
Mark van de Pas, Rotterdam, The Netherlands,



Dyaudio Audience 50

*We'll presume your speaker budget is in the region of £300 to £500, which should secure enclosures good enough to warrant an upgraded source later. You don't mention which speakers were fronting the MF/Meridian combo, but there are a lot of good options. At the affordable end of the spectrum there's the Heybrook Heylios or NHT Superone, while for a few guilder more there are some class acts including the B&W DM603, Mission 752 Freedom or Dyaudio Audience 50. Audition and enjoy!*

### One good turn deserves another

I have an Electrocompaniet EC-2/65 Signature pre/power amp, Technics SL-PS840 CD player and Quad ESL-63 speakers. Cabling is Wireworld Equinox, Audioquest Ruby and Audioquest Indigo 2 interconnects. My room is 5x3.5m.

I want to upgrade my CD player to a Theta Miles, and buy a turntable; either Pink Triangle Tarantella/Rega RB300, Roksan Radius 3/Tabriz, or Notts Analogue Spacedeck/Space tonearm. Would a Koetsu Black Gold Line work?

Viorel Popescu, Bucarest, Romania

*You have the makings of a nice system — is it possible for you to spend more on the turntable? If not, our advice will come down to taste. All three turntables are decent designs; however, we've only had brief experience of the Tarantella. That caveat aside, expect the Pink Triangle to sound neutral and clean; the Roksan will get your foot tapping; while the Spacedeck revels in dynamics and bass weight. Our preference would be the heaviest model (Spacedeck). We haven't tried the Koetsu Black Gold Line cartridge, but it sounds a rather exotic cartridge for the mid-market decks you list. You'd be better off spending more on the turntable and arm, and settling for a more modest needle like a Grado Prestige Gold.*



Nottingham Analogue Spacedeck.



### The moon on a stick

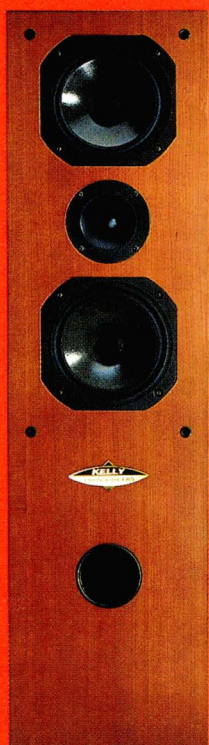
I have an Audiolab 8000A amplifier, Arcam Alpha 7 CD player, NAD 414 RDS tuner, Tannoy 605mkII speakers with matching stands, Wireworld Oasis III and Solstice II interconnects, and Cable Talk III bi-wire speaker cable.

Though I acquired the electronics a year ago, the Tannoys have been with me for over four years. All of the equipment is situated in my lightly-furnished, 17ft x 22ft living room. I enjoy all kinds of music, but classical is my preferred style for more serious listening.

My problem is that the sound is rather flat, lacks detail and becomes harsh when played loud. I believe that changing the speakers will give me the sound I seek. I'd prefer floorstanders and something that will give more detail and clarity: a big, weighty sound that's effective at low volume and not harsh at high volume levels. I am not restricted to a set budget so long as the chosen speakers don't outclass the rest of my set-up, which I hope to keep for quite a while.

Shaiful Azmi, Malaysia

*It may be an impossible task to find a loudspeaker that fulfils all of your criteria, given the composition of your system. However, you should start by recognising that you'll need a reasonably large enclosure to give good sound at both high and low volume levels. We recommend that you attempt to audition some or all of the following: Audio Note AN-J/B, Castle Howard, JBL 4312mkII, Kelly KT3 and Rogers Studio 7. If these are too dear at or around the £1,000 mark, you might get away with the Dali 606 or B&W DM603.*



Kelly Transducers KT3



Yamaha AX-492

### Housing crisis

I am looking for an amplifier for my first hi-fi system, to be installed in a quite large room, so it needs to be rated at about 50 to 100 Watts per channel and should have a remote control. It should also be quite a well-known brand as I live in Malta. Also, I need a pair of speakers which will suit this amp and, preferably, could be hung on the wall. My budget is around £600.

In the meantime, is it a good idea to use a portable CD player instead of buying a full-size domestic unit? If I saved money by doing this, should I try to buy a cheap tuner instead? I listen mostly to dance and house music.

Aldwyn Zammit, Malta

*To all intents and purposes, you are putting together a complete system. By far the simplest way of doing this is to visit local dealers, tell them how much you have to spend, and find out which equipment they would recommend. However, we suggest that you try the Kenwood KA-3020SE, Denon PMA-350SE or Yamaha AX-492, though only the latter offers remote control, and with its high power output, it's probably your ideal choice.*

*Make sure you choose efficient speakers (ie those with a sensitivity rating of at least 86dB/Wm). Specialised wall-mounting designs may be beyond your budget, but try and hear some of the following: Dali 104B, Mordaunt-Short MS30i, Tangent Monitor 9 and Wharfedale Valdsu 500.*

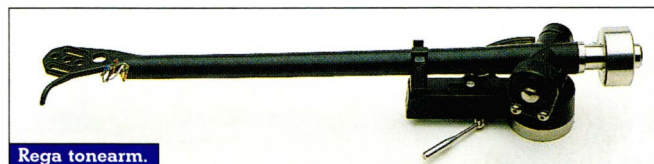
*As for personal CD players, just say no. They don't compete with the domestic variety. Select a full-size CD player from the following models: Denon DCD-635, Kenwood DP-3080 and TEAC CDP-3450SE, and start saving again for a tuner!*

### Weigh to go

I'm the happy owner of a Rega Planar 2 turntable. The only problem is that its tonearm has no adjustment numbers on the balance weight, which makes it very difficult to set the tracking force to account for the needs of different phono pickup cartridges. Where would I find a precision-calibrated suspension balance to eliminate guesswork?

Marios Stavropoulos Grigoriou, Pylea, Greece

*Before CD took hold as the music carrier of choice, stylus pressure gauges used to be a ten-a-penny. Now they're an all-but extinct breed, although any hi-fi dealer who sells turntables ought to have a few under the counter. In Update HFC 174 we reported the launch of an electronic version from Moth Group (☎ 01234 741152), though this costs a cool £185. Alternatively, there's a rule of thumb with the Rega arm, in which one half-turn of the counterweight represents a gram's worth of tracking force. To set the stylus pressure, adjust the counterweight until the arm (with cartridge) is level. Then turn the counterweight clockwise by the requisite number of half turns and your stylus pressure will be roughly correct.*



Rega tonearm.

### The pre musketeers

My system includes a Marantz CD-63 KI Signature, Musical Fidelity X10-D CD enhancer, a pair of Musical Fidelity P140 power amps, a QED SDR preamp, Mission 733i speakers, Cable Talk Monitor 2 interconnects and 3.1 bi-wire cable.

The weak links are the preamp and speakers. I am looking for good soundstaging and timing. I need my system to operate well at relatively low volume. My room measures 15ft by 11ft, with the speakers firing across the narrower dimension. I have a budget of £500 and could buy second-hand. My musical tastes are baroque classical, pop and guitar-based jazz.

Richard Hall, Norwich

*We'd agree with your analysis of the system's bottlenecks, but it may be difficult to replace both preamp and speakers to good effect within the budget at your disposal.*

*We'd suggest you try a Musical Fidelity X-PRE or a second-hand Audio Innovations L2 to replace the QED, and then save up a little more money for a distinctly better speaker such as a B&W DM603, Royd Doublet or Dali 104B.*



Musical Fidelity X-PRE.

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# Experience the Excellence of Naim Audio

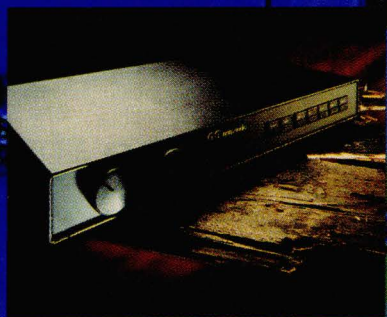


The CD3.5 Integrated CD Player has been developed to offer complete musical satisfaction rivalling that of the finest analogue turntables. It is designed to be the best in its class, incorporating genuine technological advances to provide a thoroughly enjoyable musical experience.

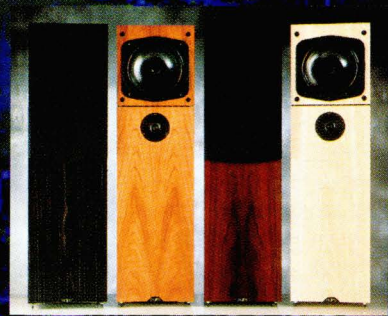
The NAT 03 Tuner is based on the famous NAT 01 and NAT 02. The NAT 03 is unmatched for sound quality at its price. It is clear and articulate when correctly installed with a suitable aerial and makes music like only a Naim tuner can. The NAT 03 is fully compatible with all Naim Audio Systems.



The NAIT 3 Integrated Amplifier has been designed with significant improvements over its illustrious predecessors. It now boasts more power and can drive an even wider range of loudspeakers. Isolating the pre-amplifier section and adding a separate Power Amplifier enhances versatility even further.



The Intro Loudspeakers feature Naim's unique separate box technology with bass/mid driver and tweeter mounted in their own separate cabinets. The Intro is designed to partner all of Naim's amplifiers, like NAIT 3. Intro is easy to drive and will continue to offer improved sound quality as the system is upgraded.



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**Naimed — and shamed?**

I've got a Rega Planet CD player (Chord Cobra interconnect), Nakamichi 582 tape deck, Naim Nait 3 amp, Aiwa FM 9700 FM tuner (Chord Chrysalis interconnect), Naim Intro speaker (NAC A5 speaker cable) and two Sound Organisation stands.

I am now bored with my system's forward, tiring sound. I listen to a lot of jazz, reggae, African music and R&B.

I want to get rid of the Nait 3 and get a NAP 140. I would love to partner the 140 with either the 32.5 preamp or the 62. I have heard the 62 (old style) with a Hi-Cap power supply and was impressed with its fast sound.

WM Chakawhata via e-mail

*It's not surprising that your system sounds forward. It's the audio equivalent of a Caterham sports car! Like the motor, this kind of rig is built for exhilaration, not comfort, in common with Naim's product philosophy. One way of adding bass power and extra rhythmic integrity would be to add Mana Acoustics supports under both electronic equipment and speakers.*

*There's no doubt that many audiophiles have reached nirvana by locking into the persuasive Naim philosophy and following it to the nth degree. However, from the drawback you claim to have identified in your current system, we would counsel caution before blindly travelling further Naimwards. Now is the time to work out whether the Naim family sound is really your hi-fi Holy Grail. If it is, you need the assistance of a committed Naim dealer to reach the top of the ladder at a pace you can afford. Don't be tempted just to buy secondhand Naim equipment willy-nilly: it might seem financially attractive but might well prove very confusing.*

*On the other hand, if your tastes have changed, you have an even greater need for expert advice. Your next stop should be your nearest hi-fi dealership!*

**Polker classes**

I own a Bang & Olufsen 5500 system, purchased 10 years ago for reasons of convenience rather than sound quality. I am now seeking to move into more specialised realms of hi-fi, and need to replace the whole outfit except for the speakers, a pair of Polk SDA, which I believe would work among separates components. I brought them into the country in 1987 when nobody had heard of the brand in the UK — are they still up to the mark?

I would like to upgrade in stages: first a new CD player (up to £1,000), then an amp when finance permits. Should I start from scratch or stay with my speakers? Can you tell me what will give the optimum result with these speakers?

Peter Davidson, Camberley, Surrey

*We are not familiar with the Polk design you own, so we can't make an unequivocal recommendation of CD player and amp. However, as you suggest, they're probably up to the job of partnering more serious separates components. The best way to find out is to locate a helpful local dealer (see our Dealer Guide and Dealer Directory on pages 94 and 132 respectively). Haul your Polks into the shop's demonstration room and ask to hear them on then on the end of some well-respected mainstream components. For example, the Arcam Alpha 8SE CD player with Alpha 9 amp. (If the Polks are bi-wirable, get the dealer to add an Alpha 9P power amp as well.) Alternatively try Pioneer's PD-S505 Precision CD player and A-300R Precision amplifier. For a more left-field (and more versatile source) try out the Pioneer DV-505 DVD-V player — you'll be amazed how well it plays regular audio CDs!*



Arcam Alpha 8SE

**A salutary lesson**

Like so many other readers, I want to upgrade my amplifier. At present I use a Moth Thirty Series (30 Watts) power amp. I have considered the DPA 200S power amp and Audio Analogue Puccini integrated amp as alternatives.

Sou J Vang, Sacramento, California

*This query is almost impossible to answer. In fact, it's been printed only to remind everyone that separates hi-fi components don't exist in a vacuum. They function only in conjunction with other hi-fi components, and serve as a permanent justification for the old aphorism, the whole is greater than the sum of the parts.*

*The fascinating part of hi-fi is finding out which components combine to greatest effect. But with which CD player and speakers does this reader intend to partner a new amplifier? These are facts we need before issuing any advice — others are musical tastes and constructional characteristics of a listening room, such as its dimensions and the type of floor it contains.*

*Another imponderable here is why the reader is considering the purchase of either a power amplifier or an integrated design. As you will read in The Directory (p114), we rate both proposed purchases highly. But that's all we can say in this instance!*



Audio Analogue Puccini.

**Set sail on the Caspian**

My system consists of Roksan Xerxes/RB300/ATOC5 record player with Michell Iso phono stage, Sony CDP-911E, Rotel RHC10 passive preamp, two RB960 power amps bridged, Denon DRM-800 cassette deck and Sony DTC-690 DAT player, feeding Tannoy 611 mkl speakers.

I intend to upgrade the Iso with a Hera power supply, and purchase a Sony CDP-X3000ES or Pioneer PD-S505 Precision. I don't know whether to get a Rotel RC995 preamp and keep the power amps; or should I substitute a Roksan Caspian integrated amp, worrying about the power amp at a later stage?

I hope to change my speakers to B&W DM603, which I have auditioned very satisfactorily with the Caspian; and when I change my cartridge, I will purchase a Denon DL-304.

D. Stevens, London



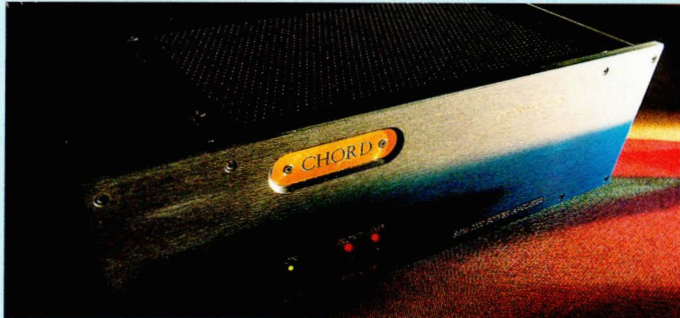
*We would suggest that you look at the Caspian integrated. Your speaker and cartridge choices also seem sensible, but have you tried other speakers? It might make more sense to be a little more ambitious in this department considering your plans for the amp. Have you heard the Acoustic Precision FR1? Or what about a pair of Roksan Ojan?*

*Our comments on CD players must be qualified by the emerging evidence that, in lower priced sectors at least, DVD video players are putting in a very convincing audio performance. For this reason, audition the players on your shortlist, but try to hear the Pioneer DV-505 DVD player as well.*

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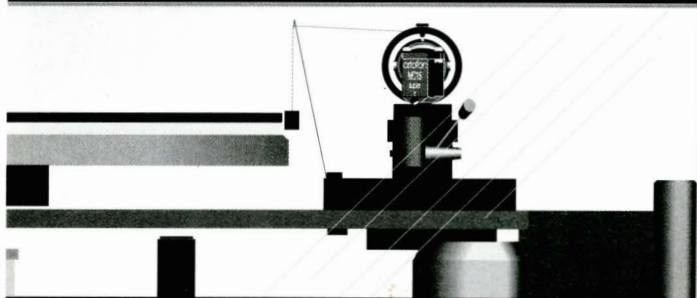
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**Up a gum tree**

My system includes Mission 753 speakers, a Pioneer PD-S904 CD player, bi-wired multi-strand cable, Newtech KHS124A OFC interconnects, and a Redgum amp. The latter is an Australian brand, with Mosfet output stage giving a rated output of 120 Watts per side.

I'm very happy with the sound of the system, but detect a lack of airiness and nuance, and would like a 'bigger' sound. I suspect the CD player is the problem. I auditioned the speakers and amp more carefully prior to purchase, and I know that the speakers give satisfactory sound. I play pop, jazz and orchestral music. *RS Newman, Australia*

*Redgum put in an appearance at last year's Hi-Fi Show in Heathrow's Ramada hotel, alongside a number of other Aussie brands, but we've yet to sample the pleasures of these red-wood-faced beauties. Perhaps we should!*

*Apart from your cabling, the PDS-904 is probably limiting 'air' and image scale. In hot-rodged form, this player forms the heart of Acoustic Precision's superb Eikos CD player, a £2k machine which has won over a number of HFC contributors with its stunning imaging skills. However, unless you're planning a visit to Blighty, it would be impractical to suggest that you should have your Pioneer 'Eikossed'!*

*CD players worth auditioning, that should be on sale in Australia, include the Meridian 506, Cyrus dAD3Q and Sony CDP-X3000ES. We are currently on the horns of a dilemma regarding CD playing sources, since at least two of the new DVD players in the UK — the Pioneer DV-505 and Panasonic DVD-A350 — seem to sound better than the majority of comparably-priced CD players. Next month's HFC will see a showdown between CD and DVD, but it would be worth your while not only to audition the CD players we recommended, but also to compare them alongside a DVD machine.*

**Living in a box**

I have a Sherwood 4030R CD player, Cambridge Pacific interconnect, Rotel AX930mk2 amp, Cable Talk 3.1 speaker cable and B&W DM301 speakers. I listen to classical (especially choral and church organ) music in a room 9 feet by 12 feet, and 10 feet high.

While the sound is by no means unpleasant, it lacks the detail, transparency, imaging and general 'oomph' I expected from a separates system. Are these symptoms of poor installation? Should I bother with speaker stands at this humble level, but if I do need them, which models should I choose?

*Jonathan Lilley, Leeds*

*Should you bother with speaker stands? Does Carmen Miranda wear fruit?! Having lashed out six hundred quid on a separates system, the least you can do is invest another £60 on speaker stands. These are essential to unlock the potential of small speakers like your B&Ws. The stands ensure that i) tweeters are at ear-height; ii) that only the speaker's drive-units move, not the cabinets as well (decouple the box on spikes for ultimate effect); and iii) that you can move the speakers to the ideal position in the room for stereo imagery and freedom from bass boom. do not move. It makes you wonder sometimes...*



*By the look of it, you bought your system from Richer Sounds, so why not pay them another visit and choose from the decent range of stands they stock. Atacama SE24 stands wear an HFC Best Buy flag, but there are numerous alternatives under the name of Gale and Target, for example. Speaker stands are not just accessories: they are an essential part of a system.*

*Having supported your speakers, don't neglect your electronic components: inexpensive equipment isolation comes in the shape of the Quadraspire Q4, Sound Organisation ZS560 or Target B5.*

*These actions should get your system firing on all four; next, start saving up for a new CD player. Affordable examples reviewed this month from page 80!*

**Epos speaks volumes**

My system comprises Micromega Logic CD player, Cyrus II amplifier, Epos ES11 speakers linked up with Cable Talk green speaker wire, and Reference interconnect between the electronics.

The speaker cables' aesthetics are less than perfect, and the amp's volume control is hard to set. I would like more bass and transparency.

Is it worth having a Clock 2 upgrade fitted to the CD player, or should it be replaced? How much would it cost to obtain a genuine sonic improvement? Any new amp needs to be as musical as the Cyrus but with a better-paced volume control. I've read that a good pre/power amp combo is required to get the best out of the ES11, but I would be happy to buy another integrated such as the Caspian, if this would provide accomplished performance. The speakers are last on the list for upgrading, but would they reproduce improved bass resulting from the enhancement of CD player, amp and



Dali 104B.

**speaker cables?**

My budget is around £1,500 and I listen to a wide range of music. *Neil Christie, Hounslow*

*We suspect your speakers are causing the problems with medium and low-level listening, and bass extension. The ES11 was neither a particularly sensitive design nor one that generated a lot of low-frequency grunt — its sibling, the ES14, covered that angle. Listen to some of the following alternative loudspeakers: B&W DM602 and Keswick Audio Aria II stand-mounts or Dali 104B and Royd Doublet floorstanders.*

*Clocking the Micromega would probably improve its sound to some degree, but it would probably be a better investment to trade it in for something contemporary from the Pioneer, Arcam or Marantz brands (plenty of examples in our Directory, p114). Choosing from this kind of marque leaves plenty of options open for the acquisition of a matching amp in due course.*

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◀ In a cable conundrum

My present amplifier is the Marantz PM-66 KI Signature, the speakers are some old Mission 760SE with QED Qudos bi-wire cabling, and I use an old Denon DCD-920 hooked up to a Cambridge Audio DACmagic2 mkII.

I have been planning a speaker upgrade for a while, but I've just read HFC 177's Oasis of Sanity article on the effect of speaker cables. Most of it went over my head, though, I'm afraid, and I'd like to know which cable would get the best from this Marantz/Dali combination.

David Cadogan, Herts

Technical Editor Paul Miller replies... The crux of my Oasis in Issue 177 was to demonstrate that the higher the resistance of the cable (ie the thinner the cable) and the higher its inductance (a function of geometry) then the greater will be the modification of

the amp/speaker frequency response. Therefore, a thick, low inductance cable will encourage the 'flattest' response from the Marantz which has a lowish 0.03ohm output impedance. Not that this, necessarily, will reward you with better sound quality. Try Kimber's 4TC or Ortofon SPK300 (if you can find it).



# HINTS AND TIPS

## IN THROUGH THE OUT DOOR

JIMMY HUGHES DARES HI-FI OWNERS TO USE OUTPUTS AS INPUTS — ALL IN THE NAME OF SUPER SOUND...

I've written before about the way to find the best-sounding input on an amplifier for your most important line-level music source. (Not to be confused with a phono input derived from a moving-magnet or moving-coil cartridge.)

Depending on the printed circuit-board layout of your amplifier or preamplifier, and the length of copper signal 'track' on the board, there can be audible differences between the various inputs, even though all of them are nominally identical.

Because compact disc is probably the main source for most serious listeners, it makes sense to give CD the best-sounding input. More often than not, this will be the input designated for CD, but it could just as easily be one of the other line inputs — aux, tuner or tape, for example. The only way to find the best-sounding one is to listen to each in turn.

With Musical Fidelity's X-PRE, for example, I find input three sounds slightly firmer and crisper than the others, although input four seems to have the shortest signal path. With the Michell Argo and Argo HR preamps, the best-sounding line input is Tape monitor, because this input bypasses the main input-selector switch and thereby offers the shortest, cleanest signal path.

However, for listeners who only have one line source, there's another option — the tape 'record' output. Read that last bit again: it's not a misprint, I do actually mean the output. This is

because most amplifiers and preamps are completely passive on their line input stages, so the tape output (sometimes marked Record Out) can be used as an input. As it bypasses the amplifier's input selector, it should be the cleanest, most direct signal path and, therefore, the best sounding. I tried using it with EAR's 859 integrated valve amplifier, and the improvement in detail and overall solidity was very noticeable.

Drawbacks? Well, aside from the fact that you're only able to use one source, perhaps the main thing to consider is the likelihood of reduced output volume, because the tape output is buffered. By buffered, I mean it is resistively attenuated so that the sound quality of the main amplifier would not be compromised if it was connected to a tape recorder with very low input impedance.

You can discern the presence of buffering by comparing signal levels, for a given setting of the volume control, between the regular inputs and the tape output used as an input. If the levels are noticeably lower through the output, the circuit is buffered.

Actually, even if the tape output is buffered, it shouldn't have too much adverse effect on sound quality. It would certainly be different, leading some loss of sparkle and immediacy, but at the same time there could be gains in bass/treble balance and integration. (See also my article in HFC 178 concerning Kimber Kable's attenuated interconnect). The music should sound smoother, more integrated, and slightly cleaner.

Believe me, this is a tweak worth trying. You might even get away with leaving the CD player connected to the tape output socket permanently, and still carry on using other line sources in the normal way. If your amp's tape output socket is buffered, there'll almost certainly be no problem with interference due to two pieces of equipment being connected in parallel. Even if the output is unbuffered, this configuration could still work, but you'd have to listen and compare very carefully to be sure that overall sound quality wasn't compromised in any way.

*Editor's Note:* if you are tempted to try this tweak, make sure that you can positively identify the tape output socket of your amplifier. Do not plug into any other kind of output, for example a preamp output. Any use of a product outside of its design parameters could cause damage that may not be covered by manufacturers' warranties.



# Wooden Tops

Paul Messenger gets to grips with Holfi, a Danish brand that's new to these shores. Wood you look at the quality!



Make your home a forest with the Holfi series from Denmark.

**H**olfi was a new name to me, as I trudged the corridors of The Hi-Fi Show at Heathrow's Ramada Hotel last autumn. I popped into the demroom and was duly impressed, not just by the unusual and refreshing aesthetics, but also by a sound that seemed to combine relaxing presentation with good pace and fine transparency. The people were relaxed, musically-oriented types, too, and the whole thing seemed substantially untainted by tiresome marketing hype. So I put my name on the list

as a potential reviewer.

A few months later, the Pre 8 pre-amplifier (£1,049.95) and Power 8 power amplifier (also £1,049.95) arrived, followed a couple of weeks later by the company's brand-new Xaurus CD player (£1,799).

Holfi is a small Danish company, seven people strong at the time of writing. In 10 years of trading, though, it has built up a good reputation through sales to Far Eastern markets. A leaflet from the Wisma Audio Centre (Penang and Kuala Lumpur) shows

an extensive range of models: three CD players, two integrated amps, three preamps, four power amps and three vinyl phono stages — plus three pairs of loudspeakers.

It's not clear which of these will be coming to the UK — or indeed whether some of several newer releases will have the honour. Still, there are plenty to choose from. The most striking feature of all products is the solid cherry-wood front panel, which looks considerably warmer and more friendly than most hi-fi products' acres of metalwork.





Despite appearances, not a 'grainy' sounding amp.

### Simple is beautiful

Wooden facias notwithstanding, the active components of these electronics are housed in the usual bent-steel casework. But even the components are anything but orthodox. In the majority of Holfi's range, the key technical feature is the use of battery-based power supplies. This is not unique; veteran readers may recall the Crimson tube-shaped preamp from the '80s worked this way too. More recently, we saw a similar kind of application in the Nagra PL-P preamp last month.

However, battery operation is the exception, not the rule, and on paper it makes sense for isolating the component effectively from mains-borne interference. These days 50Hz mains hum is less of a problem than spurious high frequency garbage generated by the ever-swelling ranks of microprocessors and digital communications systems.

Holfi's battery management system is certainly fuss-free. There's no need for users to switch between 'charge' and 'play' modes, either: the Holfi components behave exactly like any mains powered units. Turn off the mains and they go off, turn it on and they come on, taking up the necessary trickle charge to keep the battery topped up. Batteries are said to last at least five years.

Both the Pre 8 and the Xaurus have built-in battery supplies, and while the former comes with line-level inputs only, there's an optional plug-in phono stage board (m-m or m-c) for an extra £250. This, claims Holfi, works well with the battery supplies.

Both preamp and CD player are ultra-simple devices, which have been stripped bare not only of all inessentials, but one or two useful bits as well. The Pre 8 has just two (wooden) knobs; one to select the input, the other to set the volume. There is neither balance control nor tape-monitoring facility, so don't even ask about tone controls.

Still, the volume pot is a fine example of the breed, with excellent low-level channel tracking, and a drive-motor to permit

remote-controlled volume adjustment. Sadly, there's no means of remotely switching between inputs, but greater-than-average flexibility is found in the output stage, where four pairs of sockets cater for multi-amp or multi-room applications.

### A sight for Xaur ears

Like the preamp, the CD player's fascia is a model of minimalism, though the remote-control handset gives access to the usual convenience features. Another echo of the Pre 8 comes in the Xaurus's unorthodox electronic design, in which digital to analogue conversion is performed by a classic (some would say prehistoric) 16-bit, four-times-oversampling device, rather than the 'low-bit' techniques which are more prevalent today.

No digital output socket is provided, for fear of compromising the noise performance according to Holfi. You can specify one as a £50 option, but like audiophile record producer Gene Pope III (*HFC 169*), the manufacturer has a low opinion of the Sony/Philips Digital Interface Standard (S/PDIF), and no longer manufactures out-board DACs for that reason.

All the internal power supplies are implemented with passive regulation, to avoid the feedback Holfi says is inherent in normal voltage regulators. And one reason for the Xaurus's substantial weight is the quantity of bituminous mechanical damping material within the casework. Carbon foam is said to help soak up unwanted inbound radio-frequency interference (RFI).

All of this makes good sense in an £1,800 CD player. The idiosyncratic part is Holfi's adhesive-backed, CD-sized metal disc stabiliser, which they recommend you attach to a CD's label side prior to play-

back. I didn't mind the 'sticking-on' bit, it was the tedious prising off that dulled my interest — despite the sonic improvement it generated.

The Power 8 has even less features than the others. It's rated at a very healthy-sounding 100 Watts per channel into eight Ohms, or 170 Watts per channel into four Ohms. There are some useful WBT speaker-wire connectors on the back, and a species of mute switch on the front. Separate, high-rated supplies feed the input and power stages, and the circuitry is said to avoid any global feedback.

### Resistance is futile

Whatever its technical execution, this Holfi kit has an innate musicality that is difficult to resist. Foot-tapping tendencies sneak up on one's best attempts to appear calm and maintain *sang froid*. Writing this I'm even finding it hard to concentrate on the keys of my laptop, 'cos my attention keeps wandering back to Antonio Forcione's wonderful guitar playing (*Acoustic Mania's Talking Hands*, on Naim Records, NAIMcd020).

When connected with Nordost Solar Wind and Red Dawn cables, delicacy and transparency were the two adjectives at the top of the list. However, let's not forget the sweet, extended treble; the powerful, exceedingly deep bass; and the very low level of background noise. All deserve special mention. Tonality is essentially accurate and neutral, with a slight tendency towards brightness, perhaps. The whole experience manages to be thoroughly relaxing, yet also highly informative at the same time — a rare combination.

The Power 8 found itself connected to a number of different speakers, with Dynaudio's fine new Contour 3.0 proving a particularly fortuitous partnership. Combined, this pair of great Danes seemed extremely complementary, since in dynamics both err on the side of caution, while at the same time they offer great transparency and superb dynamic range. My regular Rehdeko 175 was a less successful partner, though it did permit me to appreciate the Holfis' low background noise.

Okay, so at times dynamic expression was a little less than vigorous, but in a positive light this only enhanced the politeness of some very well-mannered components. The lack of remote-switchable input selection would be the most obvious penalty clause, but this is a minor side-effect of otherwise well-executed simplicity.

I would say that the CD player has a slight edge over the amplification, but both product types are fine examples of their genre, and are priced really quite realistically for the standard of their finish and the quality they exude. ▲

Kiakaha UK Ltd ☎ (07050) 050911

# SOAPBOX SVENGALI

With a high-tech new cone, Wilson benesch's new Orator stands up and says what it thinks. **Jason Kennedy** is on this speakers' corner.

**T**echnology issues have always been intrinsically linked with hi-fi equipment. Until the advent of the home computer era, a CD player was probably the highest-tech gadget in most homes, and technological advances continue to fuel the pursuit of the absolute sound.

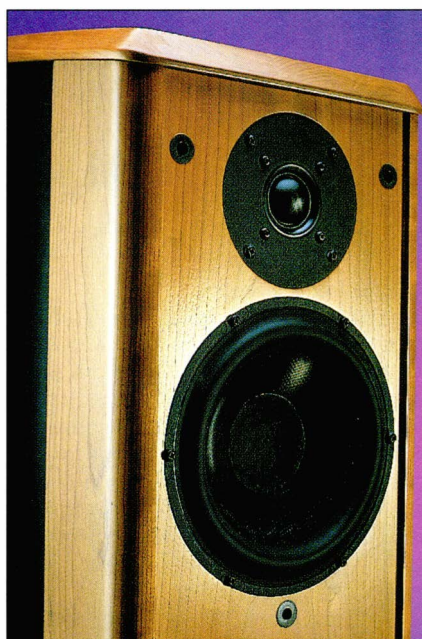
Wilson benesch, a British company based in Sheffield, appears to have its finger firmly on the pulse of leading-edge materials technology. In previous turntable and loudspeaker products, Wb's savoir-faire has been demonstrated by the use of carbon fibre. Its latest offering surprises all commentators by not employing a scrap of that rather expensive stuff. Instead, the Orator loudspeaker utilises a rather unusual variation on the theme of polypropylene.

This inexpensive but versatile plastic has found applications in everything from dustbins to speaker cones; in the latter guise it has proved durable if not particularly spectacular in the sound quality stakes. Hence the learned eyebrows raised on discovery of Wilson benesch getting so excited about a polyprop-coned main drive unit.

However, this isn't any old remould we have here. In fact, the cone benefits from a woven construction that's been compressed for rigidity. It was designed at Leeds University under the auspices of Professor Ian Ward, a director of Vantage Polymers which now produces the article in question.

The process of weaving polypropylene effects a four times increase in its stiffness, and when this characteristic is taken in combination with its lightweight and high self-damping properties, it starts to look much more appropriate for high-fidelity applications. Furthermore, Wilson benesch is so impressed with these cones that it plans to install them across the whole of its speaker range, including the three-way A.C.T. One and Actor designs.

There are also plans afoot to make



Wb Orator: shiny but plant unfriendly.

machined aluminium drive-unit 'baskets' with narrow struts, to allow maximum airflow from the back. However, this luxury, dubbed *Tactic*, will be reserved for the forthcoming Bishop speaker — a £10k+ model due to be launched at this month's High End show in Frankfurt, Germany.

### Streamlined and ligneous

With a price-tag of £2,700, the stylish, floorstanding Orator is Wilson benesch's least expensive speaker to date. In effect, it is a two-way version of the Actor (*HFC 169*), featuring the same curved sides and the reflex-loading port positioned in a gap between the plinth and the base of the speaker. The unusual, attractive shape, with its sloping crown to discourage pot plants and other paraphernalia, is derived from the A.C.T. One (*HFC 162*). Its flowing lines are

designed specifically to dissipate internal standing waves created by the rearward output of the cone. In a conventional parallel-sided box, internal damping is required to inhibit these unwanted sonic reflections.

With solid wood on its top and sides, and real-wood veneers elsewhere, the Orator manages to remain elegant even though it stands 10 centimetres over a metre tall without spikes. Other statistics include 23cm width, 34cm depth, 25kg mass and (claimed) 88dB/W sensitivity. The driver array comprises the 130mm mid/bass unit with paper dust cap, and a 25mm soft dome tweeter. Cable connections are made via appropriately chunky, gold-plated terminals, and while on delivery these bi-wire sockets are connected with bars to allow for single wiring, they can be removed easily with a 13mm spanner.

### Performing righteously

By one of those rare quirks of serendipity, the Orator followed a pair of ProAc Response 2.5 in my listening room. These two speaker designs are very similar in price and ambition, so much so that I couldn't have wished for a more appropriate reference point by which to judge the new arrival. Making life more difficult, however, was the fact that they have such polarised sonic signatures, so I'll refrain from judging one superior to the other. In a nutshell the Response 2.5 is smooth, relaxed, but by no means lazy; while the Orator has an up-front enthusiasm that seems almost cheeky by comparison.

The new cone seems to have some appealing qualities, the most obvious being speed. The DNM PA-3 power amp (*HFC 176*) and gorgeous Nagra PL-P preamp (*HFC 178*) were happy to exploit this characteristic. Replayed through this rig, the *Made in Japan* version of Deep Purple's *Highway Star* produced one of the most energised performances I've encountered

with a direct-radiating loudspeaker. The Orator is up there with Rehdeko for recreating the excitement of live music, but without the latter's rather extreme balance.

The Orator's bass is rather good as well. Again it is very quick, but it doesn't lack depth or, dare I say it, slam. The Orator is very revealing, portraying all the energy of guitars and cymbals, but underpinning them with bass guitar and kick drum. It's an extremely entertaining combination that reveals in great recordings, and when partnered with the SME Model 20 turntable or Pioneer DV-505 DVD player (*Ear Waxings*, HFC 178), and the amplification mentioned above, these Northern beauties revealed more of the age, style and quality of recordings than many speakers I've used. The Nagra preamp undoubtedly contributed in this respect as well, but nevertheless there are plenty of expensive speakers that wouldn't have worked so well.

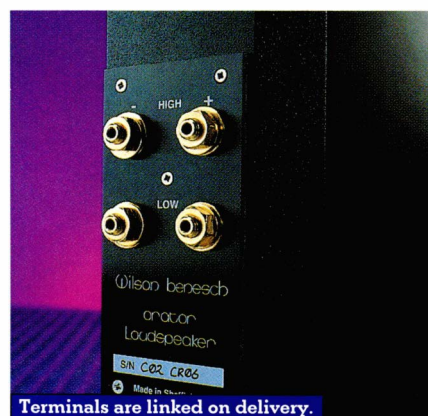
Occasionally the bass became a little wayward, but I would fight shy of ascribing this to the speaker without first having experimented in different rooms and with a greater selection of power amplifiers.

By way of a contrast I substituted the Orator for the Acoustic Precision Eikos FR1 (HFC 172), which is less of a powerhouse and certainly less capable at low frequencies, though its fabled 'midband coherence' does tend to steal the show. With the Orator I was very aware of a full and organic sound. In partnership with the Siemel amps reviewed on p53, the Orator whipped up a rather more energetic but not fatiguing performance.

### Conclusion

In many respects I found this attractive floor-stander to be more thrill-packed than its stablemate the A.C.T. One. While the latter is incredibly clean and revealing, it didn't quite have the energy to recreate live music to the full. It will be interesting to hear how it changes when Wb fits the Vantage Polymers cone — the results should be superb. In the meantime, the Orator appears to be a remarkably open door on your music: it's revealing and responsive. Spoil it with fantastic CD players, amps and cables, and it will spoil you with fantastic sound! ▲

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# French Polish

Jason Kennedy extends the entente cordiale, in this encounter with a top-spec French pre/power amp.

**W**hen asked to name the kind of goods manufactured in France, most people will say food or wine. I doubt whether many respondents outside the audio industry would include hi-fi. But investigation soon turns up names like Micromega, Pierre Lurné/Audiomeca, Cabasse, JM Lab and Rehdeko. What's more, the ranks of French-fi are swelling with new names like Helios and now Siemel, the latter of which supplies the well-made preamp and power amp under consideration here.

Siemel Industries has been in business since 1986, but only recently forayed into the hi-fi market. It is better known as a precision electronics company, producing a range of solid-state and tube-powered electronics using high-spec, custom-made parts housed in sturdy casework. These are certainly the first amps I've encountered for a long while to have been equipped with metal feet, for example.

## Built to last

The £1,650 TU-10 preamp utilises three valves deployed in a no-frills, line-level design. Lurking under the stylishly perforated bonnet reside ECC86 and 88 valves running at what is claimed to be a low plate temperature, to increase reliability and life expectancy. There is DC regulation for stability, according to Siemel, and a shelled mains transformer to reduce noise.

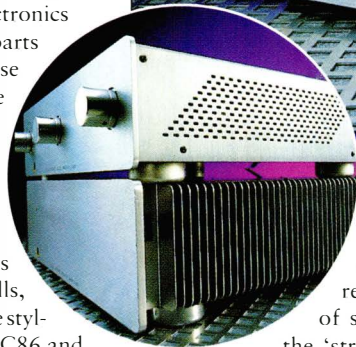
The volume pot is a Japanese Noble unit, and the components are said to be of military specification throughout. This is quite an unusual but nonetheless welcome feature at the price — and better still, in both pre and power amp the circuit board is a double-sided item crammed with high-grade components.

The TA-20 power amp (£2,450) is a dual-mono design that runs a single Mosfet output stage per channel. The maker claims this produces 60 Watts into eight Ohms and 90 Watts into four Ohms, in class AB — does this not render the full length heatsinks a shade excessive? Well, the maker justifies them on the grounds of stability and reliability. Do these folk know something that we don't about the fallibility of electronics? They even encourage users to turn off the amp when it's not in use! Still, with all those ultrapukka components under the hood, maybe these Siemel boxes do warm up as quickly as a Mirage fighter taking off on afterburners.

Facilities on the TU-10 are basic. There



Siemel TU-10 (top) and TA-20 pre/power amp. French-fi with finesse!



are five inputs and two sets of outputs, one serving a tape recorder. A minimum of switches completes the 'straight line' philosophy. There's not even a tape-monitor switch on this solid unit.

## Siemelly behaviour

Slotting into l'hi-fi chez Kennedy, Siemel gear had a hard act to follow in the form of DNM's considerably dearer 3C Twin/PA-3 pre/power pairing. However, the preamp at least managed to maintain a brave face after the transition. It smoothed out the sound a little, but enhanced timbre to compensate and retained much of the 3C's imaging and timing qualities. The TA-20 effected a rather less successful transition, due to its slightly perceptible 'electric' character and flat imaging striking a contrast with the subtlety of the DNM's. Once the Siemel rig had been in service for a few days, however, it wasn't difficult to appreciate its energy and dynamism.

Over an extended appraisal, I found the Gallic duo to be most capable and keen, without becoming at all overbearing or brash. I used both Wilson benesch Orator

(see review, p50) and AP Eikos FR1 speakers, and observed engaging results with both. The system revelled in jazz and other small-scale acoustic works. The Siemel preamp's tubes give it an edge with dynamics and timbre, and I suspect the preamp could reach even greater heights of performance in the company of a better power amp. I would rather have a subtle sound than an enthusiastic one any day; but a Naim enthusiast might find this power amp almost laid-back.

Given the otherwise bomb-proof appearance and performance of the Siemel components, I was surprised to encounter a low-level but noticeable buzz in the speakers at certain times. Radio-frequency interference, perhaps?

## Conclusion

The Siemel TU-10/TA-20 would be ideal for those who believe hi-fi should be manufactured to high standards, yet at a realistic price. In constructional terms alone, it looks like better value than imports suffering from an unfavourable currency exchange rate. For my money, the preamp is the better buy of the pair, but perhaps in more sympathetic surroundings the power amp would be a match for the competition. I won't be rushing out to order a set of Siemels — but neither will I be encouraging the distributor to come and collect... ▲ Kronos Distribution ☎ (01868) 748632



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# Cylinder head

Musical Fidelity's X series has wowed audiophiles with chic, compact style. Now, as **Alvin Gold** discovers, a battleship amp puts muscle on the bone.

**W**ith the new, 200-Watt X-A200 monobloks, Musical Fidelity's unique 'X' series of components takes another step away from its humble beginnings in the X10-D 'CD enhancer' (HFC 158). At £1,000 per pair, the X-A200 costs twice as much as the company's 'entry-level' X-A50 monoblok. According to the manufacturer, the '200 delivers four times the power of the '50, natch; its tubular alloy extrusion is about four times the size of the X10-D.

At the outset, I expected a bigger, more muscle-bound variation on the X-A50 theme. I was wrong. The X-A200 is made of altogether sterner stuff!

Here are the points of similarity. They're both tubular, but not tube-powered, and offer minimal features. Also, there are 'daisychain' link sockets allowing the connection of additional power amps for bi-amplification.

As underlined in Stan Vincent's *Statements* review (HFC 169), the X-A50 itself is an exceptionally fine amplifier. Moreover, on Paul Miller's laboratory bench, our review sample proved itself powerful beyond its specifications. The X-A200 is in a very different league, both qualitatively and quantitatively. It sounds more powerful yet also more disciplined, not just when tooling along at high volume with power-hungry speakers, but also, crucially, when used with Musical Fidelity's own high-sensitivity Kelly Transducers KT3 speakers (HFC 174) at more moderate levels.

Of course, as its output begins to increase, the X-A200 shows its sibling an even cleaner set of heels. However, it impresses most in areas where power output should not be an issue at all: when partnering loudspeakers specifically designed not to make excessive demands of power amplifiers.

## 200 steps to heaven

I auditioned the X-A200 with a Copland CTA-266 CD player, CTA-301 preamp and the Neat Petite 3/Gravitas passive stereo satellite/subwoofer speaker system. Also deployed were less esoteric components from the Musical Fidelity stable. Recordings included the Simon Rattle *Mahler 6* on EMI,



MF X-A200: offers 30A of peak current and is "unconditionally" stable.



the Tony Faulkner recording of Mozart's *Wind Serenade* for BBC Music Magazine, and the Benny Goodman *Copland Clarinet Concerto* on CBS.

You might reasonably enquire what makes the X-A200 so different. Well, the maker claims that it is essentially unclipable at the input, unconditionally stable into any load, and that it has low distortion even outside the audio band. He also claims that it will supply around 30 amps of peak current, and offers a low output impedance.

I can say that the X-A200 sounds more like a slightly reined-in version of the power amp section found in MF's A 1001 (the better half of that killer design, reviewed in HFC 172). More so, in fact, than any other Musical Fidelity product that springs to mind.

It's a big, bold, potent amplifier, but also much subtler and more organic than its smaller brother. That Copland clarinet sound, for example, has real heart through the '200. There's an old cliché about hi-fi reviewers always discovering new facets to existing recordings, but forgive me if I dust it off again here, especially with reference to

some performances I would previously have pigeonholed as familiar, including the Mahler, where the woodwind and brass sections snapped into focus. The lower midband sounded remarkably articulate and refined, as did the bass, whose combination of reach, power and presence was quite extraordinary. The X-A200's treble was also clearly several notches up the pole from the X-A50.

Remarkably, these monobloks bear comparisons with some of the finest valve-based amps I've heard, in terms of sweetness and variety of tonal colour. Better still, the MFs achieve this without exhibiting the almost subliminal loss of articulation and independence between instruments and voices which is the drawback of valve-based hardware.

There is more to the X-A200 than meets the eye and ear; and it shows a much more upmarket side to the X series. The only question remaining is the choice of partnering preamp. MF's own £200 X-PRE is a possibility, though it is dwarfed physically (and probably sonically) by the monoblok. Perhaps something from MF's forthcoming X-A series, or its high-end Nu-Vista range, will prove a worthy suitor. In the meantime, though, there is a more pressing problem. Where is the £1,000 coming from? ▲

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CHFC 806A

# BOSS BASS BOXES

Paul Messenger tests six subwoofers, priced below £1,000.  
Can they enhance music as well as movies?

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If you're using small speakers at present, they may well be placed close to the wall. Courtesy of the physical laws underpinning acoustics, proximity to a room boundary permits a small enclosure to generate a reasonable amount of bass. If augmented by a subwoofer, though, a small-box speaker can be brought out from the wall by two or three feet, which should improve midband clarity, reduce coloration, and provide better stereo imaging, too.

*Hi-Fi Choice* columnist Jimmy Hughes has often described a rather intriguing consequence of adding a subwoofer to his system: it seemed to sweeten the treble. This unlikely observation may, I suspect, have to do with the way the ears perceive the bass-to-treble balance of a system. Specifically, how the extreme bottom and top notes need to balance each other.

The designer of a small speaker has the very difficult task of picking the 'right' treble level. Go for a bright balance and the mid-band sounds open, the top a bit too thin. Pull down the treble level, and the overall balance may sound better, but the top end will tend

## THE CAST LIST

Acoustic Energy AE 108S . . .	£299.00	. . .	p61
B&W ASW1000 . . . . .	£499.95	. . .	p62
JPW SW60 . . . . .	£349.99	. . .	p63
M&K MX-70 . . . . .	£899.99	. . .	p64
REL Q50 . . . . .	£375.00	. . .	p65
Velodyne VA-1012XII . . . . .	£699.99	. . .	p66

to sound a bit shut in. Certainly, a small speaker is likely to sound sweeter and better balanced when it's supplemented by a subwoofer in the lowest frequencies.

## Improving with age

Subwoofers have been around for at least 20 years, though the UK market has been slow to recognise their charms, which is quite surprising given the British penchant for tiny loudspeakers. However, the comparatively recent arrival of home-cinema sound systems has given the subwoofer concept a major boost, transforming it from a niche interest into a glamour product almost overnight. Naturally, this has sounded a clarion call for all and sundry to jump on the sub-bass bandwagon, often with products that don't work too well.

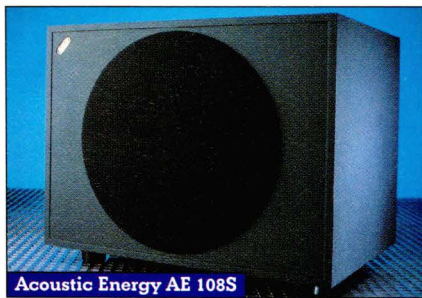
*Hi-Fi Choice's* two previous detailed examinations of subwoofers (*HFCs* 128 and 154) took place when the market was quite immature. Nevertheless, those earlier reviews provide a good historical perspective by which to judge the current crop on test.

In *HFC* 128, we checked out designs, both active (powered by an internal amp) and passive (unpowered, driven from the main amp). Almost without exception, the results of the latter test made it quite clear that the latter variety was best avoided: low price is the passive sub's only true advantage. Genuinely deep bass is rarely on their agenda, and usually they present a partnering amp with a difficult load to drive. Four years later, the passive subs seem to be fading into the obscurity they deserve. However, in the active sub arena, sharp competition between rival brands appears to be steadily driving down the price of entry.

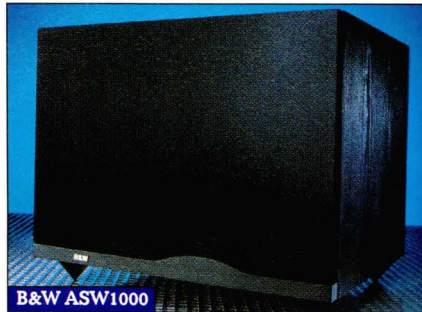
This group test takes a close look at six potentially interesting contenders, all below the £1,000 mark. Most are newcomers, all are actively driven, and we set out specifically to assess their performance with music, not movies.

A few years ago, you'd have struggled to find a decent active sub costing less than £500. This time around, though, three of our half-dozen come in at below £400, and the Acoustic Energy AE 108S even breaks the £300 barrier. The three more costly models should typify the treats in store for those who can pay a little more. At the top end of the market, models costing thousands of pounds approach the state of the bass art.

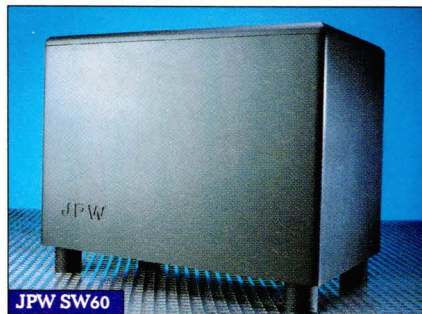
By and large, you usually get what you pay for, especially from the specialist subwoofer brands, which offer a wide range of models



Acoustic Energy AE 108S



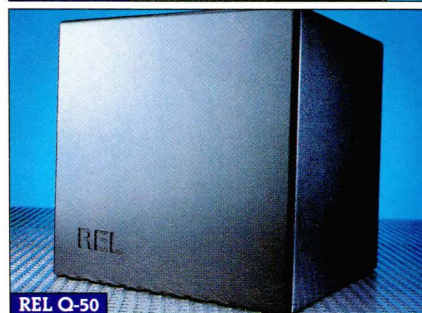
B&W ASW1000



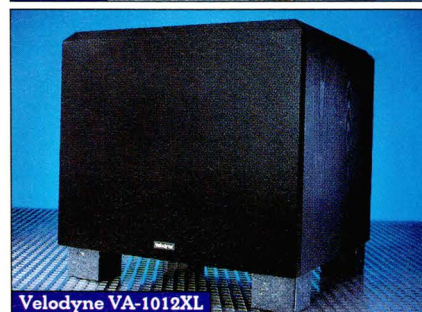
JPW SW60



M&K MX-70



REL Q-50



Velodyne VA-1012XL

across a broad range of prices. While bass freaks (including yours truly) love the sheer weight and gravitas offered by expensive subs, readers must judge for themselves just how much to spend on a component whose activity is limited to the bottom-and-a-half octaves of the audio spectrum.

### Good connections

Would-be bass augmenters should consider whether to use a subwoofer to supplement a pair of main speakers, or to have it take over completely from the main speakers through the bass region. Musical purists favour the former; the latter will appeal to movie fans in search of welly and impact — especially if main speakers are small.

Our test programme deliberately focuses on the 'supplementary sub', as any design can be used in this way, and the configuration appears to work best for musical reproduction. However, many subwoofers will undertake to extract the bottom couple of octaves from amplified musical signals, and pass on a bass-lean feed to the main speakers. This takes the form of a 'high-pass filter' output, either via speaker terminals and/or line-out sockets. Usually it will improve the power handling and loudness capabilities of a hi-fi system. It may also give better integration between subwoofer and satellites; but any form of filtering introduces phase changes that are fundamentally undesirable. The electronics within the subwoofer itself are regarded with some suspicion by serious hi-fi enthusiasts.

Since all the subwoofers in the test include line-input and speaker-input terminals, the second issue is whether you should connect a subwoofer to the main speaker wiring of your system, or directly to a preamplifier's line-output sockets. Circumstances may well dictate the former course of action, as many integrated amplifiers don't have pre-out sockets, and tape-out sockets don't work because they operate at fixed level.

On the other hand, if you're using a separate pre-/power amp combo with monoblok power amps, you should avoid the speaker terminals and opt for line-level connections between preamp and sub. The pre-out/line-in connection involves the shortest signal path, but some believe that incorporating power amps (and even speaker cables) into the sub feed, improves overall system integration. Feel free to experiment!

### Where to put your subwoofer

The first Golden Rule is to experiment with positioning. Point any drive units or enclosure-loading orifices away from listeners, if the design doesn't already direct them towards the floor. Try placing a sub between your main speakers, and at the same distance from the listening position. Don't be afraid to move the sub closer to you, as that can sometimes improve the blend between sub and sats.

Don't forget the sub's phase switch. This permits you to choose between operation 'in phase' or 'out of phase' with the main speakers.

Selecting 'in phase' makes the sub's cone move in step with the satellite speaker's mid/bass cone; 'out of phase' means that when the sat's cone moves forward, the sub's cone goes backwards. This enables the listener to account for acoustic peculiarities of the listening room (see feature on p50 of *HFC* 167 for more info). More often than not, you should go for the setting that gives the most midbass output.

A subwoofer's proximity to the floor is taken for granted, though it's not necessarily desirable. Placing a sub close to walls will have a considerable effect on the inevitable 'ups' and 'downs' through the bass region, caused by a listening room's characteristics. Avoid the corners and try to avoid placing a sub the same distance from any two walls.

### HOW THE TESTS WERE DONE

It is very difficult to audition a subwoofer in order to assess its innate sonic qualities. It's pointless listening to such a device on its own, since it is only relevant when used in conjunction with a pair of standard loudspeakers (satellites).

As always in hi-fi, the end results with subwoofers depend considerably on how well they are installed and set up. For this reason, prior to auditioning, we spent a substantial amount of time tweaking performance parameters, balancing the relative output levels of subwoofer and satellite, and attempting to optimise the degree of integration between them. Both objective and subjective checks helped me to determine the right phase setting, output level and roll-off for each subwoofer on test.

Our objective was to assess each model's performance when reproducing music, in conjunction with a high-quality stereo hi-fi system, which uses small main loudspeakers. Rega Kyles, placed on Kudos S100 stands, proved ideal for this purpose, as their light, bright balance responds well to some bass reinforcement. Amplification and signal sources were mostly from Naim Audio and Linn Products.

Auditioning took place over a two-week period, using a wide variety of sources and music, as the subliminal reaction to extended listening is usually more meaningful than formal sequential presentations. However, we did the latter as well, using a selection of material chosen deliberately to stress the bass capabilities of any system. Key tracks included the Prodigy's *Breathe* (from *The Fat Of The Land*, XLLP 121); The Chemical Brothers' *Where Do I Begin?* and *The Private Psychedelic Reel* (from *Dig Your Own Hole*, XDUST CD2); and *The Fun Lovin' Criminal* (from *Fun Lovin' Criminals' Come Find Yourself* CDCHR6113). I also used some early mixdowns of forthcoming tracks from Ron Wells and Paul Frazer Clarke, kindly supplied by Mana Acoustics (see *Inspirations*, *HFC* 177, pp27–29).

### MESSENGER'S MEASUREMENTS

We took a number of informal measurements: to examine the nearfield tonal balance of the subwoofers on test; to explore their power handling; plus, especially, to establish their roll-off characteristics (how sound output changes with frequency), and the options offered by their high-pass filters.

Also, we conducted far-field response sweeps, which provide invaluable assistance when you're deciding on the best site for a subwoofer, and setting parameters for optimum integration (blending) with the chosen satellites.

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Q Magazine, Robert Mills, May 1997



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- ▼ CONS: A right royal pain to clean and dust

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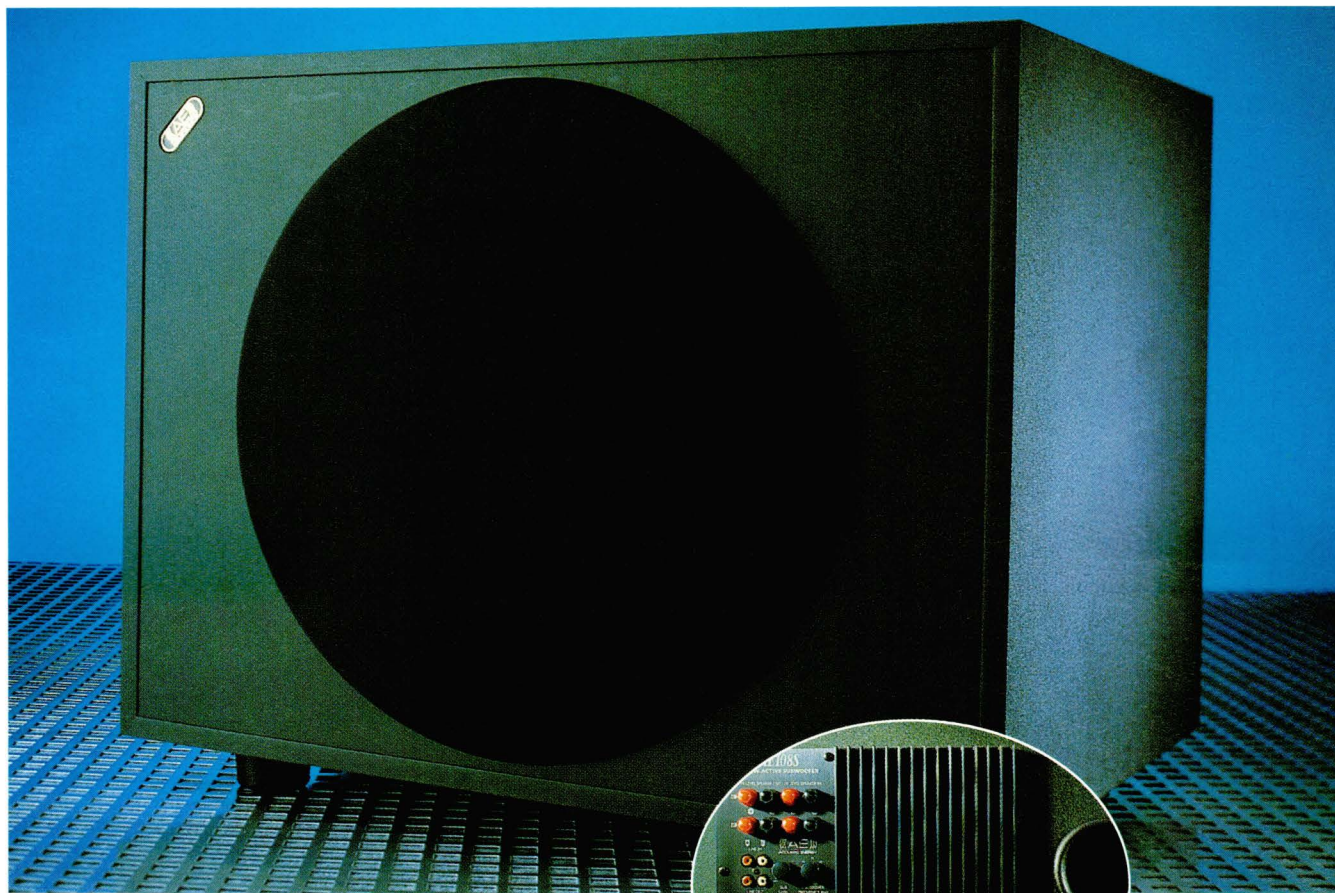
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### ACOUSTIC ENERGY AE108S

About 10 years ago, Acoustic Energy became famous for its upmarket, metal-coned miniature speakers. In the last couple of years, however, the brand has re-invented itself as a mass-market, high-value-for-money player, with considerable success. To the best of our knowledge, this is the company's first foray into the realms of subwoofery, and the £299 AE108S has one obvious advantage over others in this group test: it's £50 cheaper than its closest rival. The latter is hard to guess from inspection alone, for this is neither the largest, nor the heaviest model in the group; nor the smallest nor lightest. In fact, it's quite generously built, and tilts the scales at around 20kg. However, it isn't the prettiest package around, with an anonymous, textured black finish. There's no chamfering to soften the edges, which makes this bulky box appear old-fashioned.

However, you should get plenty of bang for your bucks. The power amplifier is claimed to deliver 150 Watts into eight Ohms; the drive-unit is one of the largest in the group (with a 240mm flared-paper

cone), and there's a generous 65mm-diameter port, to add several penn'orth to the proceedings. The amplifier heatsink is generously-sized, but like the chunky eight-millimetre spikes for floor coupling, its edges are a bit sharp (rubber feet are supplied for users who would prefer a non-penetrative floor-coupling option).

The usual suspects populate the feature roster: on/off/auto and phase switches; roll-off frequencies variable, allegedly, between 40 and 100Hz; and a volume knob. Both inputs and outputs are available at both line and speaker levels. The high-pass outputs (ie those that are light in bass) are filtered at a nominal 100Hz. This means the AE108S may be used either to supplement the output of tiny satellite speakers, or complement the performance of bigger partners.

#### Sound quality

There were no problems achieving good integration between the Acoustic Energy subwoofer and the Rega Kyte satellite speakers. The AE's bass is certainly very well extended, sounding clean and clear, with bags of headroom, and exhibits a commendable freedom from strain. At the same time, however, it could have been crisper.

The bottom end thuds a bit and sounds slightly leaden-footed on material where the majority of drive and rhythm information is in the low-frequency area. To call it 'slow' would be too damning, but this model never seems to push music along in the manner of

some competitors. The AE108S is a much happier beast when it is supplying ample — nay, copious — grunt.

#### Conclusion

The AE 108S provides massive amounts of mid-bass energy, but not much of the really deep stuff. This would suggest that it will be better suited to movie enhancement than underpinning serious musical reproduction. That said, the unit offers unequivocally good material value for money, and in this test — being the least expensive subwoofer and also potentially one of the loudest — the AE108S certainly delivers by far the greatest ratio of bang to buck.

#### THE LAB REPORT

Nearfield measurements show that the AE 108S's low-pass filtering has a relatively gentle net roll-off, characteristic of around 16dB per octave, while the range of roll-off frequencies is about an octave.

The instruction leaflet states that this subwoofer is intended to serve a dual function, for music or home cinema soundtrack reproduction, but the measurement traces imply that it is rather better suited to home cinema applications.

Even at the lowest roll-off frequency, its output is strongest at around 70Hz, and the mid-bass octave of 45–90Hz is up to 6dB stronger than the 20Hz level. At the highest frequency roll-off setting, the 70Hz level is some 22dB stronger than that recorded at 20Hz. However, for sheer mid-bass bang, the AE108S is hard to beat.

#### ACOUSTIC ENERGY VERDICT

**SOUND** ★★☆☆☆  
**VALUE** ★★☆☆☆  
**PRICE** £299.99

(FIVE YEAR GUARANTEE)

☑ Lots of loud subwoofer for your money, though ultimately this unit is oriented more towards movie soundtracks than musical performances.

✉ Acoustic Energy Ltd, 16 Bridge Road, Cirencester, Gloucester GL7 1NJ  
 ☎ (01285) 654432



**B&W ASW1000**

Worthing-based B&W Loudspeakers has been involved in subwoofers for several years, and two previous models have come under this reviewer's scrutiny. Both acquitted themselves rather well; they were better than many rivals from other full-line speaker brands, but couldn't quite match the standards set by some subwoofer specialists.

The £500 ASW1000 hits precisely the same price-point as the AS6 covered in our last subwoofer round-up (*HFC* 154). It's more of a looker than its decidedly four-square predecessor, thanks to styling embellishments in the grille treatment, and a rather smart set of large cones provided for floor-coupling. However, it seems a shame that the beautifully-flared, intriguingly-dimpled reflex port is concealed on the underside, rather than displayed out front as a major styling feature.

The heavyweight construction and solid build are obvious aids to the subwoofer's

physically-challenging task (the total mass approaches 30kg). Only sharp box edges detract from initial impressions of good material value. Plenty of oomph ought to be assured by the 120-Watts-rated amp driving a shielded 12-inch driver (with 230mm doped paper cone). The dimpled port measures a whopping 100mm in diameter.

By way of controls there are the customary on/off/auto and phase switches, plus adjustment for roll-off frequency (said to be variable between 40 and 140Hz), and a volume knob. Inputs and outputs are supplied at line and speaker levels. The outputs incorporate high-pass filtering, to increase power handling and loudness capability. The line-level output has third-order filtering, while the speaker-level output has a first-order filter, both with a nominal filter frequency of 80Hz.

**Sound quality**

First impressions were a bit disappointing. The ASW1000 seemed to supply more in the way of weight and power than a sense of purpose. Also, there was too much emphasis on mid-bass rather than true deep bass.

But with the low-pass filter set to its lowest possible position, it fared much better, supplying genuine weight with delicacy, as well as ample headroom. There did appear to be some slight thickening of sound textures, but this could be ascribed to the energy being pumped into the floor by that large down-facing port.

**Conclusion**

There's no denying the ASW1000's enormous power reserves and ample headroom. However, such loudness capability is unnecessary for a subwoofer reproducing music programme in conjunction with any average/above-average sensitivity main speakers. Nonetheless, this is a thoroughly competent design, and decent value too, though maybe it's not ideally suited to use in rooms with suspended wooden floors.

**THE LAB REPORT**

The low-pass filtering has a relatively steep net roll-off characteristic of around 30dB per octave, while the range of roll-off frequency options is unusually wide, spanning a full octave and a half.

The impressively comprehensive manual states that this subwoofer is intended for music or home cinema soundtrack reproduction, though, as with the Acoustic Energy, most of the filter settings seem to favour movies. However, when set to its lowest possible roll-off frequency, the ASW1000's output is pretty solid below 55Hz, and curtailed quite rapidly above that point, which should make for good compatibility with small satellite speakers and music reproduction.

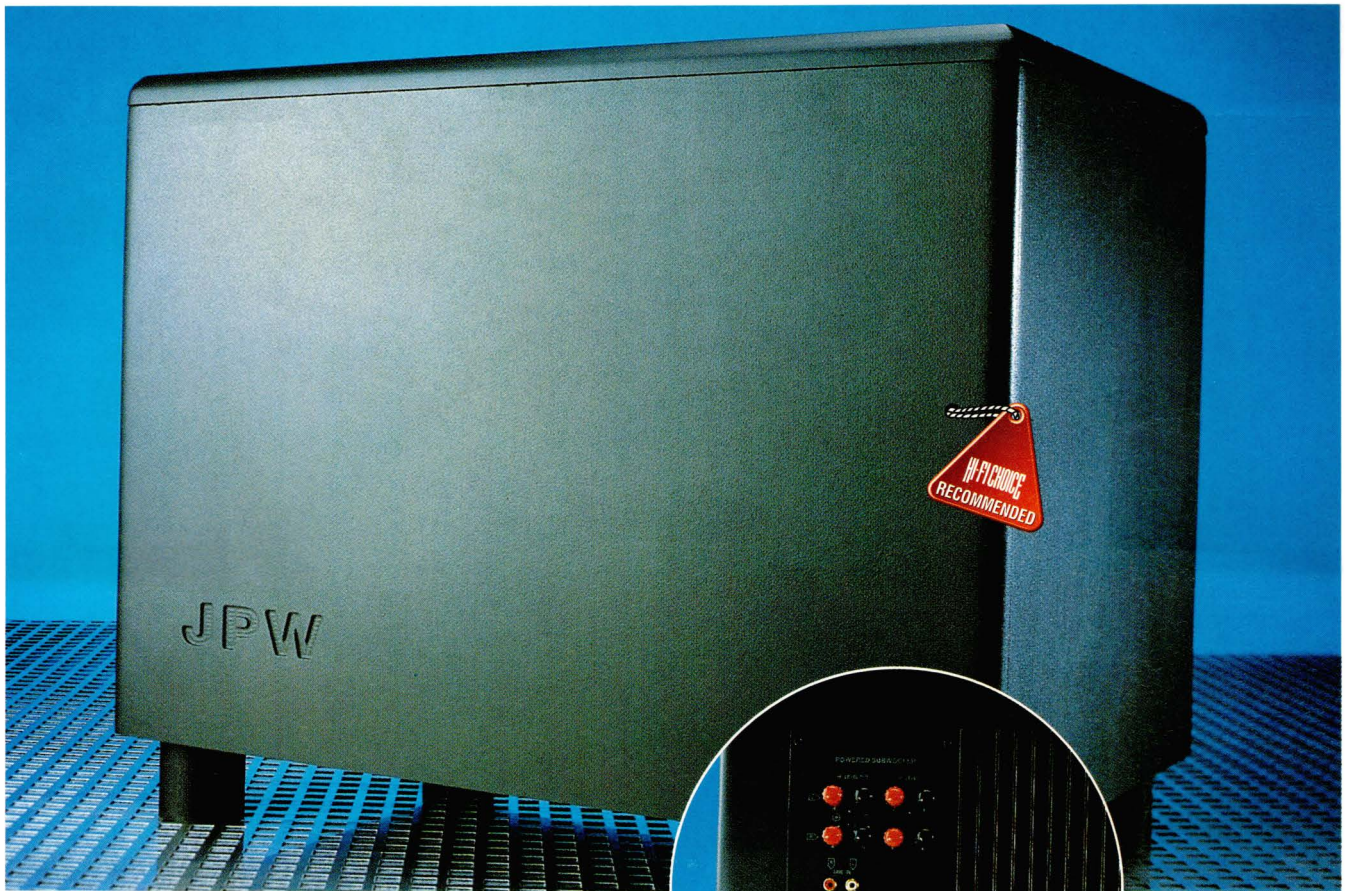
Setting the roll-off frequency above the minimum starts to take the ASW1000 into home cinema country. At the mid-point setting, 60-70Hz output is 10dB stronger than before, while the 20Hz output remains the same. In terms of maximum loudness potential, this subwoofer's probably the best in the test.

**B&W VERDICT**

- SOUND** ★★★★★☆
- VALUE** ★★★★★☆
- PRICE** £449.95

**(FIVE YEAR GUARANTEE)**

☐ Lots of loud subwoofer for your money, though it's better suited to movies rather than music.  
 ✉ B&W Loudspeakers, Marlborough Road, Churchill Ind Est, Lancing, W. Sussex BN15 8TR  
 ☎ (01903) 750750



### JPW SW60

JPW has become well known as a high-value-for-money (read: low-priced) brand, due in no small part to its exclusive distribution in the UK via the cost-conscious Richer Sounds chain. The SW60, to our knowledge, is the company's first active subwoofer (we'll draw a veil over earlier passive indiscretions), and there's no denying you get a whole lot of speaker for your money here — close to 30kg in weight alone.

The styling cues are borrowed from JPW's recently launched Millennium series of conventional hi-fi speakers, but, as usual, there's not much you can do to enliven a large, four-square box. The product is a testament to the aesthetics of textured MDF, which is relieved by some grooves, and finished with more grey and less black than some rivals. There's a set of metal feet and chunky eight-millimetre spikes to screw into them. These lift the base off the ground to create breathing space for the drive-unit and reflex port. This makes plenty of sense, because the JPW features the most gentle roll-off-filter characteristics of any model in our group. As

the drive-unit is pointing towards the carpet, this should help absorb unwanted midrange output.

Features include on/off/auto and phase switches, plus roll-off frequencies said to be variable between 40 and 170Hz, and a volume knob. Rated power output is 60 Watts. Inputs and outputs can be supplied at both line and speaker levels; the separate speaker outputs (but not the line outputs) incorporate high-pass filtering (frequency/rate unspecified). As explained in the introduction, this should increase system power handling and loudness capability, by removing the low frequencies from the signal before the satellite speakers receive it.

### Sound quality

The JPW sounds impressively transparent, integrates well with its satellites, and seems to have its colorations under tight control. It goes about its business without fuss, just as a good sub should. However, while there's not much to criticise in its performance, it didn't quite set the pulse racing, either.

Whether it was a consequence of the ten-inch main driver, the port loading, or the downward radiation causing excessive floor excitation, the SW60's weighty sound is compromised by a lack of grip and dramatic tension. It's very even handed, and its rhythmic timing is pretty good, but there's a slightly thuddy quality, and a sense of some thickening and sluggishness.

### Conclusion

JPW's SW60 is a solid all-round performer, indeed a real heavyweight at the modest price of £350 — good material value for money. The sound is clean and transparent, if perhaps a little understated when providing the driving foundation for modern dance music. The roll-off filter is usefully flexible, and the unit should provide good results with movie soundtracks as well as music.

### THE LAB REPORT

The JPW exhibits a relatively gentle high-frequency roll-off, of just 12dB per octave, which should minimise abrupt phase changes as the filter comes in. However, by the same token, the gentle slope will result in greater overlap between subwoofer and main speakers. Furthermore, compared to other models in this test, it has one of the most flexible filters in terms of roll-off frequency, which covers roughly two octaves. But it's a moot point whether the upper settings have much practical value.

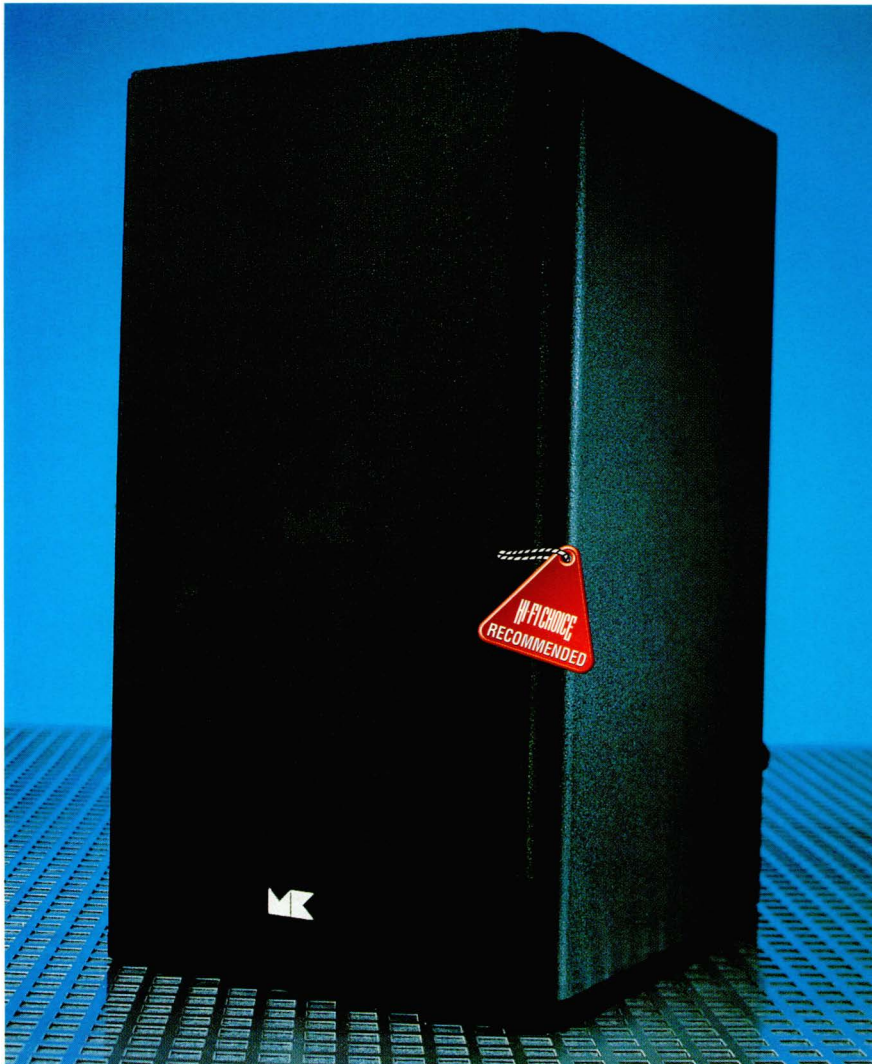
The smoothness of the nearfield response is especially impressive, particularly for a ported system, showing just how well driver and port are integrated. And the minimum setting of the filter would seem likely to work well in a hi-fi music context, showing a maximum output of between 30–40Hz, and -3dB at 20Hz/50Hz. Higher frequency settings may still be usable, but these are moving progressively towards the needs of a home cinema subwoofer — the maximum setting gives peak output of 50–125Hz, with 20Hz at -12dB.

### JPW VERDICT

**SOUND** ★★★★★☆  
**VALUE** ★★★★★☆  
**PRICE** £349.99

(ONE YEAR GUARANTEE)

- ☐ A real heavyweight for £350, the SW60 sounds clean and transparent, if perhaps a little understated. Usefully flexible.
- ✉ Hi-Fi Direct, Richer House, Hankey Place, London SE1 4BB
- ☎ (0171) 940 2240



**MILLER & KREISEL MX-70**

Miller & Kreisel (M&K) is a US subwoofer specialist whose wide range of models has been available in Britain for several years. A number of products have come the way of this reviewer, and each has impressed with high standards of performance and overall credibility, even though their prices have tended to appear rather high, purely in terms of perceived material value for money.

The latter misgiving certainly rears its head on consideration of the MX-70 reviewed here. At £900, it costs three times as much as the least expensive model in the group, yet it's only about a third of the size. It exhibits close parallels with its even smaller sibling, the VX-7B, (HFC 154), which showed incontrovertibly that large size was by no means a prerequisite for genuinely deep bass reproduction. In a very real sense, the MX-70 is the next step up

from the VX-7B, with everything doubled up, including the price. Appraisals of its material worth should depend less on the basic ingredients than the performance it provides. The compact dimensions are surely a plus, not a minus, on the balance sheet. In fact, this subwoofer looks exactly like a large bookshelf-type loudspeaker, so elevation onto a stand is a feasible alternative to plonking it on the floor. Such action should yield a clear benefit in reducing the unit's liability to excite boomy 'standing waves' between the floor and ceiling of the listening room.

The MX-70 achieves its slim profile by incorporating a much smaller drive unit than its rivals. However, it makes up for the consequent shortfall in cone radiating area by using not one but two drivers. Overall, there's still less cone real-estate available than you'd find in a 12-inch driver, but there's more than a single ten-inch drive unit could provide. Another ploy by M&K is to mount the two cones and chassis at mutual right angles to each other; the better to cancel distortion. Smaller enclosure panels should generate less box coloration, too.

The feature roster includes on/off and phase switches, a volume knob, plus roll-off frequency, said to be adjustable between 50 and 125Hz. Inputs are supplied at both line and speaker levels, and there are separate



speaker outputs incorporating high-pass filtering (at a nominal 80Hz). Power output is claimed to be 125 Watts.

**Sound quality**

Probably because it was the most compact and manoeuvrable of the bunch, the M&K was the first to strut its stuff. And, truth be told, it set a standard the other models struggled to approach.

Although the MX-70 may not have the deepest bass or provide the greatest impression of acoustic scale, it is unusually dynamically literate, sounding exceedingly lively and light on its feet. It's a subwoofer that doesn't sound like a subwoofer; simply and cleanly, it just supplies the extra bass lacking from small main speakers.

Great loudness is not on the agenda, but it was more than capable of partnering the average-sensitivity Rega speakers we used on this occasion.

**Conclusion**

It might look like a pricey proposition, but the MX-70 delivers performance that justifies its cost and belies its diminutive size: a great sense of agility and purpose make sense of the toughest material.

**THE LAB REPORT**

Nearfield measurements show an unusually well-tailored high-pass filter network, with an average roll-off characteristic of around 24dB per octave, while the range of optional roll-off frequencies covers about an octave.

The nearfield responses rise some 8dB between 20Hz and 40Hz, above which the lowest roll-off setting becomes active, recording -3dB at 60Hz and -12dB at 100Hz. At the middle setting the figures are -3dB at 80Hz and -12dB at 120Hz, while the nominal 125Hz setting gives -3dB at 125Hz and -12dB at 170Hz.

The output level from 40Hz up to the chosen roll-off point was unusually and impressively flat and smooth. Inevitably, in view of the ingredients, maximum viable output level was the lowest in the group, though acoustic output did remain very well controlled up to peak output.

**MILLER & KREISEL VERDICT**

**SOUND** ★★★★★  
**VALUE** ★★★★★☆  
**PRICE** £899.99

**(TWO YEAR GUARANTEE)**

- ☐ Justifies its cost and belies its diminutive size, with an agility that makes sense of the toughest material.
- ✉ Gecko Inc, 62 Hartley Old Road, Purley, Surrey, SR8 4HU
- ☎ (0181) 681 1817



## REL VERDICT

**SOUND** ★★★★★☆  
**VALUE** ★★★★★★  
**PRICE** £375.00

(TWO YEAR GUARANTEE)

- ☑ Genuinely deep, clean bass from an attractively compact and cost-effective package. Could have more dynamic drive.
- ✉ REL Acoustics Ltd, North Road, Bridgend Ind Est, Bridgend, Mid Glamorgan, CF31 3TP
- ☎ (01656) 768777

**REL Q50**

As far as we are aware, REL is the only British subwoofer specialist. It has been very successful at persuading UK customers to take subwoofers seriously for hi-fi; in fact, it has put the breed firmly on the shopping list of UK audiophiles, offering a broad range of models built up from this Q50, which is priced at £375.

The Q50 is the successor to the QBASS, which was included in our group test of *HFC* 154. A major reason for the renaming was REL's introduction of a slightly more expensive Q100 model, which is very similar to the Q50 but incorporates a significantly more powerful amplifier.

REL timed its arrival on the scene to coincide perfectly with the beginning of

home cinema activity. Undoubtedly, this has been commercially beneficial, but the company has always stressed that its subwoofers are, first and foremost, intended for hi-fi music reproduction. If they happen to work well with movie soundtracks, too, that's an added bonus.

Being offered on a 'music first' tip, the Q50 has no high-pass filter options, and, therefore, no output sockets. Inputs are provided for both speaker and line level signals, and the former may be funnelled into the sub through a usefully long lead, which REL supplies (at the subwoofer, it is terminated with a special Neutrik connector, which should prove quite durable.) Other features include the usual on/off/auto and phase switches, and volume control, while

the variable roll-off-frequency knob is only labelled 'min' and 'max'.

This unit is more compact than most of its rivals, and is good looking, too, in a cutely cuboid manner — all the sharp edges have been chamfered off. It's a sealed-box system, using a 12-inch driver with a 240mm flared-paper cone, operating in the stiffness region below its fundamental resonance (70Hz). The amplifier is rated at a rather modest 50 Watts, but is helpfully equipped with 'Set-Safe' protection circuitry. Six-millimetre spikes take care of floor coupling.

**Sound quality**

We were quite surprised, and pleased, by the considerable weight and scale conjured up by this very compact subwoofer. Its sound is commendably free of any mid-bass excess — unless you go looking for it with the filter control. Indeed, it sounded just a little bit lightweight here, which is very unusual.

Some listeners might prefer something warmer and more fruity, but there was an admirable freedom from chestiness on male voices. The Q50 sounds clean, agile and light on its spikes, though it doesn't quite match the dynamic tautness and tension of its more powerful brother, the Q100.

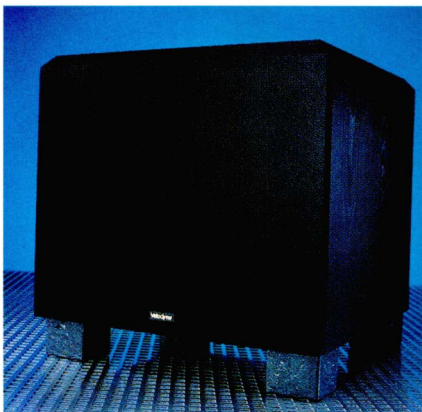
**Conclusion**

The Q50 stacks up very well against the competition here, delivering deep, clean bass in the context of a compact and cost-effective package. However, the modest amp is something of a limiting factor, so you might care to check out the more muscular Q100 sibling.

**THE LAB REPORT**

Nearfield measurements show that the ultimate roll-off rate of the Q-50's low-pass filter is around 25dB per octave, while users may choose from about an octave's worth of frequencies at which roll-off actually occurs. Unlike many of its rivals, the Q50 can deliver a virtually flat nearfield response through the bottom octave (20-40Hz), on its minimum setting, followed by a gentle roll-off to -3dB at 50Hz and -19dB at 100Hz. This characteristic should be very well suited to subtle reinforcement of many modern hi-fi speakers.

The middle filter setting also keeps emphasis on the low bass, giving a maximum output of between 30-60Hz, while the highest setting delivers peak output of 50-80Hz, but at a level 12db above the 20Hz datum. Given the sealed-box loading and modest amplifier power, maximum loudness was a little below the average. Output protection proved very effective.



**VELODYNE VA-1012XII**

Velodyne has a mean reputation on the other side of the Atlantic, as one of the key movers in a much bigger subwoofing game than we play here in Blighty. One of Velodyne's in-car subwoofers whetted this author's appetite for the brand a few months back. The asking price of £1,000 for a 12-inch drive unit was a bit steep, but the really clever bit was a servo-control 'black box', which used motion-sensing feedback to ensure absolutely linear performance, no matter how arduous the circumstances.

The high price-tags of Velodyne's domestic 'servo' subwoofers place them well above the relatively modest limits chosen for this group. Instead, we've got the rather more conventional VA-1012XII (£699), which is second from the top of a five-model range.

Even this model costs more than the group average, but I guess that's par for the course with a relatively exotic import — and at least Velodyne has made an honest attempt to imbue the sub

with more in the way of styling than most of the competition. Some nice chamfering breaks up the cuboid shape. The VA-1012XII sits on four little grey feet, to keep the base above ground level, and these are vital, despite the ten-inch (200mm) paper-coned drive unit mounted on one side of the cube. Underneath, there's an even larger (240mm) passive auxiliary bass radiator (ABR) diaphragm!

The feature line-up includes on/off/auto and phase controls, plus an extra switch, which removes the internal low-pass filter (for use in a Dolby Digital home cinema



system, where the 'LFE' line-level sub channel is already pre-filtered prior to output from the processor).

The roll-off frequency is quoted to be variable between 40 and 120Hz. Inputs and outputs may be made at both line and speaker levels, with both outputs incorporating high-pass filtering with selectable 80/100Hz options. The amplifier power output is quoted as 100 Watts.

Until recently, Velodyne's products have not been widely available in the UK. Since this review was commissioned, British distributor Sound Department has relinquished the account to concentrate on its traditional pro-audio business. However, it has undertaken to answer customer queries until a new distributor takes over.

**Sound quality**

The VA-1012XII has pretty good timing and some dynamic grip, but it doesn't really go deep enough to give the best results with music. So, while the sound has plenty of punch and drama, it does lack a little scale and authority, and when you factor in the premium price, the sound is disappointing.

In no way is the sonic performance obtru-

sive: the unit remains pretty self-effacing, tracking dynamics well and generating a measure of tension. A whole lot of floor-shaking occurred when the sub was driven hard — perhaps that had an effect on sound quality. On a solid floor rather than the suspended one in this author's listening room, perhaps there would be better results.

**Conclusion**

We were disappointed by this Velodyne model, given the company's fine reputation — though perhaps the real truth of the matter is that it's obviously tilted more towards home cinema applications than hi-fi. Distortion is low and there's loads of headroom, but floor excitation seemed quite severe.

**THE LAB REPORT**

Although Velodyne's publicity material implies the VA-1012XII is suitable for both music and movie media, the nearfield responses lean firmly in favour of the latter. The low-pass filter has a sharpish roll-off rate, something like 32dB/octave net, but the range of roll-off points amount to only a third of an octave (switching off the filter adds another third.)

Peak output varies from 50–70Hz (-8dB at 20Hz) to 55Hz–85Hz (-16dB at 20Hz) through the range of the filter. This characteristic certainly seems to owe more to home cinema than hi-fi. Maximum level capability is pretty good, and very clean with it, albeit with an emphasis on the mid-bass region. The large ABR shows an impressive ability to shake the floor!

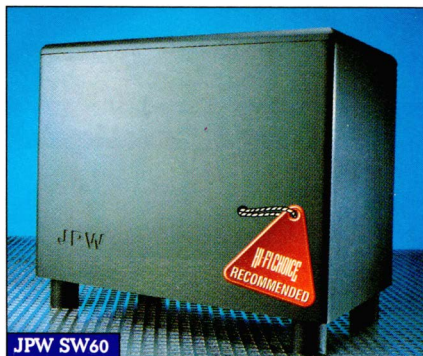
**VELODYNE VERDICT**

**SOUND** ★★★★★  
**VALUE** ★★★★★  
**PRICE** £699.99

**(FIVE YEAR GUARANTEE)**

☐ A real floor-shaker, but could delve a little deeper. Balance seems more movie-oriented than musical.  
 ☒ Sound Dept, 19 Blacklands Way, Abingdon Business Park, Abingdon, Oxon OX14 1DY  
 ☎ (01235) 555622

# Conclusions

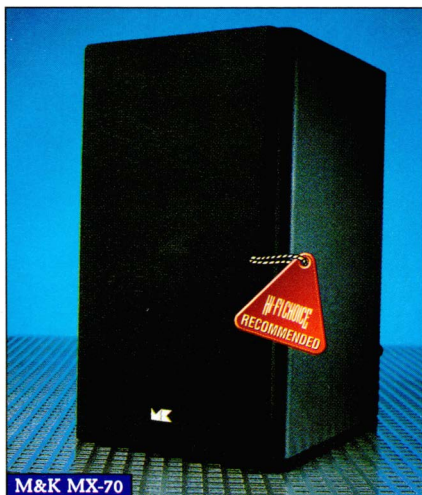


**S**ubwoofers have been getting better and cheaper over the past few years. The principal drawback of most designs is their need to fulfil a dual rôle for both hi-fi and home cinema applications. Regrettably, all too often, a sub thus destined favours one kind of system over another, but with a bit of persuasion, most modern designs now make a pretty decent fist of both tasks.

That's not to say there isn't room for improvement. Often there is a far-from-ideal degree of overlap between a subwoofer's operating range and the 'satellite' speakers in need of low-frequency augmentation. Most subs are more inclined to behave like resonators than to adopt the classic low-pass filter alignment. The honourable exception on this occasion was the Miller & Kreisel MX-70.

In most instances, increasing the roll-off frequency (at which the sub's output starts to tail off), also served to boost the mid or upper bass to several decibels above the low-bass output level. This is great for enhancing movie special effects, but is not ideal for music reproduction.

In the offerings from JPW, B&W and Velodyne, drive-units and/or ports point



down towards the ground. This might seem a logical strategy for both acoustical and mechanical reasons, but in practice this configuration seemed to cause an unwanted 'thickening' of bass textures, especially when playing loud. As mentioned in the texts of individual reviews, I suspect this phenomenon may have been caused by sympathetic vibrations in our listening room's suspended wooden floor. A concrete or stone floor should remove this potential source of colouration.

## Model by model results

At the first rung on the price ladder, the Acoustic Energy AE 108S offers a whole lot of subwoofer for just £300. It offers great potential for loudness, but the filter characteristic tends to emphasise the mid-bass, which is likely to appeal more to movie fans than music buffs.

The £350 JPW SW60 won't go quite as loud as the AE, but it is rather smoother and better controlled, with a filter characteristic that seems better adapted to music replay.

Smaller, cuter and only a little more expensive, the £375 REL Q50 is a star performer — as long as you have no desire to rattle the rafters. If grunt is on the agenda, check out the Q50's more muscular brother, the Q100, which should assure more dynamic tension.

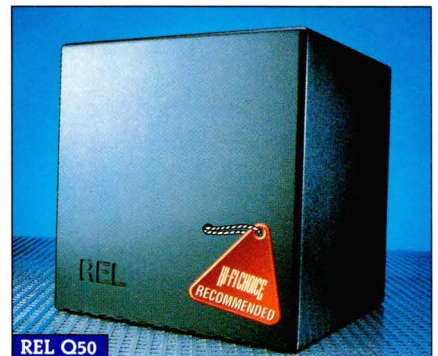
The £500 B&W ASW1000 is a big bruiser of a subwoofer, but its muscle is clothed within a real-wood cabinet finish, and its manners are assured by very competent all-round engineering. Genuine floor-shaking ability available here.

The Velodyne VA-1012XII is good looking but undeniably pricey at £700. However, it packs plenty of punch, possesses lots of headroom and floor-shaking ability, but lacks a little in portrayal of ultimate bass weight.

Though much smaller and more expensive than its rivals in this test, the £900 M&K MX-70 has an agility and dynamic literacy which belie its size. It may not go as loud as larger models, but it makes up for this in its eloquence of musical communication.

## Recommendations

Unlike our last subwoofer group test, conducted over two years ago now, this month's appraisal demonstrated a much higher standard of performance among the subwoofer breed. Not one model disappointed us, but three contestants nosed ahead of the pack to achieve Recommended status. (None was sufficiently stunning to warrant a Best Buy flag.) The top trio comprised JPW SW60, M&K MX-70 and REL Q50.



## HOW SUBWOOFERS WORK (AND DON'T WORK)

The human ear relies only upon midrange and high-frequency signals to discern the direction from which a sound emanates. In hi-fi, only these frequencies contribute to the perception of stereo imagery. Low frequency (bass) signals are comparatively hard for the ear and brain to locate, so can be reproduced by a dedicated enclosure physically separate from the main speakers — the subwoofer. This permits either the use of much smaller visible main speakers, or the generation of much higher volume levels from nominally 'full-range' speakers.

Usually, there is just one subwoofer — after all, bass is supposed to be nondirectional. However, some critical listeners maintain that two subs are essential for reproduction of authentic soundstages. Given the right combination of sub(s) and main speakers, it should be possible to achieve truly extended in-room bass with only a pair of miniature speakers visible. That's the positive aspect. In the debit column, some pundits call into question the pursuit of full frequency reproduction as the ultimate goal in hi-fi; what about the deleterious effects of phase swings in passive loudspeaker dividing networks? Even high-class 'normal' speakers don't manage this aspect of sound reproduction very well. Physically detaching the bottom end of the audio band, and delivering it from a single point elsewhere in the room, makes it almost impossible for a system to maintain the relationships between frequency bands in the original musical signal.

Another minor matter: it is a very different proposition to generate bass from a single point source close to the floor and maybe also a wall, than to produce it from a pair of stand-mounted speakers. Twin or even multiple bass sources, wherever placed, do seem to give a more even low-frequency balance.

# Five Stars

**Paul Messenger explains why you should visit an independent**

Why use a specialist hi-fi dealer? The short answer is because he knows one hell of a lot more about hi-fi than you do. And if you've gone to the trouble of picking up a specialist magazine on the subject, you're obviously interested in something rather more than a mini system from the nearest electrical superstore.

You've probably bought this magazine for one of two reasons. You're looking for advice (presumably unbiased and good) on choosing and using your hi-fi system, and/or you're checking out the ads to decide where to go and buy it.

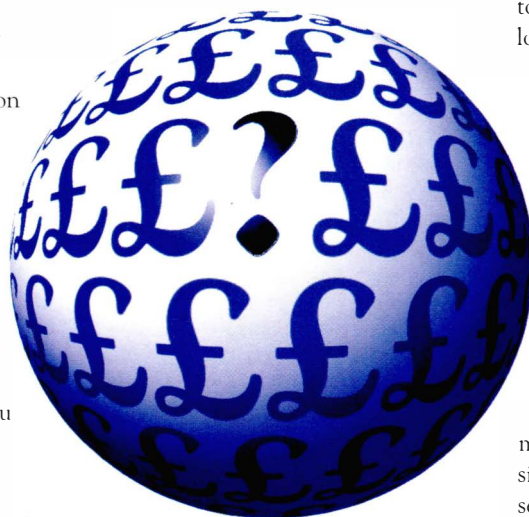
The independent specialist dealer doesn't know everything, and he doesn't know much about you, but if music's an important part of your life, he's the only guy around who's able (and hopefully willing) to help you choose the equipment which will give you the best long term satisfaction.

## **Power of the Press**

Dealers sometimes moan to me about the power of the press, and the disproportionate influence of its 'Best Buy' and multi-star ratings. Well, I've been in the press for twentysomething years, and still feel more ignorant than powerful.

The more I mess around with hi-fi gear, the more I become aware of our lack of real understanding of the subtleties involved, and the more I appreciate the importance of the dealer's skills and experience, in bringing together components so that the whole is greater than the sum of its parts.

We hacks get paid to write words, often about components in isolation, because



individual product reviews are still the staple diet of the press. They can sometimes provide a useful guide to the way a product performs, but only under the particular circumstances in which the review was conducted.

The hi-fi reviewer attempts, with varying degrees of success, to evaluate a particular component, and find something interesting (and hopefully positive) to say about it. That's about the end of it, and it's on to the next product.

The magazine prints the review, and that very process magically confers a measure of authority. Experienced hi-fi

enthusiasts, who read reviews over a period of years and try out various products themselves, soon start to realise the limitations of that approach. Some reviews are better than others, but none can get to grips with the real heart of the problem - whether a given product will improve your musical satisfaction, in your system and your room.

## **The Role of the Dealer**

The dealer's role is very different, and potentially much more valuable. He has the chance to talk one-on-one. If he's good at his job, he'll use that opportunity to find out what you as an individual are looking (or listening) for.

His motivation is very different too.

Sure he wants to make a sale. That's the lifeblood of any shop. But he also knows that if something he sells really does deliver long term satisfaction, there's a very good chance you'll come back again to see if he can repeat the trick some time in the future.

If you go into a shop and demand a particular CD player, on the basis that it got seven stars (out of five) in last month's magazines, the shop will probably simply take the line of least resistance and sell it to you. (Or switch-sell you to a similar price alternative, if he's fresh out of stock of that particular flavour-of-the-month.)

If you go in and say you're looking for a CD player, and want his advice on what to choose, things are liable to become more interesting. The onus is now on the dealer to show what he can do. His first task is to ask the right questions to try and get some idea of what you might be after.

Asking the questions is the easy bit. The real skill comes in using the information to come up with a shortlist of likely contenders, and then conducting a demonstration so that you have a real chance to play a central role in the

# For Value

specialist dealer if you are searching for real hi-fi satisfaction

decision making process.

Putting together a successful hi-fi system might not be as difficult as it was twenty or thirty years ago, but it's just as easy to make a mess of things. Put the 'wrong' combination of components together and it'll still sound a lot better



than any cute little mini system package. It might even rate a five star review. But it won't match the potential of a carefully balanced and properly installed system, and it certainly won't cater for your own particular preferences and personality.

We British are notoriously indiscriminating consumers, at a mass market level at least. The majority of the population don't even bother to drive a car they're thinking of buying, never mind take the trouble to listen to hi-fi equipment.

The majority will therefore end up with hyperstore mediocrity, and hi-fi that's about as tasty as supermarket bread. But if music is an essential ingredient in your daily diet, you owe it to yourself to become a member of the discriminating minority.

You know full well that your music collection is as individual as your wardrobe, and just as precious too, so it's worth taking the time and trouble to search out the dealer and equipment that will make that collection come alive, and give you a new buzz every time you play your favourite discs.

The independent specialist may not beat the chain store on price, but he continues to thrive in a hostile environment because real hi-fi is so much more than a matter of price. The people who work in these shops are themselves enthusiasts, often with many years of experience in meeting customer's needs, and the very necessary expertise to ensure that the whole thing is properly set up to deliver the best results.

The better the hi-fi, the more important it is to get the fine details right at the installation end of things, but even the least expensive equipment can be made to sound a whole lot better if good care is taken over the fine details - the support furniture, the cabling, the positioning of speakers and so on.

Without expert assistance even high class hi-fi can give mediocre results. With it you'll stand a very good chance of ending up with something rather more than a consumer durable - something which will be a source of considerable pleasure and genuine emotional satisfaction for decades to come.

I agreed to write this signed piece, irrespective of the specific sponsors, because I believe the independent specialist dealer plays a vital role in giving customers long term hi-fi satisfaction.  
"The views and opinions expressed here are my own and not necessarily those of hi-fi choice."

**Paul Messenger**

The specialist Dealers listed here are professional and enthusiastic. Give your nearest a ring for a demonstration.

## STAR QUALITIES

value for money  
service  
facilities  
verdict



## TOP 20 SPECIALIST HI-FI DEALERS IN THE UK

### LONDON

**N1**  
Grahams Hi-Fi  
190a New North Road  
0171 226 5500

### SW11

Oranges & Lemons  
61/63 Webbs Road  
Battersea  
0171 924 2040

### W4

Martin-Kleiser Ltd  
109 Chiswick High Road  
0181 400 5555

### SOUTH

**Ashford, Kent**  
Soundcraft Hi-Fi  
40 High Street  
01233 624441

### Chelmsford

Rayleigh Hi-Fi  
216 Moulsham Street  
01245 265245

### East Grinstead

Audio Designs  
26 High Street  
01342 314569

### Kingston-upon-Thames

Infidelity  
9 High Street  
Hampton Wick  
0181 943 3530

### Rayleigh, Essex

Rayleigh Hi-Fi  
44a High Street  
01268 779762

### Southend-on-Sea

Rayleigh Hi-Fi  
132/4 London Road  
01702 435255

### Uxbridge

Uxbridge Audio  
278 High Street  
01895 465444

### MIDLANDS

**Banbury**  
Overture  
3 Church Lane  
01295 272158

### Birmingham

Sound Academy  
152a High Street  
Bloxwich  
01922 493499

### Leicester

Cymbiosis  
(Formerly known as Listen Inn)  
6 Hotel Street  
0116 262 3754

### Northampton

Listen Inn  
32 Gold Street  
01604 37871

### Shrewsbury

Creative Audio  
9 Dogpole  
01743 241924

### NORTH

**Cheadle** (Stockport)  
Audio Counsel  
14 Stockport Road  
0161 428 7887

### Oldham

Audio Counsel  
12/14 Shaw Road  
0161 633 2602

### Sheffield

Moorgate Acoustics  
184 Fitzwilliam St  
0114 275 6048

### SCOTLAND

**Edinburgh**  
Russ Andrews Hi-Fi  
34 Northumberland Street  
0131 557 1672

### Glasgow

Stereo Stereo  
260 St. Vincent Street  
0141 248 4079

# Bookshelf beauties

David Vivian tests six small budget speakers, to separate the sweet and sexy from the stingy and sour!



Like New Zealand lamb, a good bookshelf speaker is versatile and can be very tasty. It's small enough to site in awkward places, and cheap enough not to gobble up too much of your precious system budget if you're a first timer. Fancy a better amp? A well-designed small speaker gives you the flexibility to buy one, because, unless you threaten it with a couple of power-station-sized Krells, it's unlikely to disgrace itself. Yet the very same speaker will improve a modest mini system beyond recognition. A decent budget box is, indeed, something of a marvel.

Little wonder that budget speakers form such a packed, competitive sector of the market. Punters like them, and hi-fi manufacturers like punters. There are well over 60 compact models to choose from at £180 or less. A great small speaker will provide years of emotional and cerebral satisfaction.

Behold six such speakers that aspire to be the best of the best. They're all two-way reflex designs, but what's surprising is the lack of manoeuvring room available to their makers, within the boundaries of this classic configuration and our narrow £119 to £180 price span.

The Rogers GS1 adheres to its maker's long tradition of producing conservatively styled but generously engineered boxes, which aim to provide a quintessentially 'British' sound. It takes over from the LS1 as Rogers' most affordable model but, at £179, it's the priciest contender in the group.

Looking like a slightly squatter LS3/5A (the legendary BBC mini monitor, also made under licence by Rogers, among others), it's a sturdy 4.5kg two-way reflex design, 30cm tall and equipped with gold-plated twin binding posts, to permit bi-wiring or bi-amping. It

## THE CAST LIST

Celestion 12i	£119.00	p71
Genexxa Pro LX5	£159.98	p72
Heybrook Prima 2	£159.00	p73
Mission 700	£129.90	p74
Rogers GS1	£179.00	p75
Tannoy Mercury M1	£119.99	p76

sets the tone for classy understatement.

As the only other speaker in the group that can accommodate twin runs of cable, Heybrook's entry-level Prima 2 closely shadows the Rogers' size and audiophile alignment. The new mk2 form is tweaked for speed, openness and 'musicality' — but not price, which stays at £159.

## HOW THE TESTS WERE DONE

All six pairs of speakers were auditioned with two systems, one budget, the other more ambitious. The budget system comprised a Denon DCD-825 CD player and Denon PMA-350SE integrated amplifier, with Straightwire interconnects and Kimber speaker cable — a starter system worth approximately £600 with speakers. The up-market ensemble came from Quad's 77 range: CD, preamp and power amp, all QuadBus connected and controlled with the wonderful 'intelligent' remote. This more powerful rig was able to stretch the performance envelopes and loudness capabilities of the contestants without imposing too much of its own character — which is essentially neutral and musical.

Speakerstands, Slate Audio's 24 inchers, were a little OTT, but at least we knew they were allowing the contenders to do their best work. Musical selections ranged from full-on Tom Jones and the *Full Monty* to the quiet, reflective beauty of Joni Mitchell and *The Hissing of Summer Lawns*. With plenty of jazz in between. Nice...

Just a pound more (for the pair, though you can buy them separately) is the intriguing Genexxa LX5 Pro, made by American electronics giant Radio Shack, known as Tandy over here. This diminutive and highly unusual design has been available for a few years through the Tandy network of shops, and is periodically discounted to £120. It's an American interpretation of a budget miniature, based on a 'high end for peanuts' conceit. This challenges the lovingly honed, fibreboard/dome tweeter conventions of its British rivals. The LX5 Pro uses a tough little metal box — outrageous at the price — and a Lineaem foil dipole tweeter.

Taking on the Brit specialists and the US up-start is 'the establishment', represented by Tannoy, Celestion and Mission. Defending the biggest reputation is the pretty Tannoy Mercury M1 (smaller sibling to the very successful M2 and M3 — both *HFC* Best Buys). Its cherry-veneered baffle contrasts handsomely with the black box behind it. Expensive-looking drivers are also part of the deal, and Tannoy seals this potent package with a knockout £120 price. Celestion's glowingly-endorsed 12i brings a slightly larger cabinet, inverted drivers — bass over treble — and a curvy plastic baffle to the party for £1 less than the Tannoys. It's a lot of box for the money.

Even bigger is the new £130 Mission 700, which kicks off the six-model 700 range. The original 700 was the first Mission to use the much-copied inverted-driver configuration. Its '98 namesake takes a leaf from its forbear's book, by stretching the size of a 'bookshelf' speaker up to 34cm tall and 26cm deep, which is the largest box volume here. If the Missions have a secret weapon, we suspect this may be it!

**CELESTION 12i**

No tricks, no fancy box, no freaky-tweaky stuff — this is your honest Joe, meat 'n' two veg budget loudspeaker. And experience has shown that this kind of design can work very well. Like the Mission, it has a slightly larger than average enclosure, which should benefit bass weight and extension. The quite large 19mm dome tweeter — ferrofluid cooled for improved power handling — augurs well for a smooth treble response, too. Bass/mid is handled by a 130mm long-throw driver, and both units are closely grouped with the front-firing reflex port, and mounted in a dense, one-piece composite baffle, which claims to minimise resonance. As for the cabinet itself, it was designed by a computer, in an effort to eliminate coloration.

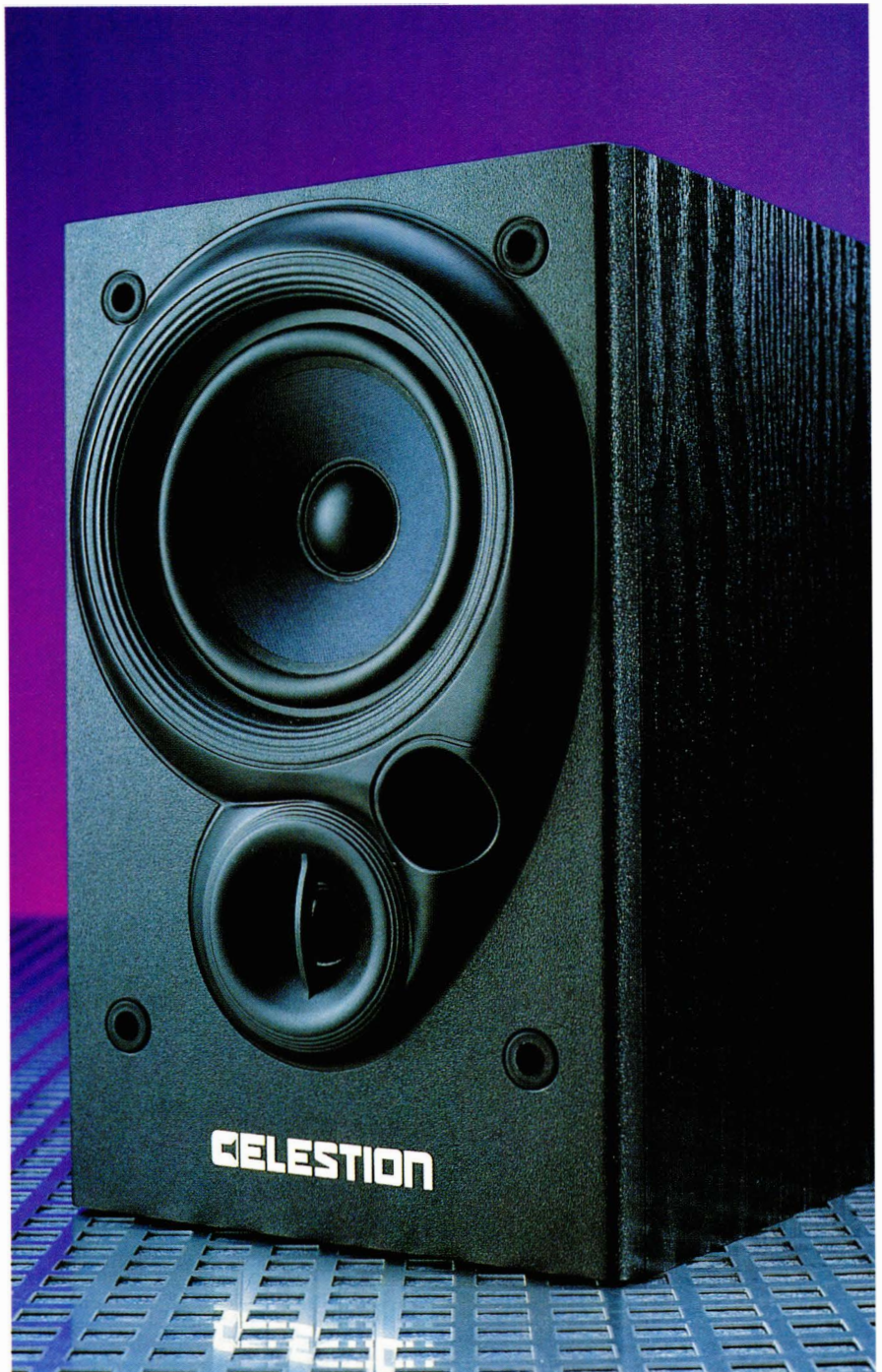
**Sound quality**

First the good news. *You Can Keep Your Hat On*, with Tom Jones in storming *Full Monty* form, was fun, fun, fun through the 12i. It conjured up the sweat and grimaces, the rasping brass section and the gravel in Tom's voice. Bouncy, full-on, great stuff. The more delicate tones of Patti Austin fared pretty well, too — good presence, nice inflection, live and intimate feel, with bags of ambient detail and atmosphere.

However, *Take Six* — a funky, silver-tongued close-harmony cut — wreaked havoc with the 12i. This is a hyper-clean, state-of-the-art recording. Fast and brilliant, with wonderfully taut, tuneful bass and great dynamics, it's a track that will never fail to flatter dull, overdamped speakers. The 12i is just the opposite and, basically, it got over-excited. It exaggerated everything and, with the volume advanced a couple of notches, lost the plot completely, becoming almost unlistenable, even with the restrained Quad 77 power amp at the reins.

But are we even having fun in the basic Tom Jones mould? Not really. The 12i's demeanour is a bit like a Jack Russell's — this isn't to say it's a dog, but it does try a little too hard to please. It's loud and insistent but, in the end, just too damn boisterous.

John Hammond was another casualty. *Fool's Paradise* is a very natural recording, with a great piano sound — all leading-edge bite and harmonic richness — but the 12i managed to change the character of JH's voice from dry to thin and edgy, while also imbuing the piano tone with an interesting but unnatural woodiness and warmth. Although the 12i has a strong and quite well-extended bass output, this is spoiled,



like much of the lower mid-range, by a mild thrummy presence, as if the box is joining in — which, almost certainly, it is.

Into the 77 CD player's disc tray went the excellent *Tales* by Marcus Miller, which showcases some deeply funky basswork from the man himself, not to mention some dazzlingly tasteful keyboard technique from the same fingers. With the 12i, Miller's keyboard work was treated more sympathetically than his '77 Fender Jazz bass, which sounded very full and weighty, but also strangely woolly and lethargic. Likewise, Miller's playing seemed decidedly lazy and perfunctory on his favourite instrument. The acoustic piano sounded more rhythmic, though the transient created by piano hammer hitting string lacked some bite. The abiding impression, absurdly, was that there were

two musicians not playing in time together, even though, in fact, it was the same musician captured on multi-track tape.

In general terms, the 12i hangs together reasonably well at low to moderate volumes. It can sound enjoyably crisp and articulate. It goes loud easily, too, with a claimed 88 dB/Watts efficiency — highest of the group.

**Conclusion**

When you pump up the Quad 77 to a decently attention-grabbing volume, some excessively obvious signs of strain set in: a slight hardening of the treble, a harsher and more aggressive mid-range, and a bass that starts to boom and lose its sense of tunefulness. What initially seems like involvement eventually collapses into irritation. None too inspiring.

**CELESTION VERDICT**

**SOUND** ★★☆☆☆  
**VALUE** ★★☆☆☆  
**PRICE** £119.00

**(FIVE YEAR GUARANTEE)**

⊠ Not without virtue, but the 12i's relentless enthusiasm and midband colorations can become wearing. Sounds loud, but feels the strain when you turn up the wick.

✉ Celestion Consumer Division, Eccleston Road, Tovil, Maidstone, Kent, ME15 6QP  
 ☎ (01622) 687442



### GENEXXA PRO LX5

Word on the street is that this miniature is a real giant-slayer, and a considerable bargain. To those in the know, it's one of hi-fi's best-kept secrets, so it might come as something of a shock to see it battling for the US of A in this small-box scrap. But we're glad it's here — at least now all the hype and mythology can be put to the test.

A word of caution, though: the LX5 is sold by the enclosure, not in matched pairs. This is useful if you're putting together a home cinema rig, but not ideal for perfect stereo. We have heard the odd report of individual enclosures having varying sensitivities, so that one sounds a little louder than the other. So if you feel tempted, make sure the people at Tandy are willing to break out the pair you want to buy, and hook them up to something decent in a quiet corner of the shop. Tandy assures us that all Pro LX5 from a particular batch are identical, and so each pair should be perfectly matched.

The Pro certainly catches your eye. Its dinky metal enclosure has rounded edges, a single set of meaty gold-plated terminals and

a rather austere matt-grey finish. It looks more sci-fi than hi-fi and is intriguingly cold to the touch. A 'high-compliance', four-inch-diameter carbon bass-mid driver takes care of business between about 90Hz and 2.4 kHz, while the Linaeum tweeter's proclaimed frequency ceiling is a remarkable 25 kHz.

The high-frequency unit, a curved, charcoal-coloured foil diaphragm, sits on top of the enclosure in a mesh cage. All very leading edge, but Tandy is far from bursting with people ready to disgorge specification details about this hi-tech spud of a speaker. Tandy's marketing department merely gives a polite collective shrug. The basics, as we understand them, are: nominal 50 Watts power handling, eight Ohms impedance and a mid 80s (perhaps higher) dB/Watts sensitivity.

Still, it would be misguided to get hung up over any of this. The Pro is about cheating budgetary constraints; being allowed to sip from the high-end chalice on a shoestring.

#### Sound quality

The moment you fire it up, you know the Pro is different. First you're hit by the amazing treble, then the peculiar bottom end. Bass from this box isn't just odd, it's *X-Files* strange. It has speed, it has welly but, at the same time, it sounds alarmingly colored and congested. It makes the lower midband sound slightly thick and compressed. Tonal differentiation is all but non-existent down there. Timing, though, is infectiously snappy.

So extraordinarily fast, clear and extended is the Linaeum tweeter, you know the moment you hear it that it's special. There

are some talented dome tweeters in this group, but none of them can hold a candle to what appears to be the superior technology embodied in the Genexxa. The sheer, stark honesty of the high frequencies is what marks out the Linaeum unit: the minutely resolved musical messages, the three dimensionality of the soundstage. Overall, the Pro doesn't project quite as holographic a picture as Acoustic Precision's FR1 (HFC 172), but the treble quality is of a far higher order, and the tweeter's influence on lower frequencies is as plain as it is beneficial.

Despite the bass anomalies, Tom Jones's *Full Monty* number really came to life through these speakers, sounding altogether lighter and crisper than through the Rogers and Mission, but also exceptionally clear and articulate with a super-realistic brass section. Patti Austin's voice had tremendous presence and her venue a more powerfully resolved ambience; there were individuals clapping rather than the more usual wash of applause in the background. But the energetic, crisply produced Take Six cut proved a stumbling block. Treble quality was again breathtaking, but at odds with the closed-in bass and limited dynamics. Push these toddlers too hard and they fall over.

#### Conclusion

The Linaeum tweeter's openness, grip and sheer resolving power make the LX5 Pro remarkable and worth considering — so long as you can live with the odd bass. Hawking a REL Q50 into your local Tandy store might cause a few raised eyebrows!

#### GENEXXA VERDICT

**SOUND** ★★☆☆☆  
**VALUE** ★★☆☆☆  
**PRICE** £159.98

(ONE YEAR GUARANTEE)

☐ The four-star sound rating is the average of a six for the treble and upper-mid, and a meagre two for the lower-mid and bass. A mixture of genius and grot.

✉ Intertan UK Ltd, Tandy Centre, Leamore Lane, Walsall, West Midlands WS2 7PS  
 ☎ (01922) 434000





### HEYBROOK PRIMA 2

The Prima 2 is one of those speakers which wouldn't warrant a second glance in the hi-fi shop. It's a modestly proportioned box, wearing a plain cloth grille. And that's it. The light cherry veneered test samples helped lift Prima's visual presence but, really, the best-looking bit is the Heybrook badge on the front.

Heybrook is synonymous with serious Brit-fi, the kind that offers technical excellence, material value and top sound. And it's the pursuit of better sound quality that has spurred the changes made by Heybrook to the Prima. The original 14mm polymer dome tweeter has been replaced with an updated version, with a modified front plate claiming to give more uniform frequency response and better off-axis dispersion characteristics. The previous model's metal-chassis bass driver has been upgraded to a more stylish and efficient unit, with a coated pulp cone and a rubber roll surround, fitted into a rigid-polymer vented chassis. The motor system has thicker voice coil wire and a larger magnet, which not only improves

the speaker's loudness capability, Heybrook says, but also gives better electrical damping in the bass. Naturally, the crossover has been upgraded to suit.

#### Sound quality

Do the changes make a difference? In a word, yes. The Prima 2 sounds open, articulate and accurate, with a sweet, natural treble and unswervingly musical presentation. It starts and stops more precisely than the other speakers yet, despite its leaner balance, is more communicative. There's an outstanding impression of cohesion and solidity, along with a freshness that makes even the best of the opposition here sound gilded.

What the Prima seems to have in glorious abundance is transparency — the magical quality that allows you to hear through a recording so clearly, that every last scrap of harmonic and timbral resolution, every nuance of technique, every ambient acoustic clue, is laid bare. Speakers that are talented in this direction sound wonderfully fresh, open and detailed, with excellent soundstaging, focus and incisiveness.

The key to the sound of the Heybrook, which is so unusual at this price point, is that it doesn't add much character of its own to the music. It's not only transparent, but also very open, revealing acoustic and timing clues on Eric Clapton's new CD, *Pilgrim*. It does all this while bringing a more tangible and harmonically rich feeling to John Hammond's slow-burning style of blues on *Fool's Paradise*. Like all open windows, it

permits a certain amount of rubbish to fly in, but the better the electronics, the better it gets, especially when bi-wired. It felt completely at home with the Quad 77 rig — it should be relatively future-proof.

The Prima 2's sharp focus and snappy timing were just as beguiling on guitarist Lee Ritenour's excellent *Alive In LA*. The Prima managed to sound incisive and relaxed at the same time. It's particularly good at keeping the sound free of artifice and cosmetic distractions — it's just you and the music.

This Heybrook speaker certainly doesn't sound musclebound. There was no shortfall of grit on Motorhead's *Snake Bite Love* thrash, just a lack of grunt, while big orchestral works failed to assume convincing scale and weight. However, the drama is preserved and performances remain beautifully coherent and well resolved, with their timing and interest intact.

The improvements to the Prima seem all-embracing. Here's a speaker with structure and rhythm in the bass, intelligibility in the mid-range, and smoothness and detail in the treble. It may be all you're looking for.

#### Conclusion

Although you can expect a weightier, more rounded sound from some of the other speakers in this group, you won't find anything with more delicacy, or a sound that more confidently portrays the dynamic ebb and flow of real music — nor one with sharper focus. The Prima 2 makes music with a sense of 'place', atmosphere and occasion. ▶▶

#### HEYBROOK VERDICT

**SOUND** ★★★★★  
**VALUE** ★★★★★☆  
**PRICE** £159.00

(TWO YEAR GUARANTEE)

Best of the bunch for openness, clarity, speed and timing. Lacks scale and weight with some material and the midband can seem a little cold, but still a sonic delight.

Heybrook Hi-Fi Ltd, Clemo Road, Liskeard, Cornwall PL14 3NH  
 (01579) 342866



### MISSION 700

The cheapest model in a manufacturer's line-up is often the most important: it delivers the company pitch to the greatest number of people. It may not be the best speaker in its maker's range, but it should espouse the core philosophy as powerfully as the flagship. This is true of all the speakers here, but you get the impression that Mission takes the whole business of delivering at grass roots level so seriously, it's kind of personal.

The 700 re-affirms Mission's intention to be Budget King. Until now, its best shots have been with tiddlers like the £140 731 Pro, but the 700 aims to be more mainstream and offer better value. Physically, the differences are immediately obvious. The 731 is quite dainty and shallow, while the 700 is much taller and deeper, but without looking cheap. On the contrary: prise off the contoured grille, and the Mission's fascia is very smart, dominated by an all-new bass/mid driver with a strikingly white, glass composite cone. The material is stiffer than polypropylene, yet, claims Mission, has

lower coloration than a paper cone. The mock leather-grain baffle finish looks good, too, as do the two front-firing ports flanking the area between the drive units. But the box itself is quite conventional, and isn't bolted to the rear baffle for extra rigidity à la 731.

#### Sound quality

The first thing to say about the 700's sound is that it has show-off tendencies. It's even-handed in the sense that it draws attention to all areas of the frequency range — it's a little bit top-py, a shade boomy and has a forcefully presented midrange — and yet it's musical, because it successfully captures the structure and timing of a performance.

Dull the 700 isn't, but neither is it OTT with leanings towards raggedness at high levels like the Celestion. The 700 is capable of luring you deep into your favourite track, can project an impressively deep, stable sound stage and image convincingly; tracks that previously sounded two dimensional fill out in a quite subtle and seductive way. Instruments and performers — Take Six, for example — sounded tangibly believable and always managed to play and sing together.

For some people, the best thing about the 700 will be that it has thumping bass, vigorous drive and impressive punch. It's a baby speaker, topped up with testosterone. Lower registers are agile and tuneful, and the 700 is no shrinking violet when it comes to slamming it out. It's a dance track natural, with plenty of welly in the basement. Yet it handles silky, whisper-quiet passages with

great deftness, too. Patti Austin's voice on her live-set CD — which can become unbearably edgy through speakers that poise and control — is delivered by the Missions with a rare combination of articulacy and warmth. The speaker captures the enthusiasm of the audience and the acoustic character of the venue very well, too.

The other 'warm balance' speaker here is the Rogers. It has a more fluid, lucid and measured delivery than the 700, but the Mission has a stronger and more forceful quality all of its own. It does slightly better in pure hi-fi terms as well, with greater separation between piano and orchestra, and generates more explicitly three-dimensional sound staging.

The Mission also successfully removes the sting from slightly harsh recordings like Tom Jones's *You Can Keep Your Hat On*, yet takes a real grip on the music and presents it in a tangible, coherent way, with excellent drive and rhythmic integrity. The 700's tonal balance — warm 'n' weighty — puts flesh on weedy productions but stops short of making lush recording obese. It has bags of poise, even at enthusiastic volumes, and its fluent, unruffled style makes all kinds of music enjoyable.

#### Conclusion

The 700 isn't perfect, neither is it quite as good as the Tannoy and the Heybrook. But it's certainly a cut above your average budget box, and offers a lot of enclosure, volume and musicality for your money.

#### MISSION VERDICT

**SOUND** ★★★★★  
**VALUE** ★★★★★  
**PRICE** ★★★★★

£129.90

(ONE YEAR GUARANTEE)

- ☐ Both in size and sound, a lot of speaker for the money. Good bass weight and extension, and goes loud with ease. Open to boom accusations, despite fine midband.
- ☒ Mission Electronics, Stonehill, Huntingdon, Cambs PE18 6ED
- ☎ (01480) 451777



## ROGERS GS1

With its flush black grille — a little fabric tab at the bottom yanks it clear of the surrounding woodwork — the GS1 is a paean to sober styling and restrained good taste. It has elegantly radiussed front corners, along with a cabinet build and finish that feels as good as it looks: expensive and long-lasting.

Confidence only grows when you look at the drive units. The pale, translucent polypropylene bass-mid driver, with its Kapton voice coil former, has real visual class, while the 19mm fabric dome tweeter looks sweet. Claimed sensitivity is no great shakes at 85dB/Watts, but the 80 Watts power handling is meaty enough to guarantee decent sound levels with a suitably muscular amp.

Rogers recommends using the GS1 on rigid stands, 150mm (six inches) from the rear wall, and angled so that the notional axes running down the centres of the drive units cross just in front of the listening position. But the GS1 also sounds fine firing straight down the room, if a little brighter in the treble, which is probably no bad thing. Experiment until you find the best result.

## Sound quality

Of all the speakers here, the GS1 has the most relaxed and relaxing presentation: easy going and then some. Timing is crisp but not quite as alert as that of the pace-setting snappy Heybrook, and the speaker has a tendency to sound overdamped and tonally a little dark in comparison, say, with the ebullient Tannoy. But there's a subtle authority to its music making that is appealing and accessible. You just know the Rogers isn't playing anything for gratuitous thrills or effect. It's attempting to be fair and neutral, and, for the most part, it succeeds.

Tom Jones's voice, on *You Can Keep Your Hat*, on the *Full Monty* soundtrack sounded convincingly powerful and gravelly as the band chugged towards that buttock-clenching finale. Patti Austin's extremely 'live' and intimate set (which always sounds sharp and sibilant on speakers with fierce tweeters) also benefited from the Rogers' fairly rich balance and slightly recessed mid range, adding bags of listenability to the mostly gentle ballad *It Might Be You* without slugging the tactile impact of its climax.

It doesn't take long to establish that the GS1 is most at home with classical music, but jazz, blues and mainstream rock fall easily within its reach, too. Its full bass and warm balance enhanced the bluesy feel of John Hammond's *Fool's Paradise* from the *Trouble No More* CD. However, there was a slight bloom to Hammond's voice which was not apparent with the Heybrook, Tannoy or Mission Speakers — all of which are marginally cleaner through the midband.

Despite this 'comfort factor' (probably because of it) Joni Mitchell's wonderful *Shades Of Scarlet Conquering from The Hissing Of Summer Lawns* was beautifully rendered, with a glowing, romantic analogue feel so gorgeous you could sink into it.

Lower registers are secure and grippy enough to do justice to techno tunes from Coldcut; the single *Timber* pumped along with just enough energy, and the synth washes sound spacious and warm. However, it's the mid-range that defines the GS1's overall character. It's expressive without being exaggerated, and the notably smooth tweeter handles complex rhythmic material with an ease that borders on disdain — some might say — indifference.

## Conclusion

The GS1 is a smoothie — it's no firestarter, but if push comes to shove, it can motor with Motorhead. In fact, its generous-natured bass helps beef up this band's curiously anaemic production values; if anything, it's just a little too self-effacing for its own good.

Top-to-bottom, the balance and integration are peachy but, on the Tom Jones track, the GS1 seemed to be holding back. Extreme treble seemed a little soft, too, but this didn't detract from a fairly lucid and musical delivery.

Although the GS1 will undoubtedly suit those who like their listening easy, it may not be for seekers after a thrill-packed ride. For best results, use with bright, dynamic electronics.

### ROGERS VERDICT

**SOUND** ★★★★★  
**VALUE** ★★★★★  
**PRICE** £179.00

(FIVE YEAR GUARANTEE)

Classy looking with equally classy, if slightly over-cautious sound. A great speaker for classical music, but laid-back balance ultimately smothers excitement.

Rogers International (UK) Ltd, Commonside East, Mitcham, Surrey CR4 1HX  
 (0181) 640 2172



### TANNOY MERCURY M1

Tannoy didn't so much shake up the budget end of the speaker market with the mid-sized £140 Mercury M2, as put several sticks of dynamite under its foundations. Overnight, the likes of KEF, Celestion, Mission, Mordaunt-Short and JPW had to face the fact that, for sheer sonic and material value, their baby bombshells had been blown away by this tubby newcomer. In fact, the M2 still comfortably qualifies for inclusion in this group, and would probably leave a scene of splintered wood and twisted metal.

But the truth is that it's too big for some tastes and not really suitable for bookshelf mounting. Cue for the competition to breathe a sigh of relief? 'Fraid not. Meet M2's little brother, the imaginatively named M1. Just 30cm tall, it'll fit just about anywhere, though, as with all these speakers, the best results occur when the M1's secured firmly to the top plate of a good-quality 24-inch stand, positioned close to a back wall.

If the straight-laced Rogers' appearance

seems a bit boring, the Tannoy's affecting mix of veneers succeeds in lightening the look of an essentially conservative box, especially with the grille removed to show off the good-looking 25mm soft-dome tweeter and treated-paper-coned 13cm bass driver. Claimed impedance of eight Ohms suggests an easy load, while alleged sensitivity of 87dB/Watts is high enough to give budget amps an undemanding time.

#### Sound quality

Straight away, it's easy to hear what the little Tannoy is getting right. The M1 connects immediately and vividly with the listener's pleasure centres. It handles busy or thickly-layered passages more clearly than the bigger-sounding Missions, if not quite with the vivacity and control of the Heybrooks.

There are three reasons why it works so well. First, in the areas of the M1's excellence — resolution, focus, presence and, most remarkable of all, an ability to portray music as a living, breathing 'event' — only the Heybrook Prima 2 is its equal. Second, it doesn't get much wrong. And third, if you want something that sounds sexy, expressive and deeply musical, on the cheap, it's almost stupidly good value for money.

The sparkle and animation of its music making is engaging yet it can also be deftly self-effacing and even-handed in the style of the Rogers. The difference is, the Rogers never really dusts itself off and boogies. Moreover, here's a speaker that doesn't favour one style

of music over another. It has enough balls and rhythmic drive to pump out dance and rock tracks with infectious energy, yet reserves a delicate touch and felicitous tonal sweetness for classical, jazz and AOR. Never do you get the impression that it isn't allowing tonal and dynamic contrasts-free reign.

Making comparisons with the Missions for the moment, the M1 doesn't have quite as much grunt, though it does have a fresher and livelier presentation, one in which the temporal aspects of the music are given equal billing with resolution and focus. This gives life and structure to discs even as dynamically squashed and turgid as Motorhead's *Snake Bite Love*. Better produced material, like Lee Ritenour's latest live outing on GRP, positively gleams and glows with confidence, LR's guitar phrasing sounding as tight and funky as you could wish for.

The Mission is weightier and may be a little smoother through the mid-range, too, but it can't quite match the M1's essential musicality, which, for £120, is nothing less than a revelation. Truth is, these babies have poise in spades: a lucid, undemonstrative, and wonderfully easy-breathing delivery.

#### Conclusion

Tannoy's ear for tonal color and texture is beautifully realised by the M1. Whereas the Celestion 12i can colour and untidy the music, the M1's output is seldom less than cleanly detailed and all-of-a-piece. The speaker sings and projects brilliantly.

#### TANNOY VERDICT

**SOUND** ★★★★★  
**VALUE** ★★★★★  
**PRICE** £119.99

(FIVE YEAR GUARANTEE)

☐ A remarkable product that sounds much bigger and more expensive than it is. Solid, tuneful bass, great drive, wide open soundstage and excellent imaging.

✉ Tannoy Ltd, Rosehall Ind Est, Coatbridge, Strathclyde ML5 4TF  
 ☎ (01236) 420199

# Conclusions



Tannoy Mercury M1

**B**aby boxes seem to be surfing an unprecedented surge in the gold standard right now. The levels of musicality, resolving power, imaging and sheer high fidelity on display here are almost frightening — which, of course, is great news. As we said at the start, the more value that can be built into this end of the system, the more money there is to spend getting things right further back in the chain.

One fairly obvious observation to start with: the Mission 700 has quite a kick. In the most brutal terms, all the other speakers were out-gunned by the bigger box from Huntingdon. It's louder, has beefier bass and delivers considerably more bangs for your buck. And yet, in the final reckoning, we can't help but feel slightly let down by Mission's new budget battler.

Here's a design that should have been propelled towards decisive ascendancy by the pressure of its peers, but it doesn't quite make it. To put it crudely, it's a sophisticated boom 'n' tizz box, albeit one with a very fine mid-range. When it's not in top gear, it can sound beguilingly effortless and smooth, but it never quite scales the sonic heights achieved by the Tannoy and Heybrook.

So what of the Genexxa Pro LX5? We have to admit, it's even more fascinating now that we've heard it, than when it was as an unproven buzz on the street. What it does well — basically, everything above 3kHz — it does so breathtakingly well that, had this contest been about treble quality alone,

there would have been little point in the others turning up. Just as well they did, though, because from the lower mid-range down, the LX5 is inescapably compromised. Timing isn't the problem: it's fast and punchy. No, it's the lack of bass and odd tonal character (of what bass there is) that poses the problem. Whether you can live with it, only you can decide. We couldn't, but we wouldn't give up on the Pro LX5 before trying it with a decent subwoofer. The Genexxa is trying to be something it's not, but at least it is trying. It gets tantalisingly close to being a small box sensation.

A far bigger let-down is Celestion's 12i. We were expecting something similar to the Mission: a big energetic sound that would kick some life into budget systems yet hold together sufficiently to show a subtler side with higher quality electronics. The 12i doesn't do too badly in the first rôle: it is a big-sounding speaker with plenty of drive and vivacity. But that's all it is: a resonant box, that likes to thrum along with the music, puts a firm lid on this speaker's sonic potential. It lacks finesse. Let's leave it at that.

Rogers' unassuming GS1 is a speaker that can soothe your soul: deftly balanced, unerringly tidy, slightly warm and, well, just occasionally a bit boring. It's the speaker we'd choose if we were forced to listen to music we didn't like, sure in the knowledge that it wouldn't make the tunes sound nasty. It's a design that can be praised for its smoothness and absence of fatiguing effects.



Heybrook Prima 2

If you're fed up with speakers that try too hard to impress, its beguiling presentation of detail might strike a chord, too. Actually, an awful lot of information is present in its output, but so well is it integrated and weighted, you're barely aware of it. The music is allowed to communicate, and that's always important.

Which brings us to the best. We really like the Heybrook Prima 2. It's a wonderfully fresh, fast and open little speaker that, like all good hi-fi products, makes you want to forget about equipment, and just play music. And, by a small margin, it's the most rewarding speaker here with which to tackle well-produced acoustic recordings. All it lacks is a little weight and body, as it simply doesn't have the slam of something bigger like the Mission. Even so, the Prima 2 delivers palpable advances in every direction over its predecessor, and with the right material, it's the most capable speaker here.

However, when all is done and dusted, the Tannoy M1 is the most engaging package at the most attractive price. It marries much of the appealing heft of the Mission with the clarity and quicksilver responses of the Heybrook, while adding a beautifully open and expressive midband of its own. It's obvious that a lot of effort and intelligence has gone into the M1. It left us tingling with good vibrations and aching for more. ▲



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NAD 314	freephone		
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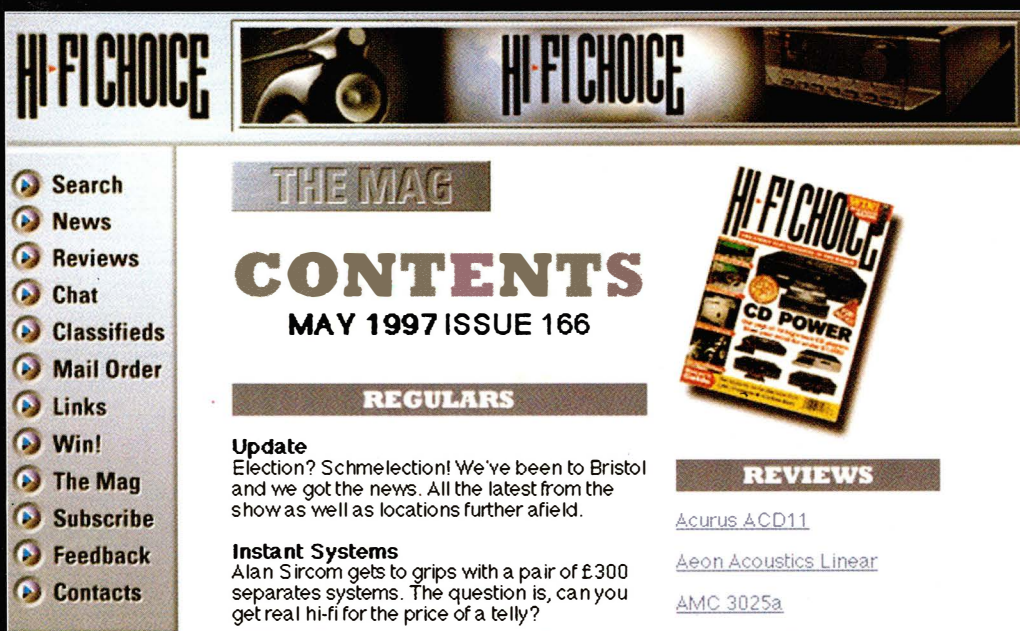
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**Instant Systems**  
Alan Sircom gets to grips with a pair of £300 separates systems. The question is, can you get real hi-fi for the price of a telly?

**REVIEWS**

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- [Aeon Acoustics Linear](#)
- [AMC 3025a](#)

\*Answers at the bottom of the page for those without web access.

### Have you ever wondered...

- 1 Which is the most expensive amplifier in the World?
- 2 How many drive units in the Mission 753 Freedom?
- 3 What is the name of Benz-Micro's most expensive cartridge?
- 4 What is the best CD player for £350 or under?

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1 The Audio Note Cxku (On) at a basic price of £1159,500, is probably the most expensive commercially manufactured amplifier package in the world. And it's only a power amp. 2 Five drive units in total: four 1.30mm plasticized-paper long throw mid-bass units and a 27mm silk-dome tweeter. 3 Benz Micro's most expensive cartridge is the Ruby Open Air moving-coil, priced at £1,600 and available from Audioreaks in the UK. 4 One of the best value CD players priced below £350 is the Cambridge Audio CDASE, which received an HFC Best Buy in issue 163. We'll assess the latest crop budget CDs in our December 1997 issue.

# STARTERS ORDERS

What's the price of entry to hi-fi CD spinning? **Alvin Gold** (listening test) and **Paul Miller** (lab test) check out eight inexpensive models to answer an oft-asked question.

**T**his month we're checking out the inexpensive end of the CD player market. Our cheapest candidate costs a mere £140, while the dearest clocks in at £350. All players are from major manufacturers, and you should have no trouble finding any of them in local High Street shops. In some cases, they'll even be on sale in big-name multiples and department stores.

Do different CD players really exhibit strongly characteristic sound? In our experience the answer is 'yes' — and the differences are much more musically significant than a few tonal aberrations. However, there is a widespread feeling that only high-end CD players really sound significantly different. Certainly, many high-end models sound demonstrably better in very obvious ways, and many lower-cost offerings yield stereotypically grim results.

Nevertheless, we were pleasantly surprised to find inexpensive models in this month's test which punched above their weight and served to refute our preconceptions about CD player price and performance. Naturally, those with bigger budgets will find their greater investment rewarded by more exalted sonic pleasures; but there is a special thrill to be had from finding a component that sounds great and goes for a song in the local hi-fi emporium.

As we write this, we're still trying to figure out what to make of the new Digital Versatile Disk (DVD) format. (See p33 of *HFC* 175 for a swift primer on the subject; and for more detailed ongoing coverage, read *HFC's* sister publication, *Home Entertainment*, every month. —Ed) In its video-replay guise, DVD is now officially on

sale in the UK, with a growing range of both players and movie software becoming available. However, whatever its merits as an upmarket video player, DVD has attracted attention in recent months from hi-fi sages, and they are beginning to propose DVD video players as rivals for some of the best CD-only machines. (See *Ear Waxings*, *HFC* 178, for more on this. —Ed)

This author's view is to treat these early reports with caution, not least because DVD technology itself is still wet behind the ears. In any case, the starting price for DVD is well above the price range for this month's group,

so as far as budget CD players go, orthodox technology is still king. *AG*

## THE CAST LIST

MODEL.....	PRICE . .	PAGE
AMC CD9/DAC8.....	£199.99 . .	p82
Arcam Alpha 7 (improved)...	£330.00 . .	p86
Denon DCD-1550AR .....	£349.99 . .	p87
Kenwood DP-5090 .....	£299.95 . .	p89
Marantz CD-67 mkII .....	£249.90 . .	p91
NAD 522 .....	£169.95 . .	p83
Sony CDP-XE310 .....	£140.00 . .	p84
Technics SL-PS670D .....	£200.00 . .	p85

## HOW THE TESTS WERE DONE

**O**ur eight candidates were subject to the usual battery of tests: i) a close physical examination; ii) auditioning in a high-grade hi-fi system by a panel of 'unsighted' listeners; iii) hands-on listening by the author, using a range of speakers and source components; iv) a computerised measurement test programme. Each player was run in and warmed up prior to auditioning. *Hi-Fi Choice's* formal tests are by far the most challenging of any hi-fi publication.

We concluded the panel tests in a single day, but still found time to present some players more than once, though of course no panellist knew which product was being played at any time. Volume levels were equalised between test runs using white noise and a sound pressure level meter.

The system used for these tests included a **Krell KAV-300cd** CD player (an upmarket reference), **Copland CTA-301/CSA-515** pre/power amps and **Definitive Technology BP6** floorstanding speakers. Speaker and interconnect cables included **SPM** from **Nordost**. The hands-on listening was broadened to include a number of other loudspeakers, including **TDL CF300 'Cheviot'**, **Tannoy Precision P30** and **Rogers LS5/9**. Other source components for reference included a **Meridian 508** CD player, while a **Sony TA-F3000ES** amplifier (Best Buy, *HFC* 178) served as a means to assess how each CD player would interact with a 'normal'-priced amp.

## WHAT MUSIC DID WE USE?

Buena Vista Social Club (with Ry Cooder): *Chan Chan* from *Buena Vista Social Club* — World Circuit WCD 050  
 Joni Mitchell: *Cool Water* from *Chalk Mark In A Rain Storm* —  
 Geffen 924 172-2

Handel: *Allegro from Suite No 2 in F Major*, HWV 427; Murray Perahia (piano) — Sony SK 62785

Mendelssohn: *Melodram* (aka *Wedding March*) from *Ein Sommernachtstraum*; Gewandhausorchester Leipzig —  
 Teldec 2292-46323-2

Various other albums and pieces were used for hands-on testing.

## THE LISTENING PANEL

Our customary thanks to those who contributed their listening skills and time: Robin Marshall (Mission), Keith Haddock (REL), Steve Cross (Ruark), Russell Kauffman (Densen) and Julian Maddock (Mission).





A NAD 522 p83



A AMC CD9/DAC8 p82



A Sony CDP-XE310 p84



B Denon DCD-1550AR p87



A Technics SL-PS670D p85



B Arcam Alpha 7 p86



B Kenwood DP-5090 p89



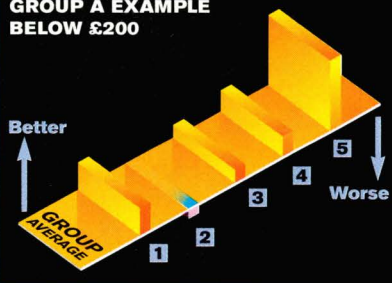
B Marantz CD-67mkII p91

UNDERSTANDING OUR BAR-GRAPHS AND GROUP AVERAGES

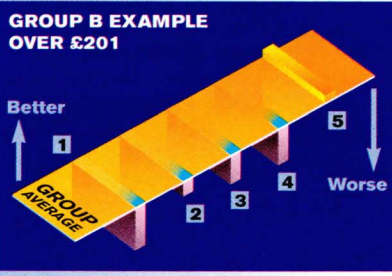
There will be significant differences between the cheapest product in our test and the most expensive. For this reason we always segregate our test candidates into two or more categories based on price. Our aim is to assess every product's performance in the context of its closest rivals.

Each lab-report panel is colour-coded according to the key given below:

GROUP A EXAMPLE BELOW £200



GROUP B EXAMPLE OVER £201



UNDERSTANDING OUR BAR-GRAPH MEASUREMENTS

The measurements behind *Hi-Fi Choice's* unique bar-graphs are provided by our Technical Editor, Paul Miller, using both GPIB-controlled measurement hardware and his own, award-winning, PC-based Virtual Instrument software. Each bar-graph value is derived from a weighted statistic of several key measurements and is displayed relative to a notional zero per cent which represents the group average for that particular category.

**1 Suppression of Digital Images:** This indicates the effectiveness of the player's digital filter in removing 'aliasing' or 'stopband' distortions immediately outside of the audio band.

**2 Jitter:** Any uncertainty in the timing of the digital code produces digital jitter which manifests as an insidious form of distortion during digital-to-analogue conversion. The lower the figure the better.

**3 Practical Dynamic Range:** This is determined by the player's Signal-to-Noise ratio and to what degree it is compromised by any Noise Modulation occurring under real signal conditions.

**4 Harmonic Distortion vs. Level:** This bar chart value is derived from the variation in distortion both with frequency and signal level. The consistency and nature of the distortion also forms part of the equation.

**5 Linearity:** Linearity is a measure of the player's low-level resolution. For example, if a signal coded at -80dB emerges from the player at -80.5dB then this represents a deviation in its linearity of 0.5dB.

TEST INNOVATOR OF THE YEAR

Our Technical Editor, Paul Miller, has been awarded Test Innovator of the Year by *Test* magazine, the leading European journal of the test and measurement industry. This gong came in recognition of Paul's Jitter Measurement Suite, as used to test CD players for *Hi-Fi Choice*.

**test**  
The European Test Industry Journal



# AMC CD9/DAC8



**A**bsolutely outrageous! That's the only reasonable way to describe a two-box CD player that sells for a mere £199.99. This price itself represents a full £50 saving on the cost of the two components purchased separately — £119.95 for the CD9, and £129.95 for the DAC8. How low can you go?

This is not a transport paired with a DAC; rather, the latter complements an integrated CD player. While the latter has outputs only for an electrical S/PDIF digital signal and two channels of analogue audio, the DAC8 DAC has four digital inputs selectable from the front panel. Three of these are electrical, one is optical (Toslink).

Each input automatically locks onto a source sampling rate of 32kHz, 44.1kHz or 48kHz, meaning the DAC is compatible with virtually any digital source, including DAT and MiniDisc. Usefully, the DAC itself also offers an electrical digital output, to permit use with a digital recorder.

The CD9 player is almost identical to the more expensive CD8a (£150) tested in *HFC* 172, but omits the balanced audio outputs — in practice, not a great sacrifice. The remote-control handset features a random-access keypad, A-B section repeat, and a time-display switch. These supplement the

basic track skip, search, random play and programming keys sited on the player's front panel.

Neither player nor DAC is equipped with a headphone socket, and the player's display is a simple time-and-track readout. While the CD8 is said to be equipped with a MASH D/A converter, the DAC8 is fitted with a continuous calibration variant.

### Sound quality

There is a clear sonic improvement when the DAC8 is engaged — it adds light and shade to the music. You'll hear more expressive and complex dynamics, and some sweeter high frequencies — particularly noticeable with piano music during our tests. The CD9 alone generates a less expansive image, and prevents music from breathing in an open, relaxed fashion. It demonstrates some rather crude mid and upper-frequency colourations which are ameliorated by the DAC8.

The listening panel heard it only in two-box guise, and gave it one of the highest scores in the test. From the listener who marked it down most strongly, we had this complaint: "thin sound, lacking in bass" and that "it can't time to save its life". Both of these points were explicitly contradicted by

two other

panellists, but our critic did praise what he heard as "the first CD player (so far) not to spit at the top", also commending its "clean, detailed midrange". After the Buena Vista Social Club recording, one participant described the AMC combo as "tight and rhythmic", and that the Handel had a "nice, flowing kind of sound".

The second of these comments comes closest to my own views from the hands-on listening. AMC's two-box player may occasionally lack electricity, but it has an open, organic sound that certainly steers well clear of the desiccated, mechanical presentation offered by all too many CD players.

### Conclusion

Though it is no sophisticate, AMC's CD9/DAC8 combination is an honestly specified, well-presented CD solution, evidently constructed from decent materials, and equipped with smooth-acting controls. Though its music-making sometimes lacks fire, it sounds organic and attractive, with decent timing and respectable imagery. You'll be hard pressed to do better at this price. *AG*

### VERDICT

**SOUND** ★★★★★☆  
**VALUE** ★★★★★★  
**PRICE** £199.99

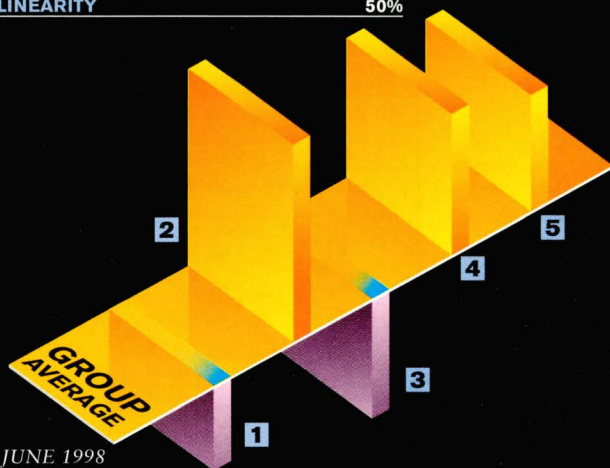
(ONE YEAR GUARANTEE)

CD player plus simple outboard DAC is a well presented middle-of-the-road performer — at an unbeatable price.

Tangent Acoustics UK, 115 New London Road, Chelmsford, Essex CM2 0QT  
 (0500) 828620

### HOW IT COMPARES

1	SUPPRESSION OF DIGITAL IMAGES	-35%
2	JITTER	85%
3	PRACTICAL DYNAMIC RANGE	-50%
4	HARMONIC DISTORTION VS LEVEL	60%
5	LINEARITY	50%



### THE LAB REPORT

The CD9 player may be equipped with a MASH/PWM bitstream converter, but the partnering DAC8 uses one of Philips' TDA1305 hybrid Bitstream/Continuous Calibration DACs so don't expect this 'two-boxer' to sound anything like the 'one-boxer'! The digital interface is handled by another Philips' chip, the TDA1315, which may contribute to the moderately high 702psec jitter. Nevertheless, this figure does not include the clump of uncorrelated (i.e. noise-like) jitter that may well influence the player's resolution of sharp, stereo images, for example.

Distortion follows an interesting trend where a strong 0.04 per cent 2nd harmonic at HF gives way to a very low 0.009 per cent distortion through the musically-important -30dB range. Distortion remains low at lower signal levels where the DAC also enjoys good resolution, suffering minimal errors of +0.3dB/-0.6dB over a full 100dB dynamic range. In practice, the latter is mildly compromised by a substantial +13dB of noise modulation, caused by the multi-bit portion of the hybrid DAC technology (also used by Mission and Roksan, by the way). Do also watch the low-ish 1.9V peak output if you're involved in an A/B demo, otherwise the CD9/DAC8 could sound unfairly undynamic. *PMI*

# NAD 522

For many years, NAD has promulgated a no-nonsense, back-to-basics image, in which superior sound-quality compensates for a product's lack of frills compared to rival products at the same price.

True to form, the 522 is dressed in regulation NAD grey. Its simple but attractive LED display shows track number and timing readouts, alongside a calendar track-summary display. The rudimentary control set includes random-play, cueing and track-skip functions, while an additional button toggles the display between elapsed time of individual tracks and the time remaining on the disc itself.

Now for what you don't get. You don't get a headphone socket, nor is there a digital output so neither can it make digital dubs onto a MiniDisc player or CD recorder, nor can it be upgraded with an external DAC. However, there is a remote control handset, which includes a random-access numeric keypad.

Internal technology is said to follow the pattern established by earlier NAD models: a MASH converter, five-pole anti-aliasing fil-

ter, and independent regulated power supplies for digital and analogue circuits. NAD claims further to have used superior-quality analogue components like metal-film resistors and polypropylene capacitors.

## Sound quality

This player has just received a glowing write-up in another consumer magazine. However, our listening panel is obviously harder to please, since they awarded this player the lowest score in the test. Furthermore, the panel's comments, both positive and negative, on two separate, unsighted presentations, showed remarkable uniformity in tone.

The super-smooth Joni Mitchell was described by one listener as a "thin, splashy, brittle and a crude representation," and as "strident and splashy" by a second panellist. This pattern was repeated in many comments on other musical extracts. One participant summed up by describing the 522 as having an "acceptable balance, but with a brittle top end, a mechanical quality overall that detracts from the enjoyment of listening

to music".

Unfortunately, hands-on listening provided no redress. The treble is definitely brittle, giving a hard and, yes, mechanical edge to the sound of familiar instruments and voices. Stereo imagery was notably lacking in depth. Most of all, there is a fundamentally inarticulate quality to this player, which was really only overcome with the simplest and silkiest of recordings — James Taylor's *Line 'Em Up*, for example. However, this track is calculated to show the best side of practically any player.

## Conclusion

If the sound of this player failed to get the pulses racing, neither did it prove a treat to operate. The mechanism is wheezy, and track access is slow. Worse still, the 522 skipped occasionally even on clean discs that played fine in other machines. Regrettably, this player has little other than a low price to elevate it above the crowd. AG

## VERDICT

**SOUND** ★★☆☆☆  
**VALUE** ★★☆☆☆  
**PRICE** £169.95

### (ONE YEAR GUARANTEE)

The lack of features would be excusable if sound-quality was above-par. Sadly, it isn't.  
 The Audio Club, Unit 15, Faraday Road Industrial Estate, Aylesbury, Bucks. HP19 3RY  
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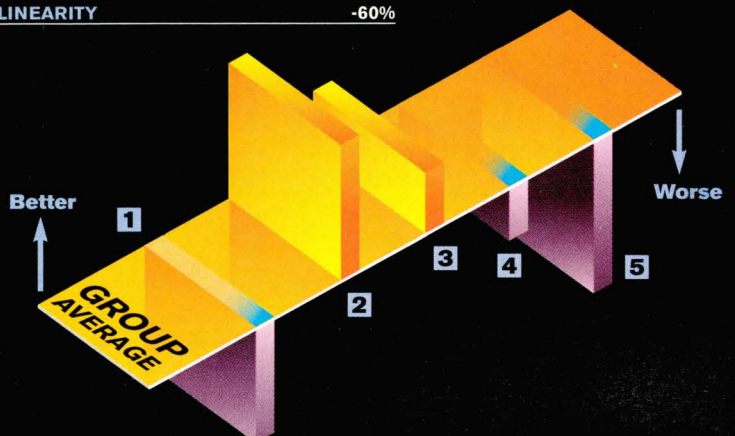
## THE LAB REPORT

In something of a departure for NAD, which has previously adopted Technics' MASH/PWM technology, the 522 appears to use the same Burr-Brown PCM1710 hybrid converter also found in recent Arcam and Rega CD players. But there's a twist. In this case, NAD has adapted the five-pole analogue filter used in its earlier machines to reduce this DAC's excessive output of ultrasonic requantisation noise. This will certainly make the 522 less 'amplifier-fussy' than its technical companions but it's still no less susceptible to the 'wandering idle tone' (see Arcam Alpha 7). Depending on signal conditions, this tone persists some +20dB above the local noise floor, reducing the final A-wtd S/N ratio from 104dB to around 98dB in practice.

Distortion is a bit higher than the Arcam Alpha 7 at typically 0.003 per cent midband but increases further to 0.03 per cent through bass and treble. Then again, the 522 does represent a cost saving on the Alpha 7. I must also point out that high jitter levels from the other players in this survey make the 522 look artificially good. In reality, the 1106psec jitter is composed of bold, even-order data-induced sidebands that are highly unusual but, because of their nature, especially ruinous to sound quality. PMI

## HOW IT COMPARES

1	SUPPRESSION OF DIGITAL IMAGES	-45%
2	JITTER	55%
3	PRACTICAL DYNAMIC RANGE	25%
4	HARMONIC DISTORTION vs LEVEL	-20%
5	LINEARITY	-60%



# Sony CDP-XE310

The CDP-XE310 leaves good first impressions. Despite being a simple, budget-conscious player — at an impressive price for a Sony — its slimline proportions are enhanced by sleekly-bevelled edges. Ease of use ranks highly. Track-to-track skip is not the fastest, but the disc-loading drawer acts more smoothly than usual. The rotary track selector, a Sony innovation now being imitated left, right and centre, is a particularly simple but useful inclusion.

The player supports all the usual playback and programming modes. It can show the length of a programmed selection, and perform a fade start or finish as well. This is a basic suite of functions for the home taper, though some cassette jocks might long for a peak search function. Still, at £140, who's complaining?

Though it doesn't have a fully variable analogue audio output, this Sony is among a substantial minority of players with a 20dB mute facility. As usual though, our advice is to keep the output at maximum, and adjust volume levels within your system's amplifier.

There is no headphone socket, which is



usually a standard fitment for a Sony, but understandable at the price. Rear-panel fixtures are limited to analogue and optical digital outputs, but this leaves the way open for digital dubs onto CD-R and MiniDisc. The remote control is a chunky stick type — an ergonomically sound design.

### Sound quality

With a low score from the panel, our listeners agreed on what they heard, but were less than unanimous when interpreting their observations. The Sony's extra vitality and weight were immediately apparent by comparison with the NAD 522, for example. "It sounds like the last player with a subwoofer attached," said our listener. Paradoxically, however, the Sony was felt to be deficient in the very lowest half-octave.

Its treble performance attracted the greatest attention. On the whole it was felt to be detailed, but as one listener ventured after the Joni Mitchell track: "there's too much energy in the treble... hi-hats are too prominent and the voice is glassy and sibilant". The Mendelssohn orchestral piece was described as "dry and harsh". Others, however, felt that this player was clear and

open, if "a bit furry" (Ry Cooder).

The CDP-XE310 is not a great player by any standards, but given the price, it is a surprisingly capable unit. Hands-on listening showed that it is every bit as detailed and transparent as the panel claimed, although the midband is rather flat and mechanical when reproducing powerful, percussive instruments like a Steinway piano. The bass seemed fair, but arguably it was swimming a little out of its depth with large, wide bandwidth speakers, or smaller speakers with good subwoofers.

### Conclusion

This player has shortcomings, but its ambitious, high-octave delivery is much more musically compelling than usual for such a low-cost player. To give it an unambiguous Best Buy verdict would clearly be inappropriate, but it is certainly Recommended, with some reservations if you have an already bright or thin-sounding system. *AG*

**VERDICT**

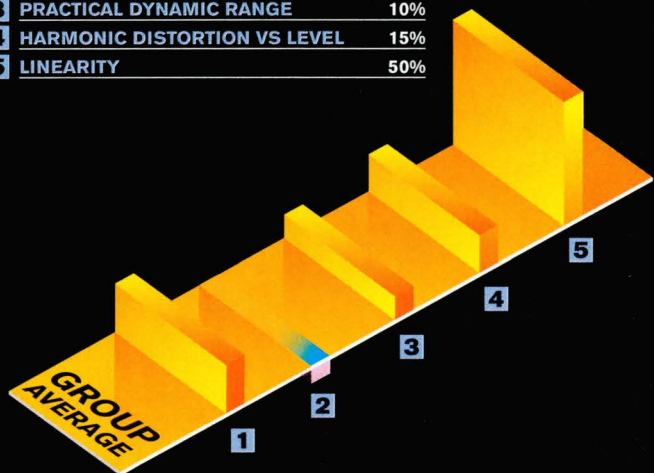
**SOUND** ★★☆☆☆  
**VALUE** ★★★★★  
**PRICE** £139.99  
**(ONE YEAR GUARANTEE)**

☐ Thin, sometimes jangly player, but offers plenty of detail, too. A spicy-sounding and well equipped bargain.

✉ Sony UK Ltd., The Heights, Brooklands, Weybridge, Surrey KT13 0XW  
 (0990) 111999

## HOW IT COMPARES

1	SUPPRESSION OF DIGITAL IMAGES	20%
2	JITTER	-5%
3	PRACTICAL DYNAMIC RANGE	10%
4	HARMONIC DISTORTION VS LEVEL	15%
5	LINEARITY	50%



## THE LAB REPORT

The ingredients of Sony's CDP-XE310 are very simple: take one CDP-XE300 (recommended in *HFC* 163), add an optical digital output and stir-in a few well-chosen decoupling capacitors. Thus, the performance of the CDP-XE310 very closely mirrors that of the '300 with excellent low-level linearity (errors of just +0.3/-0.5dB over 100dB) and low midband distortion (0.001 per cent at 0dB and 0.01 per cent at -30dB). The peak output voltage is almost right on the nail at 2.08V, but its source impedance remains high at 1.1kOhms. This suggests the player will not appreciate amplifiers with low input loads (Arcam Alphas, for example) and it will not appreciate long or weird interconnect cables.

The player's master oscillator has a mere +8ppm error but, just like the '300, the '310 still incurs a substantial 1980psec of predominantly power-supply-induced jitter. Subjectively, this is not as damaging as, say, 1000psec of data-induced jitter but it does impact on the player's resolution of bass detail in addition to compromising the 'solidity' and focus of its stereo images. The base-band noise of the player is also unusually 'gritty' in appearance — a phenomenon noted with the CDP-XE300 but whose effect is uncertain. Otherwise, the player looks as slick as the average, giant-killing Sony. *PMI*

# Technics SL-PS670D

A few months ago (HFC 172) we tested the Technics SL-PS770D, which is a well-equipped player with some interesting hardware under the hood. A pretty worthy design, we thought, but its music-making seemed a little forced. The subject of this month's report is the SL-PS670D, which looks and behaves pretty much like the 770, and shares many of the same internal features. However, thanks to the omission of a few technological details, the '670 is some £50 cheaper.

What's gone? Well, apparently the 'S-Advanced' MASH one-bit DAC is now a 'High Grade' MASH one-bit DAC, which is said no longer to operate in Class A. There's no 'Virtual Battery Operation', Technics's proprietary power-supply technology designed to emulate the low-noise characteristics of battery-based power supply.

However, this player still contains Technics' Také capacitors with bamboo-pulp separators, and 'Organic Semiconductive' capacitors, said to reduce noise and impedance. And like the '770, it is built upon the 'Technics Hybrid Construction Base', which claims to be a low-resonance, low-microphony platform. A busy-looking Technics fascia features a centrally-mounted,



quick-acting loading drawer, mounted above an attractive display which includes a thermometer-style track-number display, and a dot-matrix track-number/time readout.

The SL-PS670D is awash with features aimed at home-taping enthusiasts. These include auto-cue, which invokes pause at the start of a track; and time fade, which fades out a track at a pre-specified time then switches into pause, permitting the user to take out a tape and turn it over ready to record the next side. CD Edit, meanwhile, allows the user to dial in the length of a tape — C60, C90 etc — so that the player can work out the order in which to play tracks, so that they are most efficiently packed onto the tape of choice. Most operations may be performed on the unit or via remote control. There is a variable-level audio output.

posed, if a little less exuberant than ideal". Another talked of its cohesive quality and strong impression of musical solidity.

Hands-on testing yielded a broadly satisfactory outcome — the player performed well all round. It is an attractive, open design, and while it cannot transcend its cost-restricted character, neither is this painfully obvious. It gave a well-disciplined account of many music titles. However, it was perceptibly less than distinguished with well-recorded piano pieces, which sounded rather flat, and the same was true for its portrayal of other instruments rich in high-frequency harmonic detail, notably violins and woodwind, which lost some of their individuality and sparkle.

## Conclusion

For £200, this player offers a very fair deal. It is neither the fastest, most detailed nor most three-dimensional player around, but it treats the middle ground with confidence, and is transparent enough to let most recordings speak for themselves. A quiet drawer mechanism and very rapid track access reinforce confidence. AG

## VERDICT

**SOUND** ★★☆☆☆  
**VALUE** ★★★★★  
**PRICE** £199.95

(ONE YEAR GUARANTEE)

- Fine middle-ranking player: well built, with disciplined sound. Sometimes seems to lack a touch of detail and a shot of adrenaline.
- ✉ Panasonic UK Ltd, Panasonic House, Willoughby Road, Bracknell, Berks RG12 8FP (0990) 357357

## Sound quality

In two separate presentations, the SL-PS670D scored above average — good result for a £200 player, even if it could not match the popularity of its more expensive sibling. One listener thought the Joni Mitchell track sounded "coloured", while another said that it was "slightly sat upon". One sum-up comment, which is fairly typical, was that this player sounded "very com-

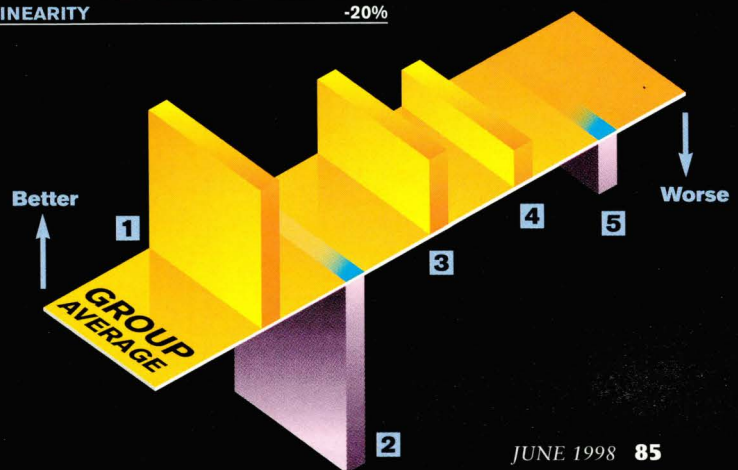
## THE LAB REPORT

In much the same fashion as Technics' SL-PS770D, the SL-PS670D is distinguished from its 'A' predecessor by the inclusion of so-called Také (bamboo-shoot) and OS capacitors. More importantly, perhaps, the analogue op-amp has also been revised over that used in the SL-PS670A, shifting the balance of THD with a slight decrease to 0.001 per cent through the midband but a slight increase to 0.03 per cent at HF (all at 0dB). Otherwise, the SL-PS670D is as the SL-PS670A; its MN6474 MASH/PWM DAC shows +0.2dB/-2.3dB errors in linearity over a 100dB range, S/N clocks-in at 102.4dB and the output impedance remains high at 820 Ohms. Some sensitivity to interconnects and low-input impedance amps may be experienced.

Nevertheless, the most destructive force, already well documented with players like the SL-PS670A, SL-PS770A and SL-PS770D, still remains to haunt the SL-PS670D: a vast 3632psec jitter of which a full 3534psec is accounted for by data-induced sidebands. I fear Technics is missing the point by tinkering about the edges with fancy capacitors when the Achilles' Heel of the product is more fundamental. Only when Technics addresses this issue will the quality of its budget machines start to improve. *PMI*

## HOW IT COMPARES

1	SUPPRESSION OF DIGITAL IMAGES	55%
2	JITTER	-75%
3	PRACTICAL DYNAMIC RANGE	30%
4	HARMONIC DISTORTION vs LEVEL	15%
5	LINEARITY	-20%

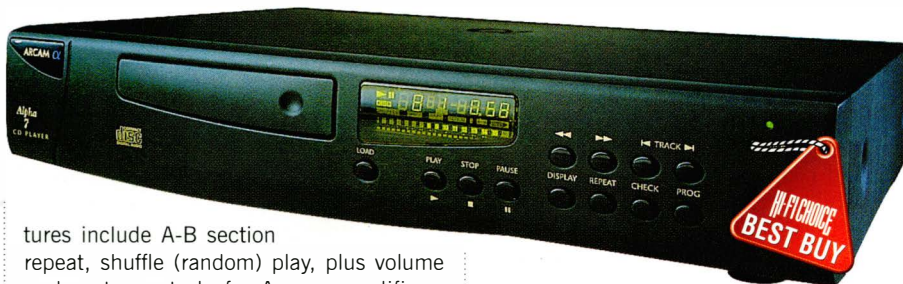


# Arcam Alpha 7 (improved)

We reviewed the original Alpha 7 in *HFC* 163, whereupon it was Recommended, but now it has been 'tweaked', so it's under scrutiny again. Arcam has made no official announcement, so the 'improved' suffix is ours alone.

The enhancements are the kind that many long-running models undergo in mid life, especially when manufacturers find new ways of measuring an original's shortcomings. Arcam claims to have made revisions to the main printed circuit board (PCB) and the power supply; to have made component changes in the digital-to-analogue convertor (DAC) and audio output stages; and to have improved mechanical isolation of a number of "key" components, apparently to reduce microphony (mechanical vibrations modulating the sound).

The Alpha 7 looks busy, even fussy, and not quite finished to the high standards of the best Japanese kit. However, its soft styling lines are a relief from the conventional four-square box. The display is too bright in normal operation, but may be dimmed or turned off. The remote-control handset includes a space key, which adds four seconds between tracks — this may be of benefit to home recordists. Other user fea-



tures include A-B section repeat, shuffle (random) play, plus volume and mute controls for Arcam amplifiers. Curiously, the player responds to NEC/Sony and Philips remote-control commands.

This player claims to include a Sony mechanism and a Burr-Brown bitstream DAC. An electrical digital output is included to permit connection of an outboard DAC. The most interesting feature, however, is the Alpha 7's upgradability. It can be converted by a dealer to Alpha 8 or Alpha 8SE spec (for the sums of £150 and £299 respectively); or to Alpha 9 spec when the latter reaches the market.

### Sound quality

The listening panel was enthusiastic about this player, which easily outranked similarly-priced models auditioned alongside it. "It bounces along well," said one listener, while another remarked on its "nice timing and bass weight, definition and expressiveness," (Joni Mitchell). One listener thought the player was rather "thin and jangly," but he also acknowledged its strong resolution of detail, and its sense of pace and timing.

One sum-up comment called the bass to account on the grounds of having a "thuddy" quality, but the same listener praised the Alpha 7's expressiveness, and clearly enjoyed listening to it. Another described the player as "bouncy and rhythmic, with good

timing, and information" (Mendelssohn), then "tonally even-handed, with good clarity and definition," He concluded that the player was "easy to listen to" (Ry Cooder).

This, it seems to me, is a good reflection of this player's essential character. No-one could realistically compare this player with, say, a Krell, but the Alpha 7 in its current, much improved guise, gets as close to the music as one could reasonably hope to achieve at the price.

Its key strength is by performing music in an even-handed way, and imparting no obvious emphasis to music other than an occasional metallic treble edge. It epitomises "easy listening" by simply allowing music to shine through.

### Conclusion

Arcam's 'new' Alpha 7, an unequivocal improvement on its predecessor, must clearly be upgraded to a Best Buy. Quite possibly it's the ultimate 'mid-price' CD player — its resolving power, dynamics and neutrality are perfectly adequate, above average even, and it always sounds approachable and attractive. Best of all, when funds allow, you can build on your investment by upgrading its internals to those of a higher-spec Arcam player. *ac*

### VERDICT

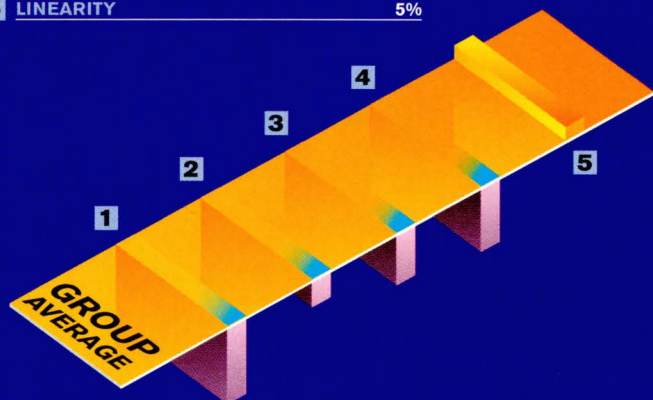
**SOUND** ★★★★★  
**VALUE** ★★★★★  
**PRICE** £329.90

(TWO YEAR GUARANTEE)

- ☐ A welcome return to form for this long-time favourite put it in pole position at the price. Now, can Arcam think about cleaning up the fascia and display?
- ✉ A&R Cambridge Ltd, Pembroke Avenue, Denny Industrial Estate, Waterbeach, Cambridge CB5 9PB
- ☎ (01223) 203203

### HOW IT COMPARES

1	SUPPRESSION OF DIGITAL IMAGES	-30%
2	JITTER	-10%
3	PRACTICAL DYNAMIC RANGE	-20%
4	HARMONIC DISTORTION VS LEVEL	-25%
5	LINEARITY	5%



### THE LAB REPORT

Improvements to layout, decoupling capacitors and PCB clamping (reducing its susceptibility to vibration) all herald the arrival of Arcam's 'updated' Alpha 7. This player featured in my *Oasis* column back in *HFC* 159 and was formally reviewed in *HFC* 163 where the subject of its ultrasonic requantisation noise was used to explain the player's unpredictable performance with different amplifiers. This inaudible noise is linked to the DAC (Burr-Brown's hybrid PCM1710) and still remains relatively unfiltered in the latest Alpha 7, unlike the NAD 522.

In common with the NAD 522 and older Alpha 7, this iteration still suffers from spurious idle pattern tones around 1kHz which reduce the overall S/N ratio from a possible 108dB to just 97dB. This, however, still represents a 5dB 'improvement' over the earlier Alpha 7. The +1.6dB/-2.3dB errors in low-level resolution are linked to the PCM1710, as is the widely varying harmonic distortion (0.004-0.6 per cent at -30dB). Nevertheless, Arcam's improved execution of this technology has prompted a very worthwhile reduction in jitter from 600psec (*HFC* 163) to 434psec. This alone justifies Arcam's tinkering and undoubtedly helps improve the competitiveness of the budget Alpha 7. *PMi*

# Denon DCD-1550AR

This model replaces the DCD-1015 (Recommended, *HFC* 141) as part of a complete new range. It's a heavy, solid and physically massive player, which appears to embody the kinds of engineering prowess and integrity that are more common at higher price-levels.

Styling is deliberately low-key but individual, and front-panel control buttons are intelligently laid out and well differentiated. An indented rotary track-selector knob makes this one of the more ergonomic players in its class, and the display is excellent, too: it includes a four-stage dimming circuit.

This player offers complete tape-editing options, including automatic space insertion and a peak-level search facility. It will fade tracks in and out to give your tape dubs a professional edge, while a pitch control varies replay speed up to 12 per cent in either direction, in 0.1 per cent increments.

Another rarity is index search, which permits the location of specific points within a track. For fans of classical CDs, where index points are most commonly encountered, this is a useful feature.

On the back panel you'll find two kinds of digital outputs: optical and electrical (S/PDIF). A 'synchro' socket connects the



CD player to a suitable Denon tape deck and automatically starts recordings when the music begins. There are both fixed-level and remote-variable analogue output sockets — stick to the fixed-level sockets for the greatest sound quality.

The DCD-1550's digital USP is its Alpha processor, which claims to operate up to 20-bit precision, using an 18-bit digital converter in conjunction with a discrete two-bit converter. This is said to use Denon's 'Super Linear' topology, which, the company says, "eliminates" certain forms of distortion. Separate digital and analogue power supplies aim to ensure clean power on tap.

## Sound quality

The panel score for this model was underwhelming, and listeners could not agree on what they were listening to. One enthused over the "excellent bass extension, good dynamic attack and control, and good detail — the intricate piano playing is well portrayed". But another felt that the only good feature was that "it did not break down". The more moderate and prevalent central line was that this player had a rather matter-of-fact sound, which lacked stereo differentiation and which sometimes seemed bland.

Comments about a "leaden" bass were made by several listeners, especially in the Mendelssohn orchestral piece, and there were also complaints about a "diffuse" and "swollen" soundstage, for example in the Ry Cooder track.

The bass did indeed seem rather heavy-handed in the hands-on tests. Although complex orchestral and vocal material was handled with aplomb through the midband, the treble sounded rather restrained, and this sapped the music of vitality, detail and presence. However it was not unpleasant, harsh or overtly 'digital'.

## Conclusion

Perhaps we should wait for the UK-optimised version of this player. If Denon's Alpha processor can be implemented as well here as it appears to have been in Denon's widely-respected high-end range, this could turn into an exciting player. In the meantime, the DCD-1550AR remains an intriguing design, with features to satisfy the gadget freak and the audiophile alike. Ultimately, though, it fails to hit a musical stride. **AG**

## VERDICT

**SOUND** ★★☆☆☆  
**VALUE** ★★☆☆☆  
**PRICE** £349.99

(ONE YEAR GUARANTEE)

Despite the high tech internals and the well-above-average build quality, this is a lacklustre performer that lacks detail and pace.

Hayden Laboratories Ltd, Hayden House, Chiltern Hill, Chalfont St Peter, Bucks SL9 9UG  
 (01753) 888447

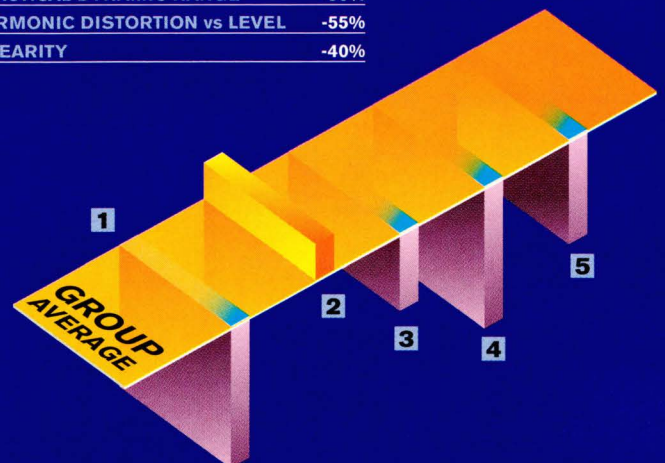
## THE LAB REPORT

Based on Denon's DCD-1015 (*HFC* 141), the DCD-1550 is a very unusual player. At its heart lies a pair of Burr-Brown's 18-bit PCM61P DACs supplemented, in this instance, by a discrete resistor-ladder network whose 2-bit contribution is summed with the 18-bit output of the DACs in the I-to-V op-amp. Convoluted, to be sure, but it's how Denon justifies the '20-bit' tag in its literature.

It also seems plausible, however, that this summing is responsible for the relatively huge jump in distortion from 0.003 per cent at peak output (2.0V) to 0.13 per cent at -30dB. Such a variation in distortion is unusual these days and must surely contribute to the warm 'colour' of the player's sound, along with other 'side-effects' of its technology, like the high +15dB noise modulation. Jitter is reasonably low at 367psec while low-level distortion, if not low-level linearity, is kept firmly in check. Nevertheless, it's the action of Denon's Alpha processing that has the potential to cause most sonic confusion. You see, under some circumstances, the DCD-1550's response is ruler-flat while, under others, it adopts a very droopy treble that's 6.8dB down at 20kHz. It all depends on how the CD was recorded. (I feel an *Oasis* coming on...) *PMI*

## HOW IT COMPARES

1	SUPPRESSION OF DIGITAL IMAGES	-55%
2	JITTER	15%
3	PRACTICAL DYNAMIC RANGE	-30%
4	HARMONIC DISTORTION vs LEVEL	-55%
5	LINEARITY	-40%



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Linn Kudos Tuner ..... (750.00) <b>£499.00</b>	Yamaha DSP E390 Processor (WOW!) ..... (249.00) <b>£129.00</b>



# Kenwood DP-5090

The DP-5090's family tree is headed by the DP-7090, the DP-5090's senior partner and predecessor, and an *HFC* Best Buy in issue 163. Like father, like son, the '5090 is a beast of a player: it's the biggest in this group, just ahead of Denon's DCD-1550AR. The Kenwood gives every indication of being well engineered, with a good-quality extruded aluminium fascia, and a front-panel control scheme mercifully free of clutter.

The unique selling point is CD Text, a system whereby album and track titles are encoded within unused portions of a CD's data structure. Suitably-equipped CD players have alphanumeric dot-matrix panels to display this information — which is also a key feature of the MiniDisc system. The display scrolls automatically to accommodate any disc, track and artist data that is too long for the display.

The number of CD-Text-equipped recordings is increasing, even though the system does not appear to have unanimous support from the music industry. At least albums are appearing at a greater rate, though the fact is not always mentioned on the CD packaging.

Under the hood, the DP-5090 is not 'just another' CD player. The key technical feature is a system dubbed D.R.I.V.E (Dynamic Resolution Intensive Vector Enhancement) technology, which claims to identify and combat digital quantisation noise using

to overwhelm the midband, which was felt to be "OK but thin" by one account, and "lacking in detail, with indistinct leading edges" by another.

Both of these listeners were referring to the Mendelssohn piece, though other test tracks fared similarly. A third listener reinforced the general view of an exuberant, perhaps too lively sound (primarily a treble phenomenon), but with a generalised loss of clarity when auditioned critically (mainly mid-band related).

There was more than a hint that the Kenwood suited some systems better than others, but there was no evidence that this indicated special sensitivity to particular amplifiers.

The hands-on listening suggested that this is indeed an exuberant player, which did, at times, sound a little ill-disciplined. The bass seemed satisfactory for the speakers used during unsighted listening; however, it seemed much more coherent when fed through smaller enclosures used during the hands-on tests.

'adaptive' low-pass filters.

The aim is to enhance the resolution of very low-level signals, especially below -60dB, where conventional CD players can become rather ragged and 'steplike' in their waveform recovery. D.R.I.V.E is combined with an allegedly 24-bit DAC and proprietary 'anti-jitter' circuitry.

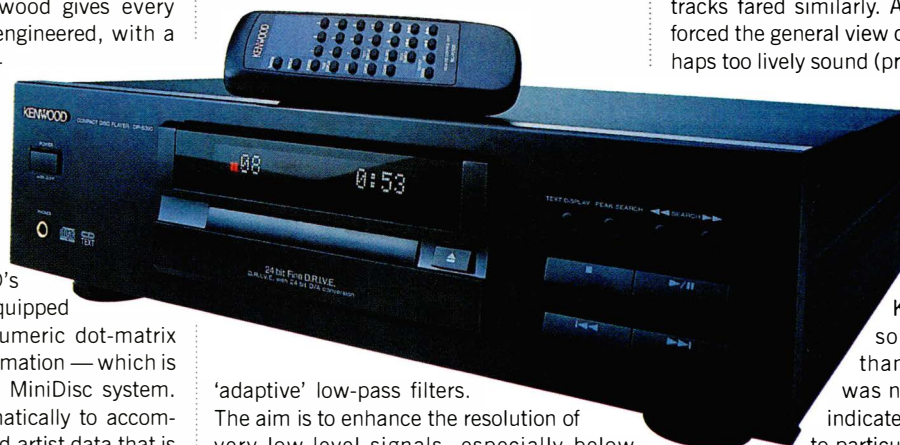
Output sockets are available for optical and electrical digital signals, and for headphones. There are two pairs of variable output sockets. System control sockets permit hook-up to other Kenwood hi-fi components.

## Conclusion

It's quite puzzling why the '5090 should receive such a lukewarm reception, when the cheaper DP-4090 (£250) garnered a Best Buy in *HFC* 172. What we have here is a well-equipped player, with civilised niceties like CD Text, but at the same time it sounds inescapably brash yet curiously flat at the same time. *AG*

## Sound quality

Whatever its technological credentials, this player underwhelmed our panel with its sound. They criticised it both for having a big and sometimes thick-textured bass, and for being rather grainy and coarse in the treble. Combined, these characteristics tended



## VERDICT

**SOUND** ★★☆☆☆  
**VALUE** ★★☆☆☆  
**PRICE** £299.95

(ONE YEAR GUARANTEE)

❏ The DP-5090 fails to tell a coherent story through the midband and treble, but is well built and offers the benefit of CD Text readout.

✉ Kenwood Electronics UK Ltd, Kenwood House, Dwight Road, Watford, Herts WD1 8EB  
 (01923) 816444

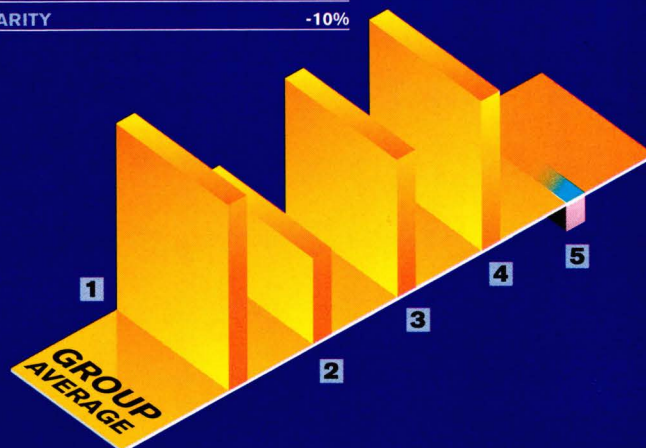
## THE LAB REPORT

Kenwood's choice of technology may be poles apart from that adopted by Denon, but at least both companies are striving to depart from the featureless landscape of the mass market. In this case, the DP-5090 behaves like a mix of the DRIVE technology used in its DP-7090 (see *HFC* 163) and the results expected from the MN35500 or MN35502 PEM DACs used by JVC. By way of example, the increase in mid-to-treble distortion from 0.0008 to 0.02 per cent at peak level (2.06V) was experienced with the DP-7090 as were the +2.7dB/-1.9dB wobbles in low-level linearity and superb >105dB rejection of spurious, digital images.

Meanwhile, the player's huge 113.5dB S/N ratio is only partially compromised by the high +10.9dB noise modulation, yielding a practical dynamic range that's well ahead of anything else in this survey. Also, distortion tends to settle-out at lower levels, reaching just 0.002-0.01 per cent right across the audioband at the musically-important -30dB level. Add to this a flat, ripple-free response, excellent suppression of ultrasonic noise, fast two-second (max) track access and low 295psec jitter and, on paper at least, you've got a persuasive player. *PM*

## HOW IT COMPARES

1	SUPPRESSION OF DIGITAL IMAGES	75%
2	JITTER	35%
3	PRACTICAL DYNAMIC RANGE	55%
4	HARMONIC DISTORTION vs LEVEL	60%
5	LINEARITY	-10%



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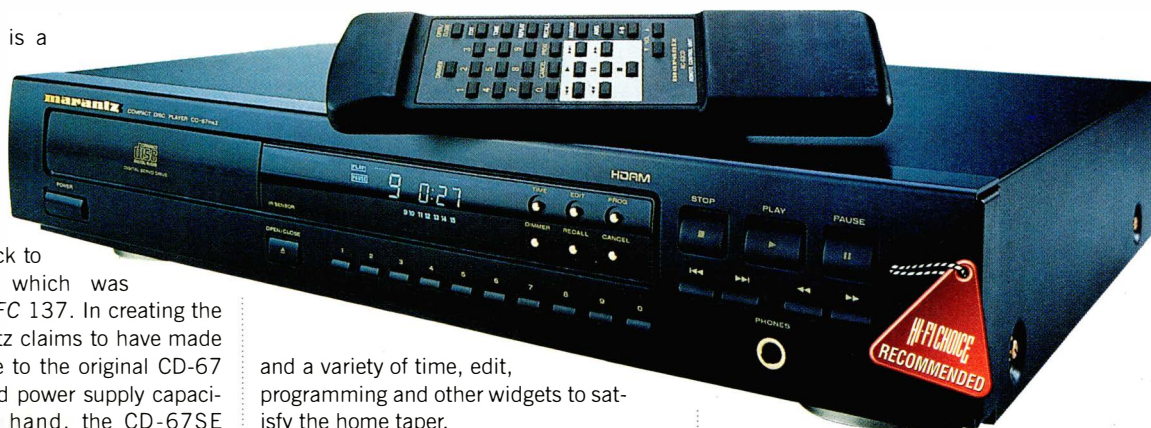
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# Marantz CD-67mkII

The CD-67mkII is a redesigned version of the original CD-67 (reviewed in *HFC* 159). However, the unit tested this month traces its lineage all the way back to the original CD-63 which was Recommended in *HFC* 137. In creating the mkII version, Marantz claims to have made only a minor change to the original CD-67 specification: updated power supply capacitors. On the other hand, the CD-67SE (Recommended, *HFC* 166) does incorporate substantial changes over its basis in the CD-67, and as you might expect, it carries an appropriately enhanced £350 price-tag.

In every respect this is the usual, slick Marantz package, with well-finished front panels discreetly enlivened by gold-coloured highlights and a classy-looking track-read-out display. The quiet, smooth-acting CD loader is partnered by a nimble mechanism.

Standard equipment includes: a headphone socket; a three-stage display-dimmer switch on both front panel and remote control; volume adjustment, also on the remote;



and a variety of time, edit, programming and other widgets to satisfy the home tapper.

The back panel is dressed for action with both optical and electrical digital outputs, and 'bus' inputs and outputs. These permit the user to connect the CD player with other Marantz components, and thus allow a single remote-control handset to operate a complete Marantz system.

## Sound quality

The original CD-67 failed to curry much favour on audition, and attracted persistent criticism of harshness and aggression. The panellists made similar criticisms this time round, but not quite with the same degree of vehemence. In fact, they quite enjoyed listening to this player, and returned an above-average score for its sound quality.

"I really liked this one — it's lean, detailed, and quite articulate, as well as being solid and enjoyable — no complaints," was one sum-up comment. Two other listeners clearly heard the Marantz in much the same way. Specific comments included: "enjoyable piano, easy to follow" (Handel); "controlled midband with a touch of sizzle" (Joni Mitchell); "tremendous sense

of space, very open, lots of subtleties and very lively" (Ry Cooder). Only one participant demurred, complaining of "brash, in-your-face vocals" (Ry Cooder); and "lots of upper-mid glare" (Mendelssohn).

In hands-on tests this player sounded quintessentially Marantz-like: warm, a little distant and understated, but with a fairly smooth, articulate quality overall, and an ability to take a back seat and allow the music to do its thing. This is not an overtly demonstrative kind of player, so you could take it down a peg for lacking the authority and dynamics of the best units. Another black mark might accrue for the slight edginess it develops when music becomes particularly dense and complex.

## Conclusion

The CD-67mkII's warm, distant balance will not suit every listener's tastes or system. But nonetheless this unit is clearly good value at £250: it is a warmly Recommended but characterful player, which usually manages to pull the right musical strings. *ac*

### VERDICT

**SOUND** ★★★★★☆  
**VALUE** ★★★★★☆  
**PRICE** £249.90

(ONE YEAR GUARANTEE)

- 📄 Elegant mainstream CD player is clean, articulate, if slightly distant-sounding. May help to tame a system with forward or aggressive sound.
- ✉ Marantz Hi Fi UK Ltd., Kingsbridge House, Padbury Oaks, 575-583 Bath Road, Longford, Middlesex UB7 0EH.
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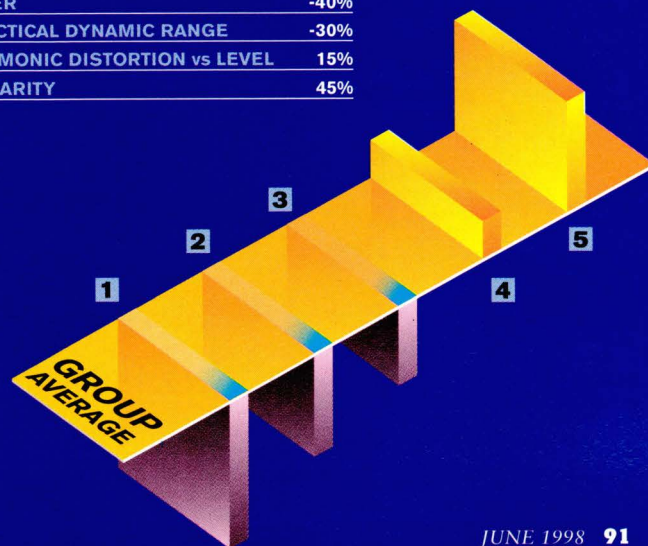
## THE LAB REPORT

Marantz's very popular CD-63/67 bandwagon continues to roll with yet another iteration on a familiar theme: the mkII version of the CD-67 reviewed in *HFC* 159. Once again, the player is based on an established formula of Philips CDM12 mechanism, servo and decoder chips with NPC's SM5872 oversampling filter/DAC bringing up the rear. I put this model through a thorough re-test in the lab and, to be frank, it's very difficult to point to any substantial difference between the technical performance of the mk II and mk I versions. Both offer a flat response, a higher-than-average 2.4V output level (don't be caught off-guard by unmatched demos), an appropriate 200 Ohm output impedance and 'average' 102.9dB S/N ratio.

Distortion maintains a steady pattern, increasing from 0.001 to 0.02 per cent at 0dB to 0.0016-0.03 per cent at -30dB while the characteristically huge 135-155dB channel separation remains a proud boast. If nothing else, the uncanny match in performance between all Marantz's CD-63/67 series is testament to the tight tolerances of its production environment. Of course, the 'sound' of the players is as likely linked to their unique jitter pattern — a complex cloud of sidebands amounting to 543psec in this player but whose nature has remained unchecked for years. *PMI*

## HOW IT COMPARES

1	SUPPRESSION OF DIGITAL IMAGES	-58%
2	JITTER	-40%
3	PRACTICAL DYNAMIC RANGE	-30%
4	HARMONIC DISTORTION vs LEVEL	15%
5	LINEARITY	45%



# Conclusions

In the introduction to this test, we set ourselves the task of answering a very simple question. This question is asked over and over again, by both hi-fi novices and audiophiles on a budget. Is it possible to buy a decent CD player with just a parsimonious outlay?

On the evidence of this test, the answer is "yes". However, we have also confirmed the old maxim that you get what you pay for. At the low end of the price range, there were some models that sounded far from refined. But, by the same token, some of the more expensive candidates failed to earn their sonic spurs.

This month's players showed roughly three levels of sonic achievement, indicated by the presence of Recommended and Best

Buy tags, or their absence. However, the Best Buys did include one model chosen in part for reasons other than sound quality, as you will read below. And it's just as likely that those who purchase this kind of machine will do so as much for its features as for its sound quality alone.

As you'll have read in the individual test reports, many of these machines offer quite sophisticated features for making up cassette-tape copies of albums. Most of the big-brand offerings even include a facility to synchronise playback with a cassette deck from the same family, putting an end to feverish button-jabbing and ensuring every precious second of music is captured for posterity.

All of this is rendered redundant, of

course, by the high-tech dubbing solutions now available in the form of MiniDisc and CD recorders. These make light work of copying your favourite albums, since they can copy a disc completely digitally, freeing the user from worries about turning over tapes and the like. The one prerequisite for such activity is a digital output on the source CD player — an option offered by many, but not all of the units tested here.

And when you go out to buy one of these players, don't forget our standing advice to audition the player of your choice before purchase — preferably with the amp and speakers you use at home, and better still with your system in your own listening room. Find your nearest dealer in our Dealer Guide (p94) and Dealer Directory (p132). *ac*

## GROUP A (UP TO £200)

<b>AMC CD9/DAC8</b>	<b>£199.99</b>
<b>NAD 522</b>	<b>£169.95</b>
<b>Sony CDP-XE310</b>	<b>£139.99</b>
<b>Technics SL-PS670D</b>	<b>£199.95</b>

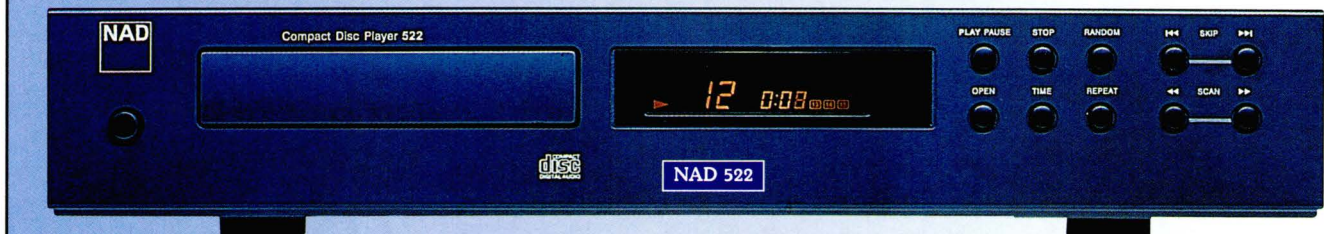
The £140 Sony CDP-XE310 put in an exuberant and lively performance. It's a welcome surprise to find such a high-octane performer at such a low price, but one listener did identify a brash, rather brittle quality which he ascribed instantly to a Sony

product. Take care with system matching. Still, this is a giveaway price, and the rotary track selector is an unmissable feature.

Sitting £30 further up the price ladder, the £170 NAD 522 failed to stir our musical souls. Its presentation of music is simply not in accordance with the sound of real musicians. Worse still, it has virtually no features — not even a digital output. We'd have excused the latter as being a quirk of NAD's ethos, if the sound had been more acceptable.

In its own right the AMC CD9 wouldn't show the NAD a clean pair of heels, but in combination with the DAC8 outboard D/A converter, it represents an impressive package costing only £30 more than the NAD. The AMC is not drowning with gadgets, but its sonic performance redresses the balance.

The £200 Technics SL-PS670D is a notably well-built, well-equipped player that won't disappoint. It's awash with features, many aimed at the home-taping enthusiast.



## GROUP B (ABOVE £201)

<b>Arcam Alpha 7 (improved)</b>	<b>£329.90</b>
<b>Denon DCD-1550AR</b>	<b>£349.99</b>
<b>Kenwood DP-5090</b>	<b>£299.95</b>
<b>Marantz CD-67mkII</b>	<b>£249.90</b>

The Marantz CD-67mkII (£250) is a typically svelte and accomplished player. It breaks no new ground for this marque, and looks almost identical to some other Marantz models, notably its own predecessor, the plain vanilla CD-67. If truth be told, the latter itself is only a couple of capacitors and a suffix short of the mkII. Nonetheless,

the new model is a smooth, elegant performer, which does appear to sound better than the CD-67. It should work well in a wide variety of systems for those who warm to the characteristic Marantz sound.

£300 nets the Kenwood DP-5090, which offers unique CD Text capabilities. Some may find the casework a little bulky. It's not a bad-sounding player by any means, but it is inferior to the models that flank it from Marantz and Arcam, and it even seems to be inferior to the DP-4090, its own less expensive brother.

There can be no such complaints about the recently revised £350 Arcam Alpha 7. It's a lively, outgoing and transparent player, and serves as a good taster for sound which normally commands a higher price.

The £350 Denon DCD-1550AR is rather enigmatic. The first in a new range from Denon, it appears to be a well-considered design, and has some impressive technology crammed under its hood. It is well equipped, and has an uncluttered user interface, but in the final analysis it failed to stir our emotions as much as some less expensive machinery.



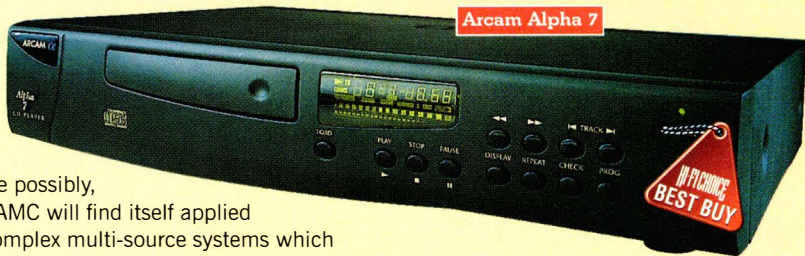
## BEST BUYS

Two models stood out from the crowd, one for extraordinary value, and the other for sheer musical excellence. Number one is the AMC CD9/DAC8, an unusual two-box player which consists of a complete CD player and an outboard DAC. One appeal of this package is its flexibility: the DAC8 will process 32kHz and 48kHz sampling frequencies as well as CD's 44.1kHz data.



AMC CD9/DAC8

IN PICKINGS BEST BUY



Arcam Alpha 7

IN PICKINGS BEST BUY

Quite possibly, the AMC will find itself applied in complex multi-source systems which include digital recorders; or even in home-built multi-room systems, where two analogue outputs (one on the player, the other a tape output on the DAC) provide clean sources for two listening zones.

The Arcam Alpha 7, in its recently revised form, is this month's second Best Buy. According to Arcam, the original Alpha 7's design

has been only very slightly tweaked to yield this model; but the sonic improvements are little less than dramatic. The improved model is more open, vivid and tactile than its forebear. If you are going to purchase one of these, remember that the 'improved' designation is ours, and get your dealer to confirm that the player you're offered has been made to the latest spec.

And don't despair if you've already purchased an 'unimproved' Alpha 7 CD — the modification is retrofittable for a small charge.

## RECOMMENDED



IN PICKINGS RECOMMENDED

Marantz CD-67mkII

Of the three Recommended models, the cheapest is something of a star. The £140 Sony CDP-XE310 has a bold, vivid, outgoing treble. It's not always the most civilised performer, and may offend some ears in some systems, but it remains exceptional value. It's well worth auditioning if you're strapped for cash — in the right circumstances it can work miracles.

In many respects, the £200 Technics SL-PS670D resembles

its more expensive namesake, the SL-PS770D, but boasts a simpler digital converter and associated circuitry, hence slightly less gripping music-making. Nevertheless, it's a lucid and effective player which is well equipped, and handles discs better than most.

The £250



Sony CDP-XE310

IN PICKINGS RECOMMENDED

Marantz CD-67mkII is firmly cast in the family mould, with a smooth, even, yet slightly distant sound. At the same time, however, it is a crisp and detailed sounding player, but remains easy on the ear.



Technics SL-PS670D

IN PICKINGS RECOMMENDED

## BEST OF THE REST

Below the £350 price-point there are rich pickings for value-conscious CD users. Unsurprisingly there are a number of alternative models from brands represented in this month's test. For example the AMC CD8A, which is by no means a state-of-the-art machine, but offers a lot of equipment for a paltry £150. Rather better at the same price is the Cambridge Audio CD4, its SE variant at £200 and the



Cambridge Audio CD4

sharp, refined CD6 which costs £250. Though Denon's DCD-1550AR made a mixed showing this month, the DCD-635 might be worth considering at £180. Teac's sub-£200 star-buy is the CDP-3450SE, while two excellent Kenwood models are the DP-3080 at £170 and the DP-4090 which costs £250. Other possibilities include the JVC XL-Z674BK at £300 and the Philips CD-721 at £130.

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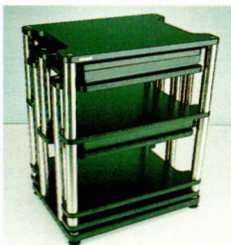
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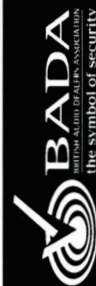
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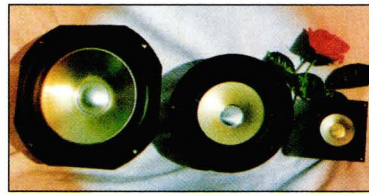
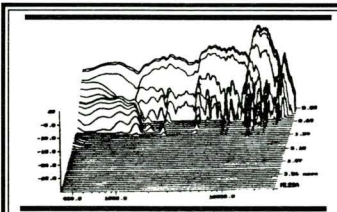
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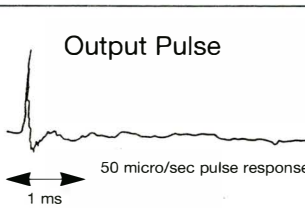
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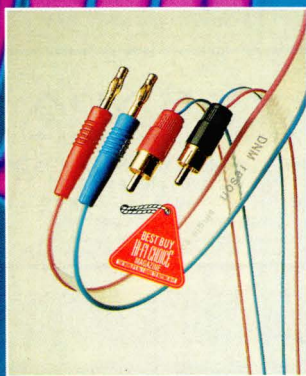
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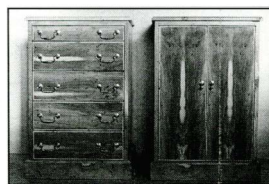
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# Reader classified

## Advertise in Hi-Fi Choice for £5\*

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- Cyrus PSX-R power supply, £195. Cyrus DAD7 CD player, £540. Soundstyle stand X050 (blue), £100. Middlesex (01932) 225783.
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**T**o advertise on this page, write your advert in block capitals and send it to: *Hi-Fi Choice*, Reader Classifieds, 19 Bolsover St, London W1P 7HJ. Include a cheque for £5\* made payable to Dennis Publishing Ltd. The advert will appear in one issue only and must be no more than 20 words (or five lines) long, including all spaces and your phone number. Reader Classifieds are for the use of private individuals only. All Reader Classified adverts will be printed on a first-come, first-served basis, subject to available space, and Dennis Publishing Ltd accepts no liability for the accuracy of the information contained therein, nor any consequence arising from it, nor for any typographical errors. We reserve the right to amend or refuse adverts at the Editor's discretion and cannot guarantee that an advert will appear in any specific issue.

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- Kelly KT3s, mint, £800. Marantz CD17 Kl Sig, £720. Audio Analogue pre-power amps, mint, £700. Musical Fidelity X-PRE, £120. Sugden SF100 amp, £480. All items new, or as new, and boxed. Oakham (01572) 723198.
- Laserdiscs for sale, PAL/NTSC. Hundreds of titles, Tel/fax for list, 1pm to 8pm, (01704) 833601.
- Linn Keilidh speakers, with composite bases, boxes, excellent condition, £350. East Yorks (01757) 630573.
- Linn LK100 power amps, boxed and in top condition, four for £1,750 ono, or will split. Nick, Stockport (0161) 429 0963.
- Linn LP12 Rosewood finish, Valhalla power supply, Akito arm, Dynavecator cartridge, brand new, boxed, never used, £1,200. London (0958) 950070.
- Linn Mimik CD player,

- mint condition, £450 ono. Bridgnorth (01746) 862629/861279.
- Linn Sondek LP12 Valhalla, Basik plus arm, K9, Aphromasia, £425. Epos ES14 speakers, black ash, dedicated stands, £375. Both mint. Manchester (0161) 439 5122.
- Lowther Bicolor 2000 cabinets (pair), American walnut, unused, £130. (01229) 885214.
- Marantz CD-67SE, Arcam Alpha 8, KEF Q15, complete with stands, cables, interconnects, boxes, used one year, £500. Cardiff (04677) 862352.
- Meridian M60 active loudspeaker R/W, £1,400. Meridian M60C active centre £750, Meridian A/V 541 £750 with MSR, Mission 754F, black £750. Cyrus XPA £220, Linn Local £220. All 8 months old, mint, boxed. Loughborough (01509) 219489/(0498) 712975.
- Mission 751 speakers, black, two years old, VGC, £125. East Kent (01227) 364820.
- Mission 752, rosewood, £350. SME 309 tonearm, £450. Goertz M2 speaker cable, £25, one yard. DNM Reson speaker cable, 4x5m, £98. (01582) 724414.
- Naim 110 power amp, boxed, immaculate, £165.

- Rotel RCD 965BX CD player, boxed, immaculate, £175. Both sales due to upgrading. Bromley (0181) 325 0902.
- Naim CDS CD player (new £3,940), £3,200 ono. SNAOXO Clover (new £770), £600 ono. Both only eight months old. HICAP (new £720), £650 ono. Unused, sealed box. All mint, boxed. Reading (0118) 946 1421 eve/(0118) 958 5463.
- Nakamichi Dragon cassette deck, mint condition, boxed/manual, rarely used (1989), £1,095 ono. Redditch (01527) 65444 work/(01527) 892740 home.
- Nakamichi 700 ZXL computing cassette deck, full service, £750. Krell KSP 7B preamp (£3,200), £850. Sumo 9 Plus Power Pure Class A (£1,200), £450. All immaculate and boxed. London (0181) 523 1134.
- Pioneer PDS-904, was £400, will accept £200 ono, mint condition. Essex (01268) 786299 (Steve).
- Quad 34, £125. Nakamichi 582, £300. Aura VA-80, £150. Thorens TD160VI/RB250, £225. Heybrook HB3/2 plus stands, £250. Warks (01926) 740254.
- REL Storm subwoofer, £375. Tannoy Mercury II loudspeakers, £80. Excellent condition. Aylesbury (01296) 431119.

- Rotel RCD 970BX CD player, boxed, as new, £160. (01556) 504445.
- Tandy D500 speakers, rosewood, one year old, ex condition, £895. Rotel RB990BX power amp, 200 Watts p/ch min (RMS), one year old, ex cond, £425. Kent (01304) 381101.
- Sony MDS-JA30ES mini-disc player, new, boxed, never used since purchase, £500. London (0958) 950070.
- Sony Minidisc JA3ES, boxed, 6 months guarantee £390 ono (01382) 541589.
- Sony TC-K6003 three-head cassette, Dolby BC&S, bias control, 10 months old, boxed, mint, £140. Sony TA-FA3ES 5star amplifier, 70 Watts pch, remote, six inputs, pre-out sockets, boxed, mint, £199. Castle type speaker stands. Nottingham (0115) 952 1820.
- TDL RTL 3 speakers, rosewood, in mint condition with shiny new grills. Yours for only £120. Bargain. Buyer collects. Dartford (01322) 228997.
- Teac P700/D700 Transport and DAC. Mint, boxed, two years old. £1,500 new, accept £690. York (01904) 708382.
- Teac H300 Reference system, £325. Linn KAN II stands bi-wire, £225. Meridian 551 209, £445. 2 x 5m Silver, £40. Norfolk (01493) 851296.
- Yamaha DSP-A3090 audio-visual AC-3 amplifier, £750. Theta TLC de-jitterer, £100. Audio Alchemy DAC-in-a-Box, £100. Pioneer F-91 Reference digital FM/AM tuner, £125. (01945) 463077.
- Yamaha E492 processor, new, Nov 97, mint condition, £175. Reason for sale: upgrading. Cheshire (01270) 501127.

### WANTED

- REL Stadium or Stentor subwoofer. Coventry (01203) 679165.
- Yamaha stereo receiver CR-1000, any condition considered. (01903) 859253, evenings.

# THE DIRECTORY

## Our Three Step Guide to Buying Hi-Fi

The legendary *Hi-Fi Choice* Directory is now simpler to use than ever before, but contains all the information you need to select and buy the perfect hi-fi system.

**STEP 1** Discover which products fall within your budget by using our Price Guide (starts on the next page). This listing is updated bi-monthly and includes all hi-fi products currently available in the UK. It is organised by product type, then by price band, and is sorted alphabetically. Products whose names are printed in **red** are those we have reviewed. That leads us to...

**STEP 2** Read about the hi-fi equipment we have reviewed in the Directory (starts after the Price Guide). Here you will learn which items have been singled out for our famous Best Buy and Recommended awards that denote products of exceptional quality and value. The Directory is sorted by product type and listed alphabetically, and the beginning of each section provides essential information about each kind of hi-fi component.

**STEP 3** Find your nearest hi-fi store in our Dealer Directory (at the end of the 'reviewed product' directory) to book a demonstration of the products you are interested in.

## Best Buys and Recommendations

If you see a Best Buy (**red**) or Recommended (**blue**) flag at the beginning of an entry in our Directory of reviewed products, the item concerned is particularly deserving of your attention.

**B** **Red** signifies the Best Buy swing-tag, which indicates products of the best quality and superb value for money in their price category.  
**R** **Blue** Recommended products offer excellent quality and value, but not the same cost-effectiveness as a Best Buy.

Please note that an expensive Recommended product will nearly always perform better than an inexpensive Best Buy.

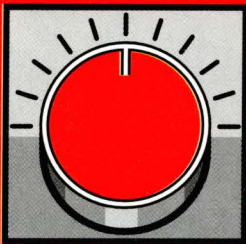
### Using Best Buys and Recommendations to buy hi-fi

Do not commit the cardinal sin of dashing into your local dealer, magazine in hand, demanding to purchase Best Buy CD player A, Best Buy amplifier B and Best Buy speakers C. This is unlikely to result in your long-term satisfaction. Our belief at *Hi-Fi Choice* is that you must consider the hi-fi system as a complete entity, not as a collection of components. While a superb system might well contain Best Buy and Recommended components, one cannot lump together Best Buys and Recommendations in the hope that they will automatically perform superbly. These ratings make a useful guideline for short-listing components worth trying, but only by hearing them for yourself can you draw meaningful conclusions about what suits your taste. Furthermore, don't panic if the dealer offers you equipment that we have not tested. At the end of the day, what matters most is that your hi-fi system fits your tastes like a glove, and it is the dealer's challenge to ensure your satisfaction by any means – and components – necessary!



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AMPLIFIERS INTEGRATED

KEY
(5) = number of line-level inputs.
'20W' = output power per channel into nominal load of 8 Ohms.

Up to £250

Table listing various amplifier models such as Akai AM1100, AMC 3020, Denon PMA-250SE, and Yamaha AX-390, with their respective features and prices.

£251 to £500

Table listing amplifier models in the £251-£500 price range, including Alchemist Maxim, Denon PMA-725R, and Yamaha AX-492.

Table listing amplifier models such as Marantz PM-68, Onkyo A9210, and Technics SU-A800D Mk2, with prices ranging from £100 to £280.

£501 to £700

Table listing amplifier models in the £501-£700 price range, including Alchemist Kraken APD6A, Audio Note Kanji Line SE, and Linn Majik (Phono).

£701 to £1000

Table listing amplifier models in the £701-£1000 price range, including Alchemist Forseti Integrated, Audio Note Oto Line PP, and Marantz PM-17.

£1001 to £2000

Table listing amplifier models in the £1001-£2000 price range, including Art Audio Integra, ATC SIA2-150, and Audio Note Oto Line SE.

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"This pre/power combo gets behind the recording and hi-fi... it simply makes music!" Alan Sircom, HI-FI Choice, November 1994

For more information or your nearest stockist, ☎ (0181) 947 5047, or e-mail 73064.1710@compuserve.com

audio research HIGH DEFINITION

Large table listing various audio components including amplifiers, preamps, tuners, and recorders from brands like Bow Technologies, Bryston, Copland, Denon, and others, with prices ranging from £100 to over £2000.

Table with 2 columns: Product Name (e.g., Conrad-Johnson PV-10AL, Conrad-Johnson PV-10A) and Price (e.g., 995, 1,295, 1,990). Includes various audio components like amplifiers, speakers, and headphones.

Table with 2 columns: Product Name (e.g., Trilogy 902, Tron Retro, Tron Nucleus) and Price (e.g., 1,595, 1,000, 2,000). Includes a 'KEY' box with output power specifications: '20W' - output power per channel into nominal load of 8 Ohms. Up to £500.

Table with 2 columns: Product Name (e.g., AMC CVT 2030A, Arcam Alpha 8P) and Price (e.g., 300, 400, 250). Includes various audio components like amplifiers, speakers, and headphones.

Table with 2 columns: Product Name (e.g., Mission Cyrus XPA, Mission Cyrus Power, Moth 30 Series Power) and Price (e.g., 50W, 50W, 498). Includes various audio components like amplifiers, speakers, and headphones.

Table with 2 columns: Product Name (e.g., Alchemist Kraken pwr, Alchemist Forseti Pwr, AMC CVT 2100A) and Price (e.g., 60W, 150W, 80W). Includes various audio components like amplifiers, speakers, and headphones.

Table with 2 columns: Product Name (e.g., Densen DM-30, DNM PA Start, DNM PA1 Start) and Price (e.g., 1,000, 45W, 45W). Includes various audio components like amplifiers, speakers, and headphones.

Table with 2 columns: Product Name (e.g., DPA Enlightenment pwr, Earmax Power, ECA Lectern S) and Price (e.g., 100W, 25W, 50W). Includes various audio components like amplifiers, speakers, and headphones.


Table with 2 columns: Product Name (e.g., Moth 60 Stereo, Moth 30 Mono/100, Muse Model 100) and Price (e.g., 60W, 100W, 100W). Includes various audio components like amplifiers, speakers, and headphones.

Table with 2 columns: Product Name (e.g., Naim NAP140, Naim NAP180, Naim NAP135) and Price (e.g., 45W, 60W, 75W). Includes various audio components like amplifiers, speakers, and headphones.

Table with 2 columns: Product Name (e.g., Sumo Polaris III, Sumo Model Five, Sumo Andromeda III) and Price (e.g., 164W, 60W, 240W). Includes various audio components like amplifiers, speakers, and headphones.

Table with 2 columns: Product Name (e.g., Adyton Cordis 1.6, Adyton Cordis 3B, Alchemist The Alchemist pwr) and Price (e.g., 120W, 280W, 220W). Includes various audio components like amplifiers, speakers, and headphones.

DNM PA3S	23W	3,750
DPA DAP500S	250W	3,000
Dynavector HX75	75W	2,195
Dynavector HX1.2	130W	3,995
EAR 861	32W	3,299
EAR 509 Mk II	100W	3,699
EAR 519	100W	4,699
EAR 549	200W	6,499
Electrocompanion AW100DMB	100W	2,095
Electrocompanion AW120DMB	120W	2,695
Electrocompanion AW250DMB	250W	3,995
Electrocompanion AW180MB	180W	4,595
Exposure IV	80W	2,199
Exposure XVI	125W	4,000
Gamma Aeon	20W	4,999
Gamma Space Ref	18W	7,999
Gamma Aeon Ref	70W	49,999
Graaf 5050	50W	2,150
Graaf GM20	60W	2,750
Graaf GM100	100W	4,490
Graaf GM200	200W	8,000
Jadis DA8	80W	3,333
Jadis DA7	100W	5,290
Jadis JA30	30W	5,980
Jadis JA300B	10W	9,000
Jadis JA80	60W	9,912
Jadis JA200	160W	15,518
Jadis JA500	400W	21,500
Krell KAV500/2	100W	3,485
Krell FPB200	200W	6,490
Krell FPB300	300W	9,500
Krell FPB600	600W	12,900
Krell KAS2	200W	20,000
Lexicon 225	250W	2,500
Lexicon 501	500W	5,000
Linn Klout	80W	2,400
Lumley M125	120W	3,750
Lumley M250	250W	7,500
Magnum Class A mono	180W	2,450
Magnum 2A00SE	275W	3,750
Mark Levinson 331	100W	4,495
Mark Levinson 332	200W	6,495
Mark Levinson 333	300W	8,495
Mark Levinson 33H	150W	19,395
Matisse Ref Monoblocks	180W	8,000
Meracur Tentare	75W	2,245
Meracur Cantare	-W	8,995
Muse Model 160 Ser. II	160W	2,290
Muse Model 150	125W	2,690
Muse Model 175 Ser. II	175W	3,490
Muse Model 300 Ser. II	300W	3,990
Musical Fidelity F16	200W	2,500
Musical Fidelity F19	300W	4,000
Papworth M100	100W	2,645
Papworth M200	200W	3,825
Roksan ROK-M1.5	160W	2,250
Shearman Phase 1 Pwr Ref	160W	2,199
Siemel TA20	100W	2,350
Sonic Frontiers Power 1	55W	2,495
Sonic Frontiers Power 2	110W	4,995
Sonic Frontiers Power 3	220W	9,995
Sumo Model Ten/M	240W	4,200
Sunfire Sunfire	300W	2,170
T+A A3000	190W	3,000
Talk Electronics Tornado 5	200W	2,100
Tesserac TAMP-60	60W	7,350
Trilogy 958T	45W	3,395
Trilogy 958	100W	3,395
Tube Tech Genesis Sig.	100W	4,700
Tube Tech Synergy DMA	150W	6,400
Unison Smart 845	24W	3,250
Unison Palladio	32W	11,995
Van Den Hul Power amp	65W	2,990
XTC POW-1	200W	2,250
YBA 2 stereo		2,200
YBA 1 HC stereo		4,999



**CABLES**  
**ANALOGUE INTERCONNECTS**

**KEY**


- ☉ - stranded construction.
- - solid-core construction.

Prices of interconnects are for a one-metre terminated pair.

Apertura Model B	260.00
Apertura Model A	469.00

Art Yam Church 5000	515.00
Audio Note AN-A	18.00
Audio Note AN-C	35.00
Audio Note AN-S	99.00
Audio Note AN-V	179.00
Audio Note AN-Vx	450.00
Audioquest Jade	30.00
Audioquest Turquoise 2	40.00
Audioquest Topaz 2	59.95
Audioquest Ruby 2	80.00
Audioquest Quartz	125.00
Audioquest Opal	200.00
Audioquest Emerald	260.00
Audioquest Lapis	399.00
Audioquest Diamond	549.00
Cable Talk Improved 2/CD	26.00
Cable Talk Advanced 2	34.95
Cable Talk Improved 2/Tape	47.00
Cable Talk Monitor 2.1	50.00
Cable Talk Studio 2	65.00
Cable Talk Professional 2	85.00
Cable Talk Broadcast 2	100.00
Cable Talk Reference 2	150.00
Cable Talk Signature 2 Gold	300.00
Cambridge Atlantic	10.00
Cambridge Arctic	20.00
Cambridge Pacific	30.00
Cambridge Studio Reference	40.00
Cambridge Silver Spirit 40	70.00
Cambridge Silver Spirit 60	100.00
Cardas Audio 300B-Microtwin	115.00
Cardas Audio Quadlink-Five	200.00
Cardas Audio Cardas Cross	360.00
Cardas Audio Hexlink-Five C	530.00
Cardas Audio Hexlink Golden-5 C	600.00
Cardas Audio Golden Cross	700.00
ChordCo Chrysalis	33.00
ChordCo Cobra 2	50.00
ChordCo Siren	65.00
ChordCo Chameleon	85.00
ChordCo Solid	99.00
ChordCo Chorus	185.00
Connections UK Ultra	28.00
Connections UK Midas	39.00
Connections UK HD	46.00
DBF Acoustics Black Velvet	30.00
DBF Acoustics Black Velvet SE	40.00
DBF Acoustics Azure SE	75.00
DNM-Reson TCC75	34.00
DPA Slink	41.00
DPA White Slink	75.00
DPA Black Slink	245.00
Expressive Tech IC-1	700.00
Gamma Wow Balance	799.00
Goertz M1 Interconnect	145.00
GT Audio Intercon	130.00
Henley HSP10	20.00
Henley HSP50	35.00
Henley HSP100	65.00
Henley HSP200	95.00
Heybrook Black Flash	49.95
Insert Audio Focus 1.2	21.50
Insert Audio IC100 Mk II	46.95
Insert Audio Status 3.4	160.00
Ixos 104	20.00
Ixos 1003	30.00
Ixos Gamma 1002	39.95
Ixos 103	45.00
Ixos 102	60.00
Ixos 101	100.00
Ixos 100.X03	150.00
Kimber PBJ	68.00
Kimber KC1	96.00
Kimber Hero	110.00
Kimber Silver Streak	180.00
Kimber KCAG	390.00
Kimber KCTG	720.00
Kronos Konnekt 3	49.00
Kronos Konnekt 2	99.00
Kronos Konnekt 1	199.00
LAT International IC-50	37.00
LAT International IC-80	60.00
LAT International IC-100-D	89.00
LAT International IC-200 Mk II	151.00
Lieder Chanson	340.00
Lieder Lek	420.00
Lieder Het Lied	420.00
Lieder Song	580.00
Lieder Maas	620.00
Lieder Rijn	1,000.00
Lieder Waal	1,400.00
Lumley Silver 12/2	115.00
Lumley Silver 14/4	175.00
Moth Leyline Black	100.00
Moth Leyline Grey	200.00
Nordost Magic	35.00
Nordost Black Knight	60.00
Nordost Blue Angel	98.00
Nordost Blue Heaven I/C	144.95
Nordost Red Dawn	285.00
Nordost SPM	825.00
Ortofon 7N interconnect	250.00
Precious Metals Silver Signal 35	40.00

Precious Metals Silver Signal 50	50.00
Precious Metals Silver Signal 52	70.00
Precious Metals Silver Signal 53	90.00
Precious Metals Silver Signal 100	100.00
Precious Metals Silver Signal 102	130.00
Precious Metals Silver Signal 103	160.00
Precious Metals Silver Signal 104	190.00
Precious Metals Silver Signal 200	220.00
Precious Metals Silver Signal 202	290.00
Precious Metals Silver Signal 203	360.00
Precious Metals Silver Signal 204	430.00
Prowire Silver	60.00
PAD Elementa	145.00
QED Qneet 2	30.00
QED Qneet 4	60.00
Roksan ROK-Intercon	75.00
Shiny Red Devil	80.00
Shiny Red Star 2	120.00
Shiny Black Star 2	240.00
Shiny Pulsar 2	495.00
Shiny Quasar 2	850.00
Siltech MC2-12	308.00
Siltech MC4-24S	400.00
Siltech FTM-3S	730.00
Silver Sounds SS2	99.00
Silver Sounds SS1	199.00
Silver Tone Ex-Static	35.00
Silver Tone Sci-Fi	95.00
SME S2LB-4	46.18
SME S3LB-4	52.06
SME 4900A	76.83
SME 5900A	102.57
Sonic Link Red	25.00
Sonic Link Silver pink	35.00
Sonic Link Black	49.00
Sonic Link White	65.00
Sonic Link Brown	70.00
Sonic Link Violet	85.00
Sonic Link Maroon	125.00
Sonic Link Blue Nickel	150.00
Sonic Link Vermillion	195.00
Sonic Link Red earth	300.00
Sonic Link Black earth	450.00
Sonic Link Blue earth	695.00
Sonic Link Black Rhodium	995.00
Straightwire Chorus	40.00
Transparent Cable Musichord Int	48.00
Transparent Cable The Link	92.00
Transparent Cable Music Link	119.00
Trichord Pulswire 75	169.00
Vampire Wire CC	24.00
Vampire Wire CCC/II	58.00
Vampire Wire SC/II	98.00
Vampire Wire SC/IV	144.00
Vampire Wire AI/2	259.00
Vampire Wire SL	412.00
Van Den Hul Storm	25.00
Van Den Hul Source HB	50.00
Van Den Hul D102 III	69.99
Van Den Hul Thunderline HB	130.00
Van Den Hul Second	210.00
Van Den Hul Gold	240.00
Van Den Hul MC Cord	82.50
Van Den Hul MC Silver IT	1,240.00
Van Den Hul MC Silver IT Bal	1,560.00
Wireworld Orbit	30.00
Wireworld Solstice II	40.00
XLO Type 150	50.00
XLO Type 0.1	180.00



**DIGITAL INTERCONNECTS**


**KEY**

- ☉ - stranded construction.
- - solid-core construction.

Prices of interconnects are for a one-metre terminated pair.

Apertura Model B	139.00
Apertura Model A	255.00
Apogee Digital Wyde Eye	20.00
Apogee Digital Wyde Eye Bal.	30.00
Art Yam Church 5000	275.00
Audioquest Digital/video 1	30.00
Audioquest Digital/video 2	60.00
Audioquest Optilink X	90.00
Audioquest Digital Pro	100.00
Audioquest Optilink Pro	149.00
Audioquest Optilink Z	179.00

Cable Talk Digital 2	78.00
Cardas Audio Lightning	190.00
ChordCo Codac	36.00
ChordCo Prodac	50.00
DNM-Reson DIG100	26.00
DPA Opti-link	20.00
DPA Digi-link	28.00
Insert Audio Dataline 500	24.95
Insert Audio Dataline 700	39.95
Insert Audio Image 5.1	44.95
Ixos 105	25.00
Ixos 106	30.00
Kimber Opti-link	50.00
Kimber Illuminati DV-30	70.00
Kimber Illuminati D-60	325.00
Kimber Illuminati DX-50	350.00
Kimber Illuminati Orchid	750.00
LAT International DI-20-D	79.00
Moth Leyline Datalink	140.00
Nordost Moonglo	155.00
Precious Metals Silver Dig 35	20.00
Precious Metals Silver Dig 100	50.00
Precious Metals Silver Dig 200	110.00
Precious Metals Silver Dig 202	145.00
QED Digiflex	20.00
QED Optiflex	25.00
Roksan ROK-Intercon	45.00
Shiny Digital	265.00
Siltech HF-6	145.00
Sonic Link Green	60.00
Transparent Cable PDL	199.00
Trichord Pulswire 75D	75.00
Trichord Pulswire 110D	145.00
Vampire Wire DI/1	150.00
Van Den Hul Source HB	30.00
Van Den Hul Videolink	60.00
Van Den Hul AES-EBU 110	65.00
Van Den Hul First	125.00
Van Den Hul Second	130.00



**SPEAKER CABLES**

**KEY**

- ☉ - stranded construction.
- - solid-core construction.

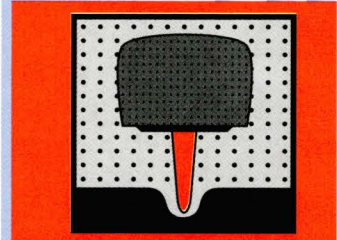
Price per mono metre untermated.

Acoustic Energy AESC-C3	11.95
Apertura Silver	82.50
Art Yam Church M2000	470.00
Art Yam Church 5000	795.00
Audio Note AN-D	4.50
Audio Note AN-B	16.50
Audio Note AN-L	29.50
Audio Note AN-SP	150.00
Audio Note AN-SPx	450.00
Audioquest Type 2	3.50
Audioquest F-18	3.60
Audioquest Type 6+	9.00
Audioquest Indigo +	15.00
Audioquest Crystal +	25.00
Audioquest Forest	75.00
Audioquest Argent +	125.00
Audioquest Clear 3	200.00
Bandridge LC7409	4.00
Bandridge LC4110	28.00
Bandridge LC3410	40.00
Bandridge LC3210	75.00
Bandridge LC3219	75.00
Bandridge LC3220	90.00
Bandridge LC3310	95.00
Bandridge LC3240	125.00
Cable Talk Theatre 2	1.50
Cable Talk The Flat One	2.00
Cable Talk Talk 3.1	2.25
Cable Talk Overture 2.1	3.25
Cable Talk Talk 4.1	4.25
Cable Talk Talk 3.1 Biwire	4.50
Cable Talk Concert 2.1	7.00
Cable Talk Talk 4.1 Biwire	8.50
Cable Talk Symphony 3	12.50
Cable Talk Concert 2.1 Biwire	14.00
Cardas Audio 300B-Microtwin SC	35.00
Cardas Audio Quadlink-Five SC	59.00
Cardas Audio Cross SC	99.00
Cardas Audio Hexlink-Five SC	109.00
Cardas Audio Hexlink Golden5 SC	175.00
Cardas Audio Golden Cross SC	789.00
ChordCo Myth	6.00



ChordCo Legend	15.00
DNM-Reson LSC	6.95
DNM-Reson LSCB	11.95
DPA Black Sixteen	100.00
Electrocompaniet EC-K2	30.00
Gale XL105	1.00
Gale XL189	1.00
Gale XL315	2.00
Gale XL160-2	2.50
Gale XL315-2	3.99
Gamma Wonder Line	99.00
Goertz M1	16.00
Goertz M2	32.00
Goertz Big Boy	64.00
GT Audio Speaker	50.00
Ixos 607	2.00
Ixos 6004	3.00
Ixos 6003	3.00
Ixos 605	3.00
Kimber 4PR	3.90
Kimber 4VS	9.00
Kimber 4TC	19.60
Kimber 8TC	32.70
Kimber 4AG	394.00
Kimber 8AG	656.00
LAT International SS 800	21.00
LAT International BIWIRE	27.00
LAT International SS 1000	42.50
Lieder Pad	340.00
Lieder Bel Canto	450.00
Lieder Spoor	580.00
Lieder Straat	1,000.00
Lieder Weg	1,400.00
Linn K20	4.00
Linn K400	10.00
Linn K600	15.00
Lumley Silver 12/2	35.00
Lumley Silver 14/4	40.00
Mission Duet	1.90
Mission Quartet bi-wire	3.90
Naim NACA 5	5.50
Nordost Octava	3.00
Nordost 4-Flat	12.00
Nordost Blue Heaven Spkr	55.00
Nordost Red Dawn	110.00
Nordost SPM	325.00
Ortofon SPK100	3.00
Ortofon SPK200	5.00
Ortofon SPK300	8.00
Precious Metals Silver Lr 32	7.50
Precious Metals Silver Lr 102	10.00
Precious Metals Silver Lr 34	15.00
Precious Metals Silver Lr 104	20.00
Precious Metals Silver Lr 106	30.00
Precious Metals Silver Lr 108	40.00
Puresonic OFC 7892	1.20
Puresonic OFC 7844	1.65
Puresonic OFC 7845	1.95
Puresonic OFC 7891	2.85
Puresonic OFC 7816	3.75
Puresonic OFC 7832	3.75
Puresonic OFC 7812	3.75
Puresonic OFC 7825	6.95
Puresonic PSOCC 7801	9.50
Puresonic PSOCC 7802	18.00
Puresonic PSOCC 7803	27.00
QED Qudos Micro	1.25
QED Qudos micro 4 core	2.00
QED Qudos 4 core	4.00
QED Qudos Bi-Wire	4.50
QED Qudos Silver	4.95
QED Profile 4x4	9.00
QED Profile Silver 12	15.00
Rega REGA	2.00
Roksan ROK-Speaker	6.00
Shinpy Red Devil	30.00
Shinpy Red Star 2	39.00
Shinpy Black Star 2	62.00
Shinpy Pulsar 2	104.00
Shinpy Quasar 2	208.00
Siltech LS2-45	109.00
Siltech FT-12 MkI	240.00
Siltech LS4-120	549.00
Silver Sounds 12 Gauge	15.00
Silver Sounds 10 Gauge	35.00
Silver Sounds 8 Gauge	75.00
Silver Tone Silver-Sonic	10.00
Silver Tone Silver-Sonic HC	15.00
Silver Tone Silver-Voice	55.00
Silver Tone Silver-Voice Ultra	85.00
Sonic Link AST50	1.95
Sonic Link AST75	2.75
Sonic Link AST200	5.95
Sonic Link AST200x2	10.00
Sonic Link S300	18.00
Sonic Link S130x2	20.00
Sonic Link S300x2	35.00
Sonic Link S900	50.00
Sonic Link S600x2	70.00
Sonic Link RE3.1	90.00
Sonic Link RE3.4	330.00
Tech + Link SP9 79	1.20

Transparent Cable Musichord Spkr	11.00
Transparent Cable The Wave	23.00
Transparent Cable Music Wave Spkr	25.00
Vampire Wire SC-384	11.00
Vampire Wire SC-554	15.00
Vampire Wire ST-I	30.00
Vampire Wire SC-1108	30.00
Vampire Wire ST-II	48.00
Vampire Wire ST-III	73.00
Van Den Hul Skyline HB	3.50
Van Den Hul Snowline	5.00
Van Den Hul Skytrack HB	5.50
Van Den Hul Clearwater	7.00
Van Den Hul CS122 HB	12.00
Van Den Hul Cleartrack	13.00
Van Den Hul D352 HB	20.00
Van Den Hul Teatrack HB	22.00
Van Den Hul SCS12	34.00
Van Den Hul Magnum HB	38.00
Van Den Hul The Wind HB	40.00
Van Den Hul Revolution HB	76.00
Van Den Hul Revelation HB	120.00
Van Den Hul The Third	900.00
XLO Pro 625	4.00
XLO Pro 600	16.60

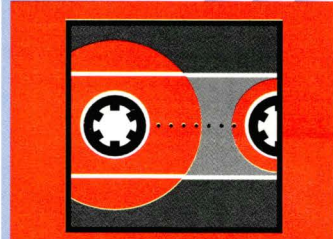


**KEY**  
**MM** - moving-magnet type.  
**MC** - moving-coil type.  
**Up to £100**

Audio Note IO1	MM	99
Audio Technica AT-91	MM	15
Audio Technica AT-95E	MM	20
Audio Technica AT-110E	MM	28
Audio Technica AT450E	MM	70
Audio Technica AT440ML	MM	90
Benz-Micro MC20EII	MC	70
Denon DL110	MC	70
Denon DL160	MC	90
Denon DL103	MC	100
Goldring Elan	MM	19
Goldring Elektra	MM	29
Goldring 1006	MM	59
Goldring 1012GX	MM	79
Goldring 1022GX	MM	99
Grado ZTE+1	MM	27
Grado ZCE+1	MM	37
Grado ZF3E+1	MM	48
Grado Prestige Black	MM	49
Grado Prestige Green	MM	59
Grado Prestige Blue	MM	69
Grado ZF1+	MM	83
Grado Prestige Red	MM	99
N'h'am Tracer I	MM	98
Ortofon VMS2	MM	14
Ortofon OM 5E	MM	20
Ortofon OM 10	MM	30
Ortofon 510	MM	38
Ortofon OM DJ	MM	50
Ortofon 520	MM	65
Ortofon OM 20	MM	70
Ortofon MC1 Turbo	MC	70
Ortofon Concorde DJ	MM	80
Ortofon OM 30	MM	90
Ortofon MC10 Super	MC	100
Ortofon 530	MM	100
Pickering TE-15	MM	20
Pickering VE-15	MM	25
Pickering T-E	MM	25
Pickering V15-DJ	MM	28
Pickering TL-E	MM	35
Pickering TL-2E	MM	45
Pickering XV15-625E	MM	50
Pickering XV15-150-DJ	MM	50
Pickering TL-2-S	MM	55
Pickering XV15-757S	MM	60
Pickering XV15-625DJ	MM	60
Pickering XV15-1800S	MM	70
Pickering TL3S	MM	80
Pickering XEV-3001E	MM	95
Pickering XLZ-3500	MM	100
Pickering TL-4-S	MM	100
Rega Bias	MM	39
Rega RB78	MM	39
Rega Super Bias	MM	59
Rega Elys	MM	85

Shure M70BX	MM	21
Shure M92E	MM	22
Shure SC35C	MM	29
Shure M447X	MM	35
Shure M44GX	MM	35
Stanton 500AL II	MM	35
Stanton 500EL	MM	44
Stanton 680AL/X	MM	59
Stanton 680EL/X	MM	74
Sumiko Oyster	MM	30
Sumiko Black Pearl	MM	50
Sumiko Pearl	MM	70
Sumiko Blue Point	MC	100
<b>Over £100</b>		
Audio Note IO2	MM	139
Audio Note Soara	MC	795
Audio Note IO1V	MC	1,095
Audio Note IO1LD	MC	4,500
Audio Technica AT-0C9	MC	330
Benz-Micro The Glider	MC	650
Benz-Micro M090	MC	700
Benz-Micro L040	MC	700
Benz-Micro H200	MC	700
Benz-Micro Reference	MC	1,100
Benz-Micro Reference Ruby	MC	1,500
Benz-Micro Ruby Open Air	MC	1,600
Clearaudio Aurum-Alpha	MM	135
Clearaudio Aurum-Beta	MM	195
Clearaudio Aurum-Beta/S	MM	265
Clearaudio Gamma-S	MM	745
Clearaudio Signature	MC	1,495
Clearaudio Accurate	MC	2,500
Clearaudio Insider	MC	4,900
Denon DL304	MC	200
Dynavector 10X4II	MC	189
Dynavector 23RS	MC	375
Dynavector 17D2	MC	450
Dynavector XX-1L	MC	998
Dynavector XX-1	MC	998
Dynavector Te-Kaitora	MC	1,698
Goldring Eroica LX	MC	110
Goldring Eroica	MC	110
Goldring 1042	MM	120
Goldring Elite	MC	220
Goldring Excel VX	MC	525
Grado Prestige Silver	MM	119
Grado Prestige Gold	MM	149
Grado Signature Junior	MM	150
Grado Signature 8MZ	MM	250
Grado Signature MCZ	MM	375
Grado Signature TLZ	MM	650
Grado Signature XTZ	MM	975
Grado Reference	MM	995
Koetsu Red T	MC	1,550
Koetsu Red K Sig	MC	1,998
Koetsu Urushi	MC	2,297
Koetsu Signature	MC	3,218
Koetsu Gold PR	MC	5,498
Linn K9	MM	125
Linn Klyde	MC	500
Linn Arkiv	MC	1,000
London Decca Maroon	MM	259
London Decca Gold	MM	299
London Decca Maroon Dp	MM	339
London Decca Gold Dp	MM	379
London Decca S Gold	MM	399
London Decca S Gold Dp	MM	479
London Decca Jubilee	MM	999
Lyra Lydian	MC	649
Lyra Clavis Da Capo	MC	995
Lyra Parnassus Dct	MC	1,895
N'h'am Tracer II	MM	310
N'h'am Tracer III	MM	410
N'h'am Tracer IV	MM	660
Ortofon MC3 Turbo	MC	130
Ortofon MC15 Super II	MC	130
Ortofon 540	MM	130
Ortofon MC25E	MC	180
Ortofon MC25FL	MC	250
Ortofon MC10 Supreme	MC	300
Ortofon SPU mono	MC	350
Ortofon MC20 Supreme	MC	425
Ortofon SPU Classic	MC	450
Ortofon MC30 Supreme	MC	525
Ortofon MC2000II	MC	750
Ortofon MC Rohmann	MC	1,000
Ortofon MC3000 II	MC	1,100
Ortofon MC5000	MC	1,500
Ortofon MC7500	MC	2,000
Pickering TL-3003	MM	145
Pickering XLZ-4500	MM	150
Pickering TL-4004	MM	175
Pickering XSV-5000U	MM	200
Pickering XLZ-7500	MM	200
Pickering TLZ-7500-S	MM	200
Reson Mica	MM	185
Reson Reca	MM	250
Reson Aciore	MM	299
Reson Etile	MC	455
Reson Lexe	MC	1,300
Roksan Corus Black	MM	130
Roksan Shiraz	MC	970

Shure V15XMR	MM	295
Stanton 890AL/X	MM	120
Sumiko BPS	MC	250
Transfiguration Spirit	MC	1,000
Transfiguration Temper	MC	1,950
Van Den Hul MM-1	MM	250
Van Den Hul MM-2	MM	300
Van Den Hul DDT-II	MC	600
Van Den Hul MC-10	MC	750
Van Den Hul MC-One	MC	900
Van Den Hul MC-ONE Super	MC	1,050
Van Den Hul MC-Two	MC	1,200
Van Den Hul The Frog Low o/p	MC	1,500
Van Den Hul Grasshopper IISLA	MC	2,000
Van Den Hul Grasshopper IIGLNL	MC	2,800
Van Den Hul Grasshopper IIGLNA	MC	2,800
Van Den Hul Grasshopper IICMNL	MC	2,800
Van Den Hul Grasshopper IICHLN	MC	2,900
Van Den Hul Grasshopper IIVGLA	MC	3,000
Wilson Benesch Matrix	MC	786
Wilson Benesch Carbon	MC	1,573
Wilson Benesch Analog	MC	1,850



**CASSETTE DECKS**  
**KEY**  
 ← → Autoreverse — no need to remove and turn round the tape.  
**3-H** - 3 heads, i.e. separate record and replay heads.  
**Up to £200**

Aiwa ADS750	MM	100
Aiwa AD-F460	MM	120
Aiwa AD-WX727	MM	170
Akai DXW1100	MM	200
Akai DX1200	MM	200
Ariston WX-510	MM	80
Denon DRM-550	MM	160
Denon DRW-580	MM	200
Denon DRS-640	MM	200
Goodmans Delta 801	MM	130
JVC TD-X372BK	MM	170
JVC TD-R472BK	MM	200
Kenwood KX-W4080	MM	160
Kenwood KX-3080	MM	160
Kenwood KX-W6080	MM	200
Kenwood KX-5080S	MM	200
Marantz SD-455	MM	169
Marantz SD-57	MM	199
Onkyo K 185	MM	150
Pioneer CT-S250	MM	200
Pioneer CT-W205R	MM	160
Pioneer CT-W505R	MM	180
Pioneer CT-S450S	MM	200
Pioneer CT-W606DR	MM	200
Sony TC-KE200	MM	120
Sony TC-WE405	MM	150
Sony TC-KE400S	MM	180
Sony TC-WE505	MM	180
TEAC W-416	MM	100
TEAC W-610	MM	100
TEAC W-780R	MM	170
TEAC R-560	MM	180
TEAC R-H500	MM	200
Technics RS-BX501	MM	170
Technics RS-TR373	MM	180
Technics RS-TR474	MM	200
Technics RS-A26	3-H	200
Yamaha KX-390	MM	150
Yamaha KX-W392	MM	180
Yamaha KX-490	MM	200

<b>Over £200</b>		
Aiwa AD-FR50	3-H	230
Aiwa AD-S950	3-H	300
Carver TDR-1550	MM	629
Denon DRM-650S	MM	230
Denon DRM-740	3-H	270
Denon DRS-810	3-H	310
H/K TD420	MM	250
H/K TD450	3-H	350
JVC TD-V662BK	3-H	270
JVC TD-W18BK	MM	300
NAD 613	MM	230
NAD 614	MM	270
NAD 616	MM	300
Onkyo TA 6210	MM	230
Onkyo TARW 211	MM	270
Onkyo TARW 311	MM	320

Onkyo TA 6310	330
Onkyo KR 609	350
Onkyo KW 606	370
Onkyo TARW 411	370
Onkyo K 611	460
Pioneer CT-S550S	250
Pioneer CT-W806DR	300
Pioneer CT-S550S Precision	340
Pioneer CT-S830S	500
Pioneer CT-95	1,000
Rotel RC960BX	250
Sony TC-WE805S	250
Sony TC-KAGES	550
T+A CC1200R	990
TEAC W-850R	250
TEAC V-1030	250
TEAC W-6000R	450
TEAC V-6030S	550
TEAC V-8030S	650
Technics RS-AZ7	270
Technics RS-TR575	280
Yamaha KX-580SE	250
Yamaha KX-W592	280
Yamaha KX-690	400



**CD PLAYERS**

**KEY**  
 ➡ - multiplayer: can be loaded with more than one disc.  
 10 - electrical (coaxial) digital output.  
 Many players also include an optical (Toslink) output.

**Up to £250**

Aiwa XC-300	150
Akai CD1100	180
Akai CDM1200	230
AMC CD9	120
AMC CD8A	150
AMC CD6	250
AMC CDM7	250
Ariston CDX700	60
Ariston CDX710	100
Ariston CDX910	120
Ariston CDC610	140
Cambridge CD4	150
Cambridge CD45E	200
Cambridge CD6	250
Denon DCD-635	180
Denon DCD-625	200
Denon DCD-715	235
Denon DCD-825	240
H/K HD710	200
JVC XL-V120BK	110
JVC XL-V130BK	120
JVC XL-V230BK	140
JVC XL-F116BK	180
JVC XL-F216BK	200
JVC XL-Z574BK	250
Kenwood DP-1080	110
Kenwood DP-2080	130
Kenwood DP-R3090	140
Kenwood DP-R4090	160
Kenwood DP-3080	170
Kenwood DP-R6090	200
Kenwood DP-4090	250
Marantz CD-38	130
Marantz CC-38	200
Marantz CD-48	200
Marantz CD-57	230
Marantz CD-67II	250
NAD S10	200
NAD S12	250
Philips CD711	120
Philips CD721	130
Philips CD751	150
Philips CDC751	180
Pioneer PD-106	130
Pioneer PD-206	150
Pioneer PD-F606	200
Pioneer PD-M603	200
Pioneer PD-S505	200
Pioneer PD-F706	250
Rotel RCD-930AX	180
Rotel RCD950	250
Sansui CD220	100
Sherwood CD-4030R	180
Sherwood CDC680	180
Sherwood CDC6050R	180

Sony CDP-M205	110
Sony CDP-XE210	120
Sony CDP-M305	130
Sony CDP-XE310	140
Sony CDP-CE105	150
Sony CDP-XE510	180
Sony CDP-CE315	200
Sony CDP-C325M	200
Synergy CDJ1210	120
TEAC CD-P1800	130
TEAC CD-P3450SE	200
TEAC PD-H500	240
TEAC PD-D2200	250
Technics SL-PG380A	100
Technics SL-PG480A	130
Technics SL-PG580A	150
Technics SL-PD687	160
Technics SL-PD887	180
Technics SL-PS670D	200
Technics SL-PS770D	250
Yamaha CDX-390	130
Yamaha CDC-565	170
Yamaha CDX-490	170
Yamaha CDC-665	220
Yamaha CDX-590	230

**£251 to £500**

Aiwa DX-C100M	500
Arcam Alpha 7	330
Arcam Alpha MCD	450
Aura CD100	400
Carver MV-5	469
Denon DCM-260	300
Denon DCD-1550AR	350
Denon DCD-1015	350
H/K HD730	300
H/K FL8300	300
JVC XL-Z674BK	300
Kenwood DP-R7080	300
Kenwood DP-9090	300
Kenwood DP-7090	400
Marantz CD-67SE	350
Marantz CC-870	400
Marantz CD-63HW	400
Musical Fidelity E60	300
Musical Fidelity A2 CD	500
NAD 513	290
NAD 515	350
NAD 514	370
NAD 517	400
Onkyo DX 7210	260
Onkyo C721	290
Onkyo DXC 320	380
Onkyo DX 7510	400
Onkyo CM 716	450
Pioneer PD-F805	300
Pioneer PD-S705	300
Pioneer PD-F906	350
Pioneer PD-S904	400
Pioneer PD-S505 Precision	460
Sony CDP-CX55	280
Sony CDP-XE900E	300
Sony CDP-CX200	380
Sony CDP-XA20ES	450
Sony CDP-X3000ES	500
TEAC CD-5	350
Technics SL-MC410	300
Yamaha CDX-890	350

**£501 to £1000**

Acurus ACD11	899
Alchemist Nexus	597
Arcam Alpha 8	520
Arcam Alpha 8SE	600
Audiolab 8000CD	1,000
AWI S2000MC2	899
Creek CD42	599
Denon DCD-3000	1,000
DPA Renaissance int CD	950
Fase Evoluzione Laserdrive 1.0	995
Helios Model 3	650
Helios Model 2	950
Keybrook Signature II	989
Linn Mimik	875
Magnum CD2020	595
Marantz CD-17	800
Micromega Stage 4	600
Micromega Stage 5	750
Micromega Stage 6	950
Mission dAD3	598
Mission dAD3Q	898
Monrio Privilege	995
Myrrad MC100	700
Naim CD3	1,000
Orelle CD100eA	649
Orelle CD-100eSA	999
Pioneer PDS-06	550
Primare D20	800
Quad 77 Bus	700
Quad 77 Mains	900
Roksan Caspian	895
Synergy CDJ1220	600
T+A CD1200R	895
TEAC VRDS-7	599

TEAC VRDS-9	700
TEAC VRDS-10SE	850
Technics SL-P2000	1,000
Trichord Genesis	549
Trichord Digital Jukebox 25	599
Trichord Digital Jukebox 50	649
Trichord Digital J'box 100	699
Trichord Revelation	799
YBA Special	625

**Over £1000**

Acoustic Precision Eikos	1,850
Alchemist Forseti	1,950
Audio Research CD1	3,290
Audio Research CD2	4,100
Audiomeca Talisman	2,150
Audiomeca Talisman SE	2,300
AWI S2000MC	1,399
Cary CD-301	2,495
Conrad-Johnson DF-2	1,695
Conrad-Johnson DV-2b	2,495
Copland CDA-266	1,199
Copland CD277	1,950
Copland CDA288	2,199
Cymbal CDP12	1,299
Helios Model 1	1,250
Helios Stargate	2,250
Krell KPS30i	5,490
Krell KPS-20i	9,990
Marantz CD-17KIS	1,100
Mark Levinson 39	4,995
Meracus Tanto	1,395
Meracus Imago Player	4,495
Meridian 506	1,100
Meridian 508	1,995
Micromega Solo	2,750
Myrrad MCD500	1,300
Naim CD2	2,000
Naim CDX	2,200
Naim CDS	3,940
Oracle CD Player	7,300
Pink Triangle Numeral	1,049
Pink Triangle Litaural	2,200
Primare 302	1,800
Roksan Atessa-DP3P	1,495
Sherwood CD1	1,100
Sonic Frontiers Anthem CD1	1,595
Sonic Frontiers SFCD-1	3,495
TEAC VRDS-25	1,300
Theta Digital Miles	2,495
XTC CDP-1	1,250
YBA Integre	1,250
YBA CD3	2,250
YBA CD2	3,350
YBA CD1	4,500
Altis CDT III	4,995



**CD TRANSPORTS**

**KEY**  
 10 - electrical (coaxial) digital output.  
 Many players also include an optical (Toslink) output.

Arcam Delta 250	800
Audio Research CDTI	3,290
Audio Synthesis Transcend Decade	2,995
Audiolab 8000CDM	1,400
Audiomeca Damnation	999
Audiomeca Damnation SE	1,100
Audiomeca Talisman	1,850
Audiomeca Talisman SE	1,999
Audiomeca Talisman DOB	2,250
Audiomeca Mephisto	2,350
Audiomeca Mephisto SE	2,500
Audiomeca Mephisto	2,750
Cambridge Discmagic One	300
Conrad-Johnson DR-1	1,795
DPA Enlightenment Drv	725
Jadis JD3	4,850
Jadis JD2	4,990
Jadis JDI	12,500
Krell KPS-20t	8,490
Linn Karik	1,850
Mark Levinson 37	3,995
Mark Levinson 31.5	3,995
Meracus Imago	3,995
Meridian 500	1,245
Micromega Drive 3	750

Micromega Data	2,250
Monrio Bitmatch	950
Muse Model 5	1,800
Oracle CD Drive	4,680
Pink Triangle Cardinal II	909
PS Audio Lambda TR	2,250
PS Audio Lambda AT&T	2,778
Rogers SC-8t	2,699
Roksan Atessa-DP3	1,295
Sonic Frontiers SFT-1	2,295
Sonic Frontiers Transport 3	5,995
T+A CM1200R	990
TEAC VRDS-T1	550
TEAC P-30	2,500
Theta Digital Data Basic II	2,397
Theta Digital Data III NTSC/PAL	5,455
Thorens TCD-2000	999
Trichord Digital Turntable	699
Tube Tech Fulcrum	1,000
Wadia 8	3,195
Wadia 20	4,370



**DIGITAL TO ANALOGUE CONVERTERS (DACs)**

**KEY**  
 4 - number of digital inputs

Altis Reference	4,995
AMC CDM7DAC	100
AMC DAC8	130
AMC CDM7VAC	200
Apogee Digital DA-1000	3,395
Arcam Black Box 50	350
Arcam Black Box 500	500
Audio Note DAC1	675
Audio Note DAC2	1,099
Audio Note DAC3	1,750
Audio Research DAC5	2,148
Audio Research DAC5	2,335
Audio Research DAC3	4,195
Audio Research DAC3	4,555
Audio Synthesis DAX Decade	2,795
Audiolab 8000DAX	1,900
Audiomeca Elixir	799
Audiomeca Ambrosia	1,850
Boulder 2020	17,750
Cambridge Dacmagic 2 Mk II	150
Chord DSC1100	2,575
Chord DSC1500	3,850
Conrad-Johnson D/A-3	1,195
Conrad-Johnson D/A-2b	1,990
Denon DCD-425	150
DPA Little Bit 3	325
DPA Renaissance DAC	570
DPA Enlightenment DAC	825
DPA SX128	2,000
DPA SX256	4,000
DPA SX512	8,000
Jadis JS3	2,129
Jadis JS1	8,068
LFD DAC2	1,950
LFD DAC3	3,000
Linn Numerik	3,500
Manley Professional DAC-20	6,950
Mark Levinson 36	3,995
Mark Levinson 30.5	15,950
Meracus Auriga	1,295
Meracus Flagrare	2,495
Meridian 566	1,095
Micromega DAC 2	750
Micromega Dialog	2,000
Monrio 18B2	795
Muse Model 2	2,190
Muse Model 2 Plus	2,500
Musical Fidelity X-ACT	200
Musical Fidelity X-DAC	300
Onkyo DX 7310	330
PS Audio DL3	777
PS Audio SL3	1,449
PS Audio UltraLink 2 HDCD	2,590
PS Audio Ref Link	4,550
Rogers SC-8m	1,899
Roksan Atessa-DA2	595
Sonic Frontiers SFD-2 Mk 2	5,295
Sonic Frontiers Processor 3	6,995
Sumo Theorem II	945
Sumo Theorem IIB	1,155
Talk Electronics Thunder 3	1,000
TEAC D-TI	500



Sennheiser HD545 Reference.

TEAC D-700	600
Theta Digital Chroma Std	849
Theta Digital Pro Geny	1,145
Theta Digital Pro Prime II	1,800
Theta Digital Pro Basic III	2,990
Theta Digital Gen V SE	4,300
Theta Digital Casablanca LS	5,910
Thorens TDA-2000	700
Trichord Pulsar Ser One	1,395
Tube Tech Fulcrum	1,400
Wadia 12	1,530
Wadia 15	3,790
Wadia 64.4	4,750
Wadia 16	7,395
Wadia 7	9,995
Wadia 9	12,790
Woodside DVAC-18	1,499



HEADPHONES

**KEY**  
 'D' - dynamic type, compatible with virtually all normal headphone sockets.  
 'E' - electrostatic type; generally includes a separate power supply.  
 ☞ - open-back construction.  
 ☝ - closed-back construction.

**Up to £40**

Aiwa HP-X301	D	☝	20
Aiwa HP-VX303	D	☝	25
Aiwa HP-X705	D	☝	40
AKG Rox	D	☝	30
Aural Envelope DX200	D	☝	20
Aural Envelope DX220	D	☝	30
Beyer DT111	D	☝	15
Beyer DT211	D	☝	31
Beyer DT211TV	D	☝	35
JVC HA-CD88	D	☝	18
JVC HA-D525	D	☝	20
JVC HA-F65	D	☝	20
JVC HA-D626	D	☝	25
Kenwood KPM-310	D	☝	18
Kenwood KPM-410	D	☝	25
KLH KHP201TW	D	☝	21
KLH KHP-300V	D	☝	25
KLH KHP-420V	D	☝	33
Maxell HP-2000	D	☝	20
Pioneer SE-A40	D	☝	20
Pioneer SE-A20V	D	☝	23
Pioneer SE-M250	D	☝	25
Pioneer SE-M350	D	☝	30
Sennheiser HD56	D	☝	18
Sennheiser HD433	D	☝	20
Sennheiser HD400	D	☝	25
Sennheiser HD470	D	☝	35
Sennheiser HD60TV	D	☝	40
Sony MDR-W20G	D	☝	18
Sony MDR-E837	D	☝	18
Sony MDR-P70	D	☝	18
Sony MDR-ED238	D	☝	20
Sony MDR-009TV	D	☝	20
Sony MDR-A34L	D	☝	20
Sony MDR-E848	D	☝	20



DIGITAL RECORDERS

**KEY**  
 MD - MiniDisc  
 DAT - Digital Audio Tape  
 ☞ - portable

Denon DMD-1300	MD	500
Kenwood DM-7090	MD	500
Onkyo MD 122	MD	700
Philips CDR870	MD	499
Pioneer PDR-04	MD	700
Pioneer D-05	DAT	900
Pioneer PDR-05	DAT	1,000
Pioneer D-C88	DAT	2,000
Sharp MD-R1E	MD	300
Sharp MD-MS200H	MD	350
Sharp MDX300H	MD	1,000
Sony MZ-E20	MD	180
Sony MDS-JE510	MD	250
Sony MZ-E30	MD	280
Sony MDS-S38	MD	300
Sony MZ-R30	MD	300
Sony MDS-JA30ES	MD	699
TEAC MD-H500	MD	650
TEAC MD-10	MD	950
Kenwood KPM-310	D	18
Kenwood KPM-410	D	25
KLH KHP201TW	D	21
KLH KHP-300V	D	25
KLH KHP-420V	D	33
Maxell HP-2000	D	20
Pioneer SE-A40	D	20
Pioneer SE-A20V	D	23
Pioneer SE-M250	D	25
Pioneer SE-M350	D	30
Sennheiser HD56	D	18
Sennheiser HD433	D	20
Sennheiser HD400	D	25
Sennheiser HD470	D	35
Sennheiser HD60TV	D	40
Sony MDR-W20G	D	18
Sony MDR-E837	D	18
Sony MDR-P70	D	18
Sony MDR-ED238	D	20
Sony MDR-009TV	D	20
Sony MDR-A34L	D	20
Sony MDR-E848	D	20

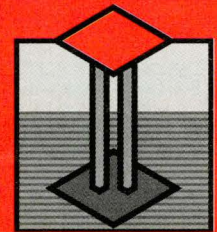
Sony MDR-P1TV	D	☝	25
Sony MDR-CD270	D	☝	30
Sony MDR-E868	D	☝	35
Sony MDR-V400	D	☝	40
Sony MDR-D11	D	☝	40
Stanton ST Pro	D	☝	25
Technics RP-F200	D	☝	30
Technics RP-HT300	D	☝	40
Vivanco SR150	D	☝	20
Vivanco SR200	D	☝	25
Vivanco SR250	D	☝	25
Vivanco SR300	D	☝	30
Vivanco IR5700	D	☝	40

Over £41

AKG K301	D	☝	80
AKG K2221R	D	☝	100
AKG K401	D	☝	120
AKG K501	D	☝	150
AKG K3331R	D	☝	150
AKG K4441R	D	☝	180
AKG K290S	D	☝	250
AKG K1000	D	☝	700
Audio Technica ATH910PRO	D	☝	80
Audio Technica ATH40FS	D	☝	120
Audio Technica ATHM40FS	D	☝	120
Audio Technica ATH911	D	☝	120
Beyer DT311	D	☝	50
Beyer DT411	D	☝	63
Beyer DT511	D	☝	106
Beyer DT801	D	☝	125
Beyer DT811	D	☝	145
Beyer DT100	D	☝	160
Beyer DT901	D	☝	160
Beyer DT911	D	☝	170
Denon AH-D210	D	☝	45
Denon AH-D350	D	☝	65
Denon AH-D550	D	☝	80
Denon AH-D650	D	☝	95
Denon AH-D750	D	☝	130
Denon AH-D950	D	☝	150
Grado SR40	D	☝	45
Grado SR60	D	☝	79
Grado SR80	D	☝	100
Grado SR125	D	☝	150
Grado SR225	D	☝	200
Grado SR325	D	☝	300
Grado RS2	D	☝	495
Grado RS1	D	☝	695
Jacklin Float Model 1	D	☝	79
Jacklin Float Model 2	D	☝	99
Jacklin Float ELS	E	☝	399
JVC HA-D727	D	☝	43
JVC HA-W60	D	☝	49
JVC HA-D910	D	☝	65
JVC HA-D1000	D	☝	250
JVC HA-F25	D	☝	699
Philips SBC 3396	D	☝	70
Philips SBC HP9000	D	☝	90
Pioneer SE-M550	D	☝	50
Pioneer SE-M750	D	☝	60
Pracida Ergo Model 1	D	☝	120
Pracida Ergo Model 2	D	☝	140
Sennheiser IS 380	D	☝	55
Sennheiser HD455	D	☝	55
Sennheiser HD465	D	☝	65
Sennheiser HD570	D	☝	80
Sennheiser HD475	D	☝	90
Sennheiser HD25 SP	D	☝	80
Sennheiser IS450	D	☝	110
Sennheiser HD545 Ref	D	☝	125
Sennheiser HD265 Linear	D	☝	125
Sennheiser HD250H	D	☝	150
Sennheiser HDC 451-1	D	☝	150
Sennheiser HD565 Ovat'n	D	☝	150
Sennheiser HD25-13	D	☝	160
Sennheiser HD25	D	☝	160
Sennheiser HD 580 P'cision	D	☝	200
Sennheiser HD600	D	☝	250
Sennheiser Lucas	D	☝	280
Sennheiser IS850	D	☝	859
Sennheiser HE60/HEV70	E	☝	998
Sennheiser Orpheus	E	☝	9,652
Sony MDR-IF120K	D	☝	50
Sony MDR-E888	D	☝	55
Sony MDR-IF125RK	D	☝	60
Sony MDR-V600	D	☝	70
Sony MDR-F1	D	☝	100
Sony MDR-NC5	D	☝	100
Sony MDR-IF420RK	D	☝	100
Sony MDR-CD770	D	☝	100
Sony MDR-D77	D	☝	130
Sony MDR-IF520RK	D	☝	150
Sony MDR-CD1700	D	☝	200
Stanton DJ Pro 101/HB	D	☝	65
Stanton DJ Pro 1000	D	☝	95
Stanton DJ Pro 1001	D	☝	150
Stax SR-0001	E	☝	280
Stax SR-Lambda Nova C	E	☝	370
Stax SR-Lambda Nova S	E	☝	450
Technics RP-F800	D	☝	50
Technics RP-HT600	D	☝	60

Technics RP-DJ1200	D	☝	130
Vivanco IR5800	D	☝	50
Vivanco SR850	D	☝	50
Vivanco SR650	D	☝	50
Vivanco FMH 3000	D	☝	60
Vivanco SR750	D	☝	60
Vivanco IR6000	D	☝	70
Vivanco SR909	D	☝	70
Vivanco IR7600	D	☝	100
Vivanco SR1000IFL	D	☝	100
Vivanco SR2000IFL	D	☝	120

EQUIPMENT SUPPORTS



SPEAKER STANDS

KEY

60 - height of stand in cm

Alphason NCI	60	47
Alphason Akros I	60	49
Alphason RS1	120	49
Alphason Akros II	60	59
Alphason NCH	60	84
Alphason HDS-40/M	60	85
Alphason Titan S	60	125
Apollo AZ6	66	80
Arcici Q-1	30	299
Arcici Q-2	30	299
Atacama BD21	56	55
Atacama BD17	55	55
Atacama BD25	60	60
Atacama SE16	65	65
Atacama SE12	65	65
Atacama SX500	67	67
Atacama F2	70	70
Atacama F1	70	70
Atacama SX600	70	70
Atacama SL200	70	70
Atacama SE24	61	70
Atacama SE20	70	70
Atacama SX700	73	73
Atacama SL300	73	73
Atacama TP600	75	75
Atacama TP500	75	75
Atacama SE615	75	75
Atacama SE515	75	75
Atacama SE415	75	75
Atacama SL400	76	76
Atacama SE1000S	80	80
AVF Tower P6144BP	60	35
BCD Model 1010	60	495
Credo STD 001		284
Custom Design CD 500	50	35
Custom Design AS 130	25	35
Custom Design AS 630AV	65	40
Custom Design Tri 100	50	50
Custom Design R/S 200	50	50
Custom Design R/S300	60	70
Custom Design Tri 300	55	85
Custom Design SCS 24	60	85
Custom Design X24	61	109
Custom Design C 20	50	109
Custom Design H1	50	275
Deadrock 903	60	60
Deadrock 902	47	60
Deadrock 901	39	60
Dynaudio Trophy	60	120
Dynaudio Master	60	200
Dynaudio Ultra	60	290
Harbeth HL-Stands	21	249
Heybrook Stand-ULT	3	55
Heybrook Stand-S6	63	69
Heybrook Stand-S4	48	69
Heybrook Stand-S1	47	119
JPW MS2	45	45
JPW MS3	61	55
JPW MS1	46	80
JPW HS1	58	120
JPW HS2	45	120
Kudos Audio Arrow	60	50
Kudos Audio S-50	60	100
Kudos Audio S-100	63	270
Mission Micrometer	58	70
Mission Entasis	58	98
Opera S1	60	345
Pioneer CP-7	50	50
Pioneer CP-8	80	80
Projekt Signature	55	80
Revolver RS1	50	70

Royd Royd	55	99	Impulse Iso-plate	190
SD Acoustics SD Alexandra	50	369	JPW 3 Tier	3
Silverado Silverado 1 Stand	60	350	JPW 5 Tier	5
Sonus Faber Ironwood		475	Kudos Audio Corinthian	5
Sonus Faber Stonewood		497	Linn K3000	85
Sound Org Z037		55	<b>Mana Sound Frame</b>	125
Sound Org Z027		55	Mana Mini Table	150
Sound Org Z026		55	Mana Power supply table	150
Sound Org Z518	45	65	Mana Reference flat top	150
Soundstyle X6118	42	100	Mana Sound Shelf	175
Stands Unique Speaker support	59	159	Mana Sound Base	175
<b>Stands Unique Tuned Spkr Support</b>	59	220	Mana Sound Stage	200
Stands Unique Tuned Carbon Fibre	59	299	Mana Sound Table	235
<b>Stands Unique Vivas CF Spkr Supp</b>	60	349	Mana Ref Shelf	325
Target TR60	60	68	<b>Mana Reference Table</b>	350
Target R1	53	280	Mana 2 Tier Amp stand	375
			Mana 3 Tier Amp Stand	450
			Mana 4 Tier Amp Stand	500
			<b>Mana 5 Tier Amp Stand</b>	600
			Mana 6 Tier Amp Stand	700
			Mission Hark	298
			Optimum G2	69
			Optimum G2/Pedestal	99
			Optimum G4/Pedestal	130
			Optimum OPT 3406	149
			Optimum G5/Pedestal	150
			Optimum OPT 4906	199
			Optimum OPT 6606	249
			Optimum OPT 340	249
			<b>Optimum OPT 490</b>	299
			Optimum OPT 440	299
			Optimum OPT 10206	299
			Optimum AV 300	329
			Optimum OPT 700	349
			Optimum OPT 610	349
			Optimum OPT 660	349
			Optimum OPT 1020	399
			Optimum OPT 1190	450
			Projekt A3	145
			Projekt A4	190
			Projekt A5	235
			Projekt B3	255
			Projekt A6	280
			Projekt B3i	300
			Projekt B4	340
			Projekt B Multi	345
			Projekt B3ii	345
			Projekt C3	375
			Projekt D3	420
			Projekt C3i	420
			Projekt B5	425
			Projekt C3iii	465
			Projekt C3ii	465

EQUIPMENT SUPPORTS

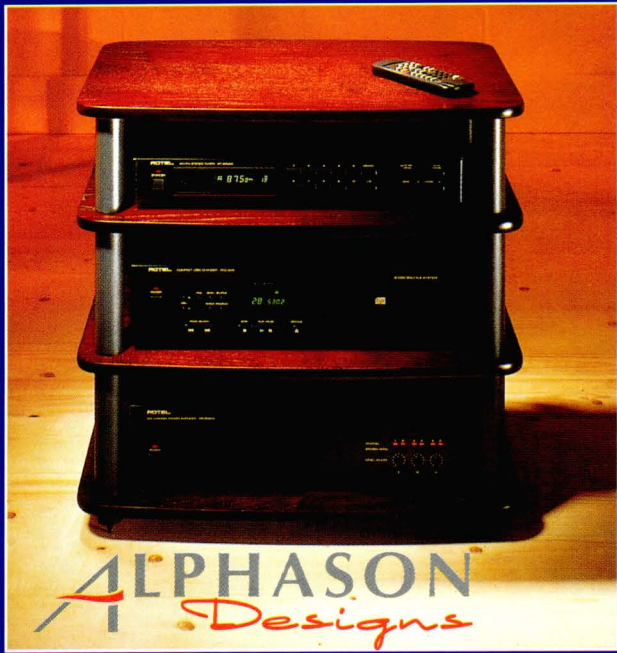
KEY

3 - number of shelves

Alphason SM17	1	49	Projekt A4	190
Alphason VSM17	1	85	Projekt A5	235
Alphason GSM17	1	85	Projekt B3	255
Alphason GMV1P	1	110	Projekt A6	280
Alphason R17/17	3	120	Projekt B3i	300
Alphason GMH1P	1	150	Projekt B4	340
Alphason GR17/17	3	150	Projekt B Multi	345
Alphason VR17/17	3	190	Projekt B3ii	345
Audiophile Base 01	1	79	Projekt C3	375
Audiophile S4120	4	280	Projekt D3	420
Audiophile S4T120P	4	560	Projekt C3i	420
BCD Model 1006/8	1	795	Projekt B5	425
BCD Model 1000	3	1,250	Projekt C3iii	465
Custom Design G3	3	130	Projekt C3ii	465
Custom Design Aspect 650	4	240		
Custom Design Aspect 500AV	3	270		
Custom Design Aspect 850	5	270		
Deadrock 701	1	60		
Deadrock 802	2	90		
Deadrock 703	3	130		
Deadrock 704	4	190		
Deadrock 705	5	230		
<b>Fi-Rax R4</b>	6	399		
Frameworks H175	1	130		
Frameworks FS1		150		
Frameworks FT2		285		
Frameworks FT3		350		
Frameworks H700		355		
Frameworks H900		389		
<b>Frameworks H500/H175</b>	3	404		
Heybrook Stand-Signature	4	249		

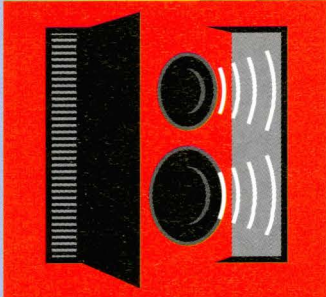
Projekt D3i	12	500	Ariston MSX 05	80
Projekt C4	12	500	Celestion 12i	119
Projekt C3iv	10	510	Denon SC-M2	80
Projekt D3ii	14	545	Gale Mini Monitors	70
Projekt C Multi	9	555	Gale Gold Monitors	90
Projekt D4	16	560	Genexa GX300	80
Quadraspire Q4S mini shelf	1	60	Genexa GX330	80
Quadraspire Q4S shelf	1	60	GLL Arena	90
Quadraspire QKS Cabinet shelf	1	80	Goodmans Active 75	65
Quadraspire QAV shelf	1	120	Interaudio XL1000	130
Quadraspire Q4M mini table	4	200	Jamo Studio-80	70
<b>Quadraspire Q4 table</b>	4	200	Jamo SAT-90	90
Quadraspire QAV table	3	300	Jamo Cornet 25	100
Quadraspire Q4SP Table	4	320	Jamo D-110	100
Quadraspire QAVSP Table	4	400	Jamo SAT-170	110
Quadraspire QK Cabinet	4	400	Jamo Studio-110	110
Reson DOMOPS	1	195	Jamo Cornet 35	120
Reson DOMOWS	1	195	Jamo Artina	120
Sound Org Z022	1	65	Jamo D-115	120
Sound Org Z021	2	78	Jamo 28	125
Sound Org Z030	3	100	JBL TLX111	120
Sound Org Z060	4	120	<b>JPW Mini Monitor</b>	60
<b>Sound Org Z038</b>	5	135	JPW ML110	70
Sound Org Z540	4	140	<b>JPW Gold Monitor</b>	80
Sound Org Z545	4	140	JPW ML210	80
<b>Sound Org Z560</b>	5	160	JPW ML310	90
Sound Org Z530	3	170	JPW ML410	100
Soundstyle X300	3	180	<b>JPW ML510</b>	130
Soundstyle X305	3	210	JVC SX-SC1VBK	60
Soundstyle X053	4	210	JVC SP-V50	80
Soundstyle X050	4	210	JVC SP-X220TBK	100
Soundstyle X6300	3	215	<b>JVC SP-X550BK</b>	130
Soundstyle X100	4	220	<b>KEF Coda 7</b>	129
Soundstyle X6110	4	230	Kenwood LS-90UK	130
Soundstyle X058	5	240	<b>Mission 731i</b>	130
Soundstyle X310	3	250	Mordaunt-Short VS-100	100
Soundstyle X105	5	250	<b>Mordaunt-Short MS05i</b>	100
Soundstyle X6053	4	255	NAD 801	100
Soundstyle X6100	4	265	Paradigm Micro	100
Soundstyle X6310	3	275	Paradigm Atom	130
Soundstyle X6058	5	290	Pioneer CS-3030	120
<b>Soundstyle X6105</b>	5	300	Polk AB410	100
<b>Soundstyle Finewoods W105</b>	5	320	Realistic Minimus 26	56
Stands Unique Isolation Platform	1	52	Realistic Minimus Pro-77	100
Stands Unique Sound Support	4	249	<b>Revolver Beretta</b>	100
<b>Stands Unique Sound Tower</b>	5	289	R Allen Minette 2	129
Stands Unique Compact Sound Supp	4	315	Solid HCM2	130
Stands Unique Sound Support 10	4	315	Sony SS-86E	100
Stands Unique Sound Twr Cabinet	5	369	Tangent Monitor 3	60
Stands Unique Ref Wall Support	1	550	<b>Tangent Monitor 5</b>	80
Stands Unique Ultimate Tower	10	689	Tangent Monitor 7	100
Stands Unique Ref Floor Support	6	799	Tannoy Mercury M1	120
<b>Target B5</b>	5	175	TDL Nucleus 1	75
Townshend Seismic Sink 1-C0	110		TDL Nucleus 2	130
Townshend Seismic Sink 1-3D	400		TEAC LS-X8 Mk II	80
Townshend S/Sink Stand 1-4	999		Technics SB-CS55	80
Townshend Seismic Sink 3-4	4	1,250	Technics SB-CS65	100
Wilson Benesch Standard Shelf	1	130	Technics SB-CS75	100
Wilson Benesch Mono Block	1	265	Visonik 5202	129
Wilson Benesch Kevlar Shelf	1	270	W'dale Valdus 100	80
Wilson Benesch Asside Basic	1	590	W'dale Diamond 7.1	100
Wilson Benesch Asside	4	720	W'dale Valdus 200	110
Wilson Benesch Triptych	1	990	W'dale Modus Micro	110

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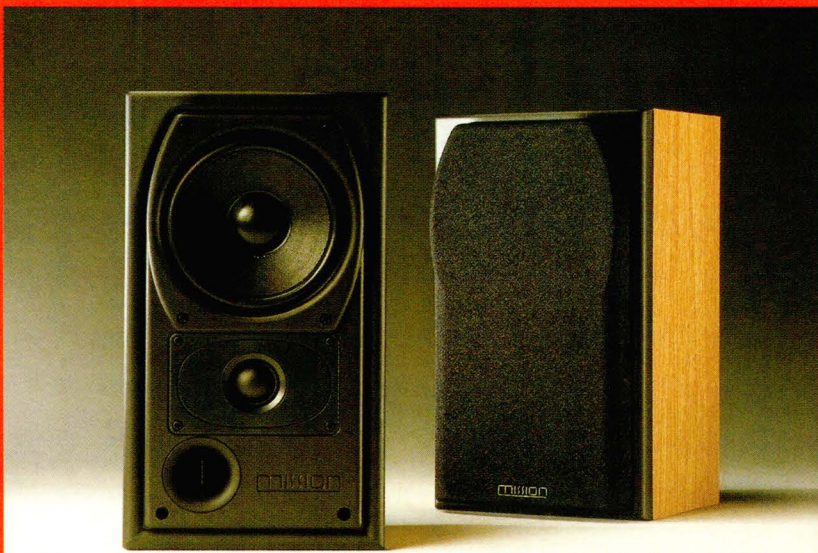


**KEY**  
 ⚡ - floorstander; larger models requiring no separate stand.  
 📦 - stand mount; smaller models designed to be raised above the floor.  
 📌 - wall mount; designed to be hung on the wall or mounted in-wall.  
 📦 - box type, including infinite baffle, reflex and transmission line types.  
 📌 - horn type; mostly large and very efficient.  
 📦 - panel type, including electrostatic and planar magnetic types.

Up to £130  
 Allison Micro Monitors 95  
 Allison Mini References 120

<b>£131 to £200</b>	
Acoustic Energy AE100	200
Allison Model 4A	170
<b>B&amp;W DM302</b>	150
B&W CWM5	170
<b>B&amp;W DM601</b>	199
Bose 101	190
Bose 141	200
Boston CR6	149
Boston 325	149
Boston Micro 80 Sat	169
Boston Runabout	169
Boston 335	179
Boston 351	189
Boston CR7	199
Boston Runabout II	200
Celestion 15i	199
<b>Cerwin-Vega CT-165</b>	200
Denon SC-E313	160
Gale 2i	140
Gale 4i	140
Gale 3i	150
Genexa GX650	140
GLL Imagio IC100	170
<b>Heybrook Prima</b>	159
Infinity SM65	150
<b>Infinity Reference 1i</b>	150
Infinity Reference 1ii	200
Interaudio XL2000	200
Jamo 38	150
Jamo 525	150
Jamo 560	150
Jamo 660	170
Jamo Cornet 65	170
Jamo Studio 180	180
Jamo D165	200
Jamo 68	200
JBL TLX121	150
JPW ML610	170

JPW SS551	200	Boston Voyager	299	R Allen Dimension Five 2	269	GLL Imagio IC130	500
KEF Coda 8	189	Castle Isis	250	Rogers db101	250	Heybrook Heylios	389
KEF Q15	199	Celestion 23i	299	Rogers GS3	279	Heybrook Heylo	439
KEF Model 60S	199	Cerwin-Vega VS-8	250	Royd The Envoy	249	Infinity SM105	350
Kenwood LS-200G	200	Cerwin-Vega CT-330	300	Royd Minstrel	275	Infinity SM115	400
KLH Model 21	155	Chario Syntar 100	250	Ruark Epilogue	239	Infinity SM125	500
KLH Model 11	155	Dali 102B	260	Sequence 300	249	Jamo Classic 6	330
KLH Model 31	185	Dali 150	300	Solid HCM1	250	Jamo Cornet 75	330
Mission 731i Pro	140	Faraday FS1	245	Sony SS-176EB	250	Jamo BX-100A	350
Mission 732i	200	Gale 5i	220	Tannoy Mercury M3	230	Jamo 98	350
Mordaunt-Short MS10i Pearl	150	GLL Imagio IC110	260	Tannoy Precision P10	300	Jamo 407A	350
Mordaunt-Short VS-200	150	GLL Imagio IC115	300	Visonik 7003	203	Jamo D365	400
Mordaunt-Short MS20i Pearl	200	Heybrook Optima	259	Visonik SUB5	259	Jamo Cornet 95	400
Mordaunt-Short VS-300	200	Heybrook Heylette	269	W'dale Modus Music Four	230	Jamo Classic 8	400
Paradigm Titan	150	Heybrook HB1	269	W'dale MFM1	250	Jamo Graphic	400
Pioneer CS-5030	170	Infinity SM85	250	W'dale Valduis 500	300	Jamo 128	450
Polk M2	180	Interaudio XL3000	230	Yamaha NS10M	300	Jamo BX-150A	450
Polk RT3	200	Interaudio XL4000	295	ZYP A1T	219	Jamo Atmosphere	480
Polk AB610	200	Jamo 892	220	ZYP A2S	275	Jamo 477A	500
Rega KYTE	198	Jamo Classic 4	250	ZYP A2ST	295	JBL LX6	350
Revolver Colt	139	Jamo Art	270			JBL TLX161	400
Revolver The 230	169	Jamo D265	300			JBL PS8	500
Revolver Purdey MkII	199	Jamo 307A	300			JBL TLX171	500
R Allen Minette 3	159	JBL LX2	250	Acoustic Energy AE109	350	JM Lab Micron	395
R Allen Dim'n 5/1 Compact	179	JBL TLX151	300	Acoustic Energy AE209	450	JM Lab Megane	495
R Allen RA6	199	JPW ML710	300	Acoustic Energy AE120	500	Jordan Watts JHFLG	380
Rogers GS1	179	JPW ML810	260	Allison Model 2A	420	JPW SS553	400
Royd A7X	155	JPW ML910	300	AVI Neutron	499	JPW ML1010	400
Sequence 200	199	JVC SX-SW10	300	B&O Beovox CX50	325	JPW Ruby 1	400
Solid Monitor	200	KEF Coda 9	299	B&O Beovox CX100	425	JPW Ruby 2	500
Sony SS-126EB	150	KEF Model 70S	299	B&W CWM8i	350	KEF Q35	349
Sony SS-176E	200	KLH 83A	205	B&W DM305	350	KEF Q55	499
Tangent Monitor 9	150	KLH 183A	265	B&W DS6	400	KEF RDM One	499
Tangent Monitor 11	180	KLH Soundbites System	276	B&W CDM2	400	Keswick Aria II	379
Tannoy Mercury M2	140	KLH Model 81	280	B&W DM603	500	KLH 283A	310
TDL Nucleus 3	200	KLH Model 41	290	B&W Signature 7	352	KLH 383A	335
Technics SB-CS95	150	M-A Monitor 1	250	Bandor Pictures	400	KLH Model 51	375
Technics SB-M20	200	M-A Monitor 2	300	Blue Room Mini Pod	380	KLH Model 71	420
Visonik 6003	143	Mordaunt-Short MS30i	275	Bose 301	380	KLH Model 62T	486
Visonik 5001	170	Mordaunt-Short MS10i Classic	280	Bose 171	386	Linn Sekrit	395
W'dale Diamond 7.2	140	Mus Tec Kestrel SE	300	Bose Amass AM3 II	500	Mission 733i	330
W'dale Valduis 300	150	NAD 802	280	Boston Micro 90 Sat	369	Mission 751f	348
W'dale Modus Music Two	200	NHT SuperZero	218	Boston VR20	380	Mission 734i	499
W'dale Valduis 400	200	Paradigm Mini Monitor	220	Castle Tay	350	M-A Monitor 3	400
W'dale Diamond 7.3	200	Pioneer CS-7030	230	Castle Kendal	450	M-A Monitor 4	500
ZYP A1	199	Pioneer CS-9030	280	Castle Eden	470	Mordaunt-Short MS25i Pearl	500
		Pioneer S-LC1	300	Castle Edin	399	Mordaunt-Short MS40i	450
		Polk AB505	220	Celestion 25i	449	Mus Tec Harrier	400
		Polk M3 II	220	Celestion 30i	499	NAD 804	400
		Polk RT5	250	Celestion 35i	395	Neat Critique	385
		Polk M5	300	Cerwin-Vega VS-10	370	NHT SuperOne	338
		Promenade SP1	299	Clements 300si	400	NHT Model 1.5	450
		Rega EL8	298	Dali 104B	500	Opera Duoetto	395
		Revolver The 250	250	Dali 606	395	Origin Live QL-1AS	399
		R Allen Dimension Five 1	239	Dali Royal	499	Origin Live Monarch	399
		R Allen RA8	249	Def Tech Celsius	345	Paradigm Monitor 7	330
		R Allen RA8M	249	Epos ES12	445	Paradigm Monitor 9	400
				Faraday SG	400	Pentachord A	469
				Faraday Siren		Pioneer S-LC2	450
				GLL Imagio IC120		Polk AB705	330
						Polk RT8	400
						Polk RT10	500
						Polk AB805	500
						Prof Monitor Co TB1S	366
						Prof Monitor Co TB1SM	403
						Prof Monitor Co TB1	410
						Prof Monitor Co TB1M	447
						Prof Monitor Co XB1	499
						Promenade SP2	399
						Promenade SP3	499
						Rega ELA MkII	498
						Revolver The 260	350
						R Allen Dimension Five 3	349
						R Allen Dimension Five 4	429
						Rogers GS5	379
						Rogers GS6	429
						Rogers GS8	479
						Rogers C6/20	499
						Royd The Squire	350
						Royd Minstrel SE	399
						Royd Doublet	485
						Ruark Icon	359
						Sequence 400	329
						Solid Verticale	400
						Spendor S2	399
						Spendor 2020	399
						Spendor S1	499
						Tannoy Precision P20	400
						TDL RTL2 SE	330
						TDL RTL 3SE	450
						TDL Chiltern CF100	450
						Technics SB-M300	350
						Technics SB-M500	450
						Totem Mite	495
						Triangle Titus TZe	379
						Triangle Lunn	500
						Visonik TB1S	366
						W'dale Modus Music Six	330
						W'dale MFM3	350
						W'dale Modus Music Eight	430
						W'dale MFM5	450
						W'dale Modus Music 1/6	500



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Acoustic Precision Eikos FR1	800
Allison Model 3A	525
Audio Gem Emerald	540
Audio Note AN-K/D	620
Audio Note AN-J/B	799
B&O Beolab 2500	750
B&W CDM1	600
B&W P4	675
Bose 501	700
Bose SE-5 Ser II System	760
Bose A'mass AM5 II	800
Boston VR30	600
Castle Severn 2	580
Castle Avon	730
Celestion 45i	599
Cerwin-Vega VS-12	550
Cerwin-Vega VS-15	700
Chario Syntar 100T	550
Clements 600si	595
Dali 107	600
Dali 350	600
Dali 450	700
Dali 109	800
Def Tech BP6B	750
Diapason Micra II	695
Dynaudio Audience 50	577
Epos ES14	675
Faraday FS10	795
Harbeth BBC LS3/5A	699
Harbeth HL-P3ES	799
Heybrook Ultima	649
Heybrook Quartet	649
Infinity SM155	550
Jamo BX-200A	530
Jamo Classic 10	600
Jamo 507A	700
Jamo 707i	800
JBL LX7	550
JBL TLX181	600
JBL SVA1500	700
JBL L20	700
JBL PS12	750
JM Lab Profil 55	625
JM Lab Opal 59 ti	750
Jordan Watts JH200	510
Jordan Watts JH400	565
JPW Ruby 3	800
KEF LS3/5a	649
KEF RDM Two	699
KEF Q65	799
Kelly KT2	700
Keswick Volante	729

KLH Model 82Ta	690
Linn Tukan Passive	550
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Manticore Minaret	690
Meridian A500	750
M&K S-85	700
Mission 752i	578
Mission 735i	650
Mission 733i	798
M-A Studio 2SE	600
M-A 700 PMC	600
M-A 702PMC	700
M-A 703PMC	800
Mordaunt-Short MS50i	550
Mordaunt-Short MS30i Classic	600
Mus Tec Falcon	575
Naim Intro	660
Neat Mystique	575
Neat Petite II	745
Opera Seconda	595
Opera Operetta II	770
Opera Platea	795
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Origin Live Victory	750
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Pentachord Pentode	729
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Polk RT16	799
Polk LS50	800
Proac Tablette 50	599
Proac Studio 100	699
Promenade SP4	650
Quad 10L	600
Rogers GS9	579
Rogers LS3/5A	699
Rogers C6/25	799
Roksan ROKone 1	595
Roksan Ojan 3	795
Royd The Sorcerer	595
Royd Abbot	695
Ruark Templar II	599
Ruark Sceptre	599
Ruark Talisman II	749
Ruark Prologue One	799
SD Acoustics SD3R	649
Shinpy Polarys	595
Silverado Raider	695
Sonus Faber Concertino	599
Spendor 2030	599
Spendor LS3/5A	630
Spendor SP3/1P	795
T+A TB 100	690
Tannoy Precision P30	600

Tannoy Definition D100	689
Tannoy Precision P40	800
TDL Cotswold CF200	650
TDL RTL 4	650
TDL T-Line 3	700
Totem Rokk	695
Triangle Comete Tze	525
Triangle Zephyr	799
Wdate MFM7	650

**£801 to £1500**

Acoustic Energy AE505	850
Acoustic Energy AE509	1,000
Acoustic Energy AE2-II	1,095
Acoustic Energy AE520	1,200
Acoustic Solutions Eight	1,200
Alon I Mk II	1,500
Ambience Mod. 4.0	1,185
Apertura Prima	1,095
Apertura Nova	1,395
ATC SCM10	999
Audio Note AN-I/D	930
Audio Note AN-K/SPx	1,060
Audio Note AN-E/B	1,299
Audio Note AN-I/SPx	1,415
Audio Physic Step	1,299
AVI Positron	899
B&O Beolab 4000	1,100
B&W P5	875
B&W CDM7	1,000
B&W DM604	1,000
B&W P6	1,095
B&W Matrix 805 V	1,095
Bandor Trident	846
Bandor Mora	1,260
Bandor Bandora	1,340
Bose A'mass AM7	900
Bose 701	1,000
Boston VR40	1,000
Castle Harlech	880
Castle Howard S2	1,200
Celestion A1	899
Celestion A2	1,499
Cerwin-Vega AL-1000	1,100
Cerwin-Vega 1515	1,300
Chario Academy 1	1,300
Clements Reference 1	995
Dali 850	1,100
Def Tech BP8B	1,000
Def Tech BP10B	1,500
Diapason Prelude II	875
Dynaudio Contour 1.1	879
Dynaudio Contour 1.3	1,198
Electrocompaniet EC-Qube	1,195

Electrocompaniet EC-Qube SE	1,495
Epos ES22	1,185
Harbeth HL-K6	1,049
Harbeth HL-Compact 7	1,499
Harbeth BBC LS5/12A	1,499
Heybrook Sextet	1,299
Impulse Kora	1,250
Jamo Concert 8	1,300
JBL L40	1,000
JBL PS15	1,000
JBL L80	1,250
JBL L90	1,500
JM Lab Profil 77	1,050
JM Lab PS 5.1	1,250
JM Lab Spectral 909.1	1,375
Jordan Watts JH1 +1	995
JPW Ruby 4	1,000
KEF Q75	999
KEF Ref. Model One	1,199
Kelly KT3	1,200
Keswick Torino	999
Keswick Figaro Evolution	1,099
Keswick Milano	1,199
Keswick Legato	1,199
Keswick Amber	1,499
Linn Tukan Aktiv	1,050
Linn Keilidh Aktiv	1,250
L Voice Auditorium	1,500
Lowther Accolade 2	1,199
Lumley L/M3.5	1,050
Magneplanar SMG-C SE	990
Magneplanar MG-0.6 SE	1,370
Meridian Argent 1	995
M&K S-125	1,150
Mission 754f	1,298
M-A Studio 12	1,000
M-A 705PMC	1,400
Mordaunt-Short Perf 820	1,495
Mus Tec Condor	1,000
Mus Tec Hawk	1,250
Mus Tec Eagle	1,500
Naim Credo	1,060
NHT VT-1.2	999
NHT Model 2.5	1,299
Opera Callas II	950
Opera Terza	999
Opera Callas Gold	1,050
Opera Divina II	1,500
Origin Live Sovereign	975
Paradigm Studio/100	950
Polk LS70	1,200
Polk RT20p	1,500
Proac Tablette 50 SIG	899
Proac Response 1 SC	1,199
Proac Studio 150	1,399
Prof Monitor Co LB1	935
Prof Monitor Co AB1	1,496
Rega XEL	1,040
RMS Revelation S 1	1,299
Rogers C6/28	1,399
Roksan Ojan 3X	995
Royd The Albion	985
Ruark Broadsword II	899
Ruark Paladin	1,099
Shahinian Super Elf	875
Shahinian Compass	1,395
Shinpy Microphonica	1,099
Silverado Ryder	1,395
Sonus Faber Minuetto	898
Sonus Faber Concerto	1,098
Spendor 2040	899
Spendor SP2/3E	1,050
Spendor SP1/2E	1,390
T+A TAS 1200E	990
T+A TB 120	990
Tannoy Definition D300	999
TDL Cheviot CF300	850
Technics SB-M1000	1,500
Totem Model One	1,195
Triangle Antal	1,099
Vandersteen 2Ce	1,395
Visonik LB1	935

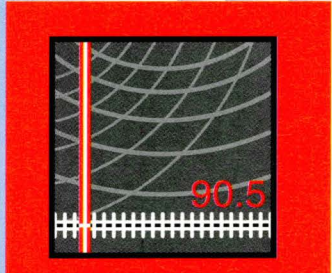
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Acoustic Energy AE1 Sig	1,695
Acoustic Energy AE2 Sig	2,695
Alon II Mk II	2,300
Ambience Mod 3.2	1,780
Apertura Agora Signature	2,295
Apertura Tanagra	2,395
Apertura Tanagra Sig.	2,795
ATC SCM20	1,599
ATC SCM20 Tower	2,099
Audio Note AN-E/D	1,520
Audio Note AN-E/SPx	2,250
Audio Physic Spark 2	1,749
Audio Physic Tempo	1,999
Avalon Monitor	2,995
B&O Beolab 6000	1,550
B&O Beolab 8000	2,100
B&O Beolab Penta 3	2,650
B&W Matrix 804	1,695



REL Storm	695
REL Stadium II	995
REL Stentor II	1,800
REL Studio II	4,000
Revel Sub-15	2,195
Revolver The Recoil	100
R Allen Gold Sub	149
R Allen Dim'n Active	499
R Allen Magnum Active	699
Rogers AB1	549
Rogers Sub-bass	679
Roksan Ojan 3S	795
Sequence FW120	249
Solid PB100	350
Sony SA-W101	230
Sunfire True Sub	1,450
TDL Nucleus SBR	200
Triangle Sat III	650
Velodyne VA-68XII	399
Velodyne VA-810XII	599
Velodyne VA-1012XII	699
Velodyne VA-1215XII	999
Velodyne FSR-12	1,099
Velodyne FSR-15	1,299
Velodyne F-1800II	1,999
W'dale Modus Sub Bass	180
W'dale Modus Powered Sub	350
Wilson Audio Puppy 5.1	8,450
Wilson Audio Whow III	12,500
Yamaha YST-SW40	140
Yamaha YST-SW80	180
Yamaha YST-SW150	280
Yamaha YST-SW300	350

<b>SME Series V</b>	1,461
Wheaton Music Tri-Planar 4i	3,000
Wheaton Music Tri-Planar 5i	3,250
Wilson Benesch Act 0.5	795
Wilson Benesch ACT2	1,350
Zeta AS	469
Zeta VDH	549



**TUNERS**

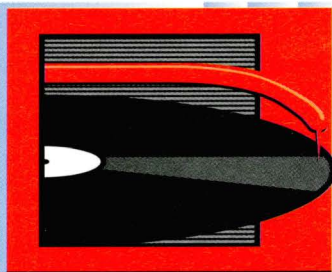
**KEY**

'P20' - (etc.) number of presets.  
**RDS** - Radio Data System; receives text information on station, programme type etc.

Akai AT1200	170
AMC T7	130
Arcam Alpha 7	230
Arcam Alpha 8	280
Arcam Delta 280	200
Ariston TX-510	60
Audiolab 8000T	800
Aura TU80	350
AVI S2000MT	P16 599
AVI S2000MT2	P99 469
Carver TX-8R	P20 399
Creek T43	P68 5,937
Day Sequerra FM Ref	14,640
Day Sequerra S B'dcast Mon	
Denon TU-260L	P20 120
Denon TU-215RD	P40 150
Denon TU-425RD	P40 200
H/K TU930	P30 150
H/K TU950	P30 200
Kenwood KT-2080	P20 130
Kenwood KT-3080	P30 175
Linn Kudos	P50 775
Linn Kremlin	P80 2,600
Magnum Dynalab FT11	550
Magnum Dynalab FT-101A	825
Magnum Dynalab Etude	1,250
Magnum Dynalab 108	4,500
Marantz ST-48	P30 119
Marantz ST-17	P60 600
Meridian 504	P30 695
Michi RHT-10	P16 895
Micromega Minium FM Mk2	P39 329
Micromega Tuner	P39 750
Mission Cyrus FM7	P29 400
Musical Fidelity E50	P20 300
NAD 412	P24 250
NAD 414RDS	P24 190
NAD 710	P24 270
NAD 712	P24 370
Naim NAT03	P50 595
Naim NAT02	1,080
Naim NAT01	1,730
Onkyo T 4210RDS	P30 180
Onkyo T 409	P30 230
Onkyo T 411RDS	P30 260
Pioneer F-204RDS	P30 140
Pioneer F-504RDS	P40 250
Pioneer F-504RDS Precision	P40 300
Quad 77FM	P25 700
Rega Radio	P24 229
Roksan Caspian	P50 595
Rotel RT-935AX	P20 160
Rotel RT940AX	P20 200
Sansui AUX-310	P20 80
Sony ST-SE200	P30 100
Sony ST-SE300	P30 120
Sony ST-SE500	P30 140
Sony ST-SE700	P30 180
Sony ST-SA3ES	P30 250
T+A T1200R	RDS 745
TEAC T-R400	RDS 120
TEAC T-H500	RDS 170
TEAC TB-X10	RDS 400
Technics ST-GT350L	P30 130
Technics ST-GT550L	P39 180
Technics ST-GT650L	P39 230
Thorens TRT-2000	P59 499
Yamaha TX-480L	P40 100
Yamaha TX-492RDS	P40 130
Yamaha TX-590RDS	P40 180



Acoustic Precision Eikos CD player — £1,800 worth of digital dreadnought.



**TURNTABLES**

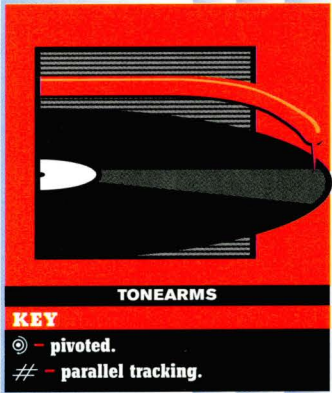
**KEY**

arm included.  
 cartridge included.

Up to £500

Audio Note AN-TT 1	349
Dual CS435-1	150
Dual CS455	190
Dual 505-4 UK	250
Eclipse TT430	70
Genexxa Lab-710	60
Genexxa Lab-810	70
Kenwood KD-492F	100
Michell Mycro	455
Moth Alamo	199
Moth Kanoot Mk1 Arm	279
Moth Kanoot Mk3 Arm	329
NAD 533	220
N'ham Interspace	500
Pioneer PL-J2500-C	80
Pioneer PL-990	130
Pro-Ject 0.5/OM10	160
Pro-Ject 1/510	200
Pro-Ject 2/520	300
Pro-Ject 6/MC15	450
Rega Planar 78	214
Rega Planar 2	214
Rega Planar 3	274
Roksan Radius	470
Sherwood PM8550	130
Sony PS-LX150H	90
Sony PS-LX300H	150
Systemdek I/920	136
Systemdek IIX/900	230
Systemdek I/920/Moth	235
Systemdek IIXE/900Ap	388
Systemdek 960	500
Systemdek 2X2	500
Technics SL-J110D	120
Technics SL-BD20	160
Technics SL-BD22	180
Technics SL-1210MkII	400
Technics SL-1200MkII	400
Thorens TD-180 AT91	190
Thorens TD-280 IV/UK	210
Thorens TD-166 VI/UK/RB	400
Thorens TD-318 III TP50	500
<b>Over £500</b>	
Audio Note AN-TT 2	995
Audio Note AN-TT 3	1,995
Audiomeca Romance	1,895
Audiomeca J1	3,500
Basis 2001	2,750
Basis Ovation II	4,800
Basis Debut Gold Std III	7,200
Basis Debut Gold Vacuum	9,250
Chantry QT Level 2	705
Clearaudio Evolution	1,790
Clearaudio Reference	3,990
DNM-Reson Rota 1	3,900
DNM-Reson Rota 2	5,600
Impulse Moskito	695
Kuzma Stabi	1,950
Kuzma Stabi Reference	3,750
Linn LP12 Basic	1,100
Linn LP12 Lingo	1,750
Manticore Mantra 97	595
Manticore Mantra	895

Manticore Magister	4,400
Michell Gyrodek	875
Michell Orbe	1,995
N'ham Spacedeck	750
N'ham Graphic	1,200
N'ham HyperSpacedeck	1,500
N'ham Mentor	2,600
N'ham Anna Log	5,500
Oracle Paris	1,100
Oracle Delphi	3,370
Oracle Delphi 15th Anniv	3,800
Pink Triangle Tarantella	680
Pro-Ject 6/Sumiko	850
Rega Planar 9	1,598
Reson RS1M	600
Rota 1	3,900
Rockport Capella II	7,000
Rockport Sirius III	50,000
Roksan Xerxes 10	1,295
Roksan TMS	2,750
SME Model 20/2	3,403
SME Model 20/2A	4,863
SME Model 30/2	10,675
SME Model 30/2A	12,135
Stratosphere ST1	6,500
Technics SL-1200LTD	700
Thorens TD-146 VI TP50	550
Thorens TD-2001 TP90	700
Thorens TD-520 SME	1,050
Well Tempered Record Player	1,850
Well Tempered Classic	2,980
Well Tempered Super	3,900
Well Tempered Reference	5,300
Wilson Benesch Circle	795
Wilson Benesch WB Turntable	1,775
Wilson Benesch Full Circle	1,995



**KEY**

⊙ - pivoted.  
 # - parallel tracking.

Air Tangent IC	# 3,333
Air Tangent 10B	# 7,777
Air Tangent Ref. Sig.	# 11,000
Audio Note AN-ARM 1	169
Audio Note AN-0s	795
Audio Note AN-1s	995
Audiomeca SL5	2,500
Clearaudio TQ-1 Improved	# 1,950
Dynavector 507	1,995
Graham 1.5 Basic	1,695
Graham Mk 2.0	2,650
Helius Orion 4 Copper	549
Helius Cyalene 2	1,495
Kuzma Stogi	750
Kuzma Stogi Ref	1,250
Linn Akito	500
Linn Ekos	1,500
Manticore Musician II	595
Manticore Magician II	895
Manticore Magician 12	995
Moth Mk I	109
Moth MkIII Stainless	146
Moth Mk III Tungsten	174
Moth Moth 900	598
Naim ARO	1,040
N'ham Space	450
N'ham Paragon 3	550
N'ham Paragon 2	800
N'ham Mentor	800
N'ham Foot	1,100
N'ham Paragon 1	1,600
Rega RB250	109
Rega RB300	174
Rega RB900	598
Rockport Series 7000	# 6,000
Roksan Tabriz	370
Roksan Tabriz Zi	420
Roksan Artemiz	895
SME 3009 Ser II Imp	309
SME 3009 S2 Ser II Imp	338
SME Series II 3009-R	514
SME Series II 3010-R	526
SME Series II 3012-R	565
SME 309	689
SME 310	705
SME 312	802
SME Series IV	983

**Remember that all entries printed in RED refer to hi-fi products that we have reviewed. Turn to page 114 for a full summary of test results!**





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<b>BRADFORD</b> Cleartone, Rawson Square, City Centre (Formerly Ericks) TEL: 01274 309266	<b>BOLTON</b> Cleartone, Blackburn Road, City Centre (On the A666 Blackburn Road) TEL: 01204	<b>BIRMINGHAM</b> Empire Superstore 21-22 Stephenson Street (Behind New St. Opp. Pellicodas Car Park) TEL: 0121 643 0972

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- ▶ BLACKPOOL: 81 Whitegate Drive - 01253 300599
- ▶ LANCASTER: 84 Penny Street - 01524 39657

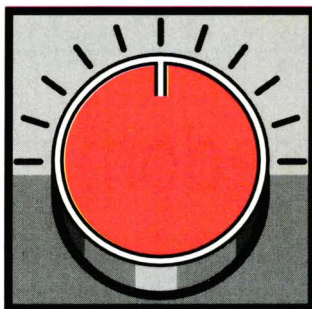
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Single speaker dem room. We do not use any comparators. We also have full demonstration of projection tv with laserdisc and full prologic systems. Part exchange welcome please phone or e-mail for prices. We have in stock over 200 laserdiscs call for our latest catalogue.



# Amplifiers Brought to you in association with **audio research** HIGH DEFINITION™

The amplifier sits at the heart of the system, processing the outputs from 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, but are separated in preamps and power amplifiers. Even separate power supplies become increasingly common as one moves upmarket. Bear in mind that output power and sound quality are not necessarily related. Some of the finest amplifiers available have outputs as low as

12 Watts, but team them with high-efficiency loudspeakers and you can achieve loudness aplenty. Please note: monoblok power amps are those in which the left and right channels are handled by physically separate units.

B

Best buy

R

Recommended

KEY	MC PHONO INPUT:	POWER OUTPUT (W):	copy of the review. Use the contents page to find the Factsback information page elsewhere in this section.
LINE INPUTS: Number of input sockets for non-vinyl sources such as CD players, tuners and cassette decks.	If an amp has an input for moving coil (low output) phono pickup cartridges.	Lab-tested power output in Watts per channel.	
MM PHONO INPUT: If an amp has an input for moving magnet (normal output) phono pickup cartridges.	REMOTE CONTROL: If an amp is couch-potato ready.	RECEIVER: If an amp has a built-in radio tuner.	ISSUE NUMBER: The issue of Hi-Fi Choice in which the original review appeared.
	HEADPHONE SOCKET: If an amp is can friendly.	FACTSBACK NUMBER: The Factsback reference for ordering a fax	

## INTEGRATED AMPLIFIERS

Product	Price(£)	Comments	LINE INPUTS	MM PHONO INPUT	MC PHONO INPUT	HEADPHONE SOCKET	REMOTE CONTROL	POWER OUTPUT(W)	RECEIVER	FACTSBACK NUMBER	ISSUE NUMBER
Alchemist Maxim	319	Vivid and colourful-sounding amp that's just too bold and brassy	5	●				30		1737	154
Alchemist Kraken APD6A	579	Compact, with Darth Vader styling, yet sound quality is surprisingly meek and mild, despite strong midband dynamics	5	●				55			175
Alchemist Nemesis	700	Good if ultimately undistinguished amplifier whose strengths include warmth, authority and distinctive aesthetics	6					80			168
AMC 3025a	140	Surprisingly potent and easy on the ear, if not especially analytica — classic bargain basement material in fact	4	●	●	●	●	30			171
AMC 3050a	170	Tremendous value for money, and a full, big, if rather uninformative sound	4	●	●	●	●	45			167
AMC CVT3030a	400	Beer-budget valve amp, with quintessentially valve-like virtues (euphony with dynamics) and vices (system dependency, noise)	6	●		●		30			168
Arcam Alpha 7	260	Decent, if slightly system-fussy amplifier that generally pulls all the right strings	5	●			●	40			167
Arcam Alpha 8	360	Enjoyably soft-centred amp, won't frighten the animals. Upgradeable via preamp output, and optional remote control	5	●			●	50		1853	162
Arcam Alpha 9	500	Not quite a match for the Alpha 9/9P combo, the solo integrated is nevertheless colourful and explicitly detailed	7			●	●	70			168
Audio Analogue Puccini	450	Superbly finished, the entry-level Audio Analogue performs way out of its class	5	●	●			40			175
Audiogram MB1	493	The only flaws are the amateurish build, a number of technical problems and inconsistent sound quality. Other than that...	4	●		●	●	40			178
Audio Note Oto SE	1,200	Transparent, dynamic, clear and subtle, but offers limited power output	4					24			126
Audiolab 8000LX	470	Well built, minimalist entry level model ultimately lacks bottle and pizzazz	6				●	60			175
Audiolab 8000A	500	The 8000A remains a highly disciplined and mature-sounding amp	5	●	●		●	60		1581	140
Audiolab 8000S	700	Informative in every sense, only a slight lack of bite detracts. Perhaps Audiolab's best yet!	6			●	●	60		1740	154
AVI S2000MI	999	Fine, detailed amplifier with excellent timing and strong control of a wide range of loudspeaker loads	5			●		100			175
Bryston B60R	1,249	Build quality can't be faulted, but the lazy bass and opaque treble bracket an articulate midband. Comes with 20 year guarantee	5			●	●	60			175
Cambridge Audio A3i	200	"Maximum information" design, with plenty of usable and reasonably refined power. A snip!	4	●				60			167
Copland CSA8	945	Sophisticated yet transparent, this is one of those amplifiers that sounds good even when the gloss has worn off	5					60			168
Copland CSA14	1,199	Great sound and looks, but watch out for high capacitance speaker cables	4	●				60		1416	148
Credo IMP702	850	Old-fashioned looking, but bags of clarity and precision, though it can sound brash in the wrong system	5					70			175
Cymbal CA1	499	Lacklustre amplifier tends to underperform with complex material. Best with straightforward compact loudspeakers	6					40			178
Creek 4330	279	Compact, even pretty, but sounds dark and uninviting, with coarse treble and woomy bass	5					40			171
Denon PMA-250SE	160	This amp can sound rough when extended, but within its limits it is open, detailed and likeable	5				●	30			171
Denon PMA-350SE	200	Reinvented in the minimalist tradition, this SE model is a control freak, but can sound wonderful	5				●	50		1856	162
Denon PMA-425R	230	Well-equipped and generally enjoyable but slightly ragged performer	3	●			●	45			167
Denon PMA-725R	350	Warm, bold, up-front presentation, but musically unexciting	5	●	●	●	●	97		1802	157
Densen Beat B-100 MkII	650	High 'air guitar' factor, and can punch above its weight, but check to ensure it will complement the rest of your system	5					60			175
DPA Renaissance	595	DPA's first integrated amp is typically innovative, but a little too 'crisp 'n dry' for our tastes	5	●			●	40		1582	140
EMF Audio Sequel	450	Relaxed and restrained design from Mike Creek	5	●			●	50			109
Exposure XX Super	700	Rather transistorised, unexciting sound. Good coherence and rhythm. Best played loud	6					55		1743	154
Electrocompaniet EC1-2	995	A 50 watt amplifier which sounds more powerful, and makes real sounding music in real sounding acoustic spaces	4					50			175
Gamma Acoustics Gemini	699	Genuine single-ended triode design, but low power, mundane sound and poor build	3					12		1416	148
Goodmans Delta 900A	130	Coloured and raw sound offsets high power yield and remarkable pricing, but noisy fan cooling is a joy-killer	5	●		●	●	100			178
Harman/Kardon HK610	180	Lively and friendly sound, but could prove too exciting for the faint hearted	6	●			●	30		1465	149
Harman/Kardon HK620	250	Capable and musical amplifier which is among the nicest available at the price. Optional add-in MM/MC board available	6	●			●	40		1858	162
JoLida 202	695	Well-built and technically accomplished, affordable valve integrated with subtle and refined, if not quite gripping sonic performance	4					40			168
JVC AX-V4	200	Respectable performance for a Pro-Logic AV amplifier. Lacks resolution and sparkle, though	5	●		●	●	63		1805	157
JVC AX-R5	200	Versatile, and lots of even-handed, articulate detail; but let down by superficiality	5	●		●	●	45		1466	149
Kenwood KA-3020SE	200	Not a brilliant phono stage, but this is a lively, exuberant-sounding amp via CD	5	●		●	●	50		1130	134
Kenwood KA-5090R	300	Large, well equipped and high tech integrated, but TRAITR output still gives a harsh, unsubtle performance	5	●	●	●	●	65			171
LFD Integrated Zero	549	Lively and brisk, but at the same time cold and unsympathetic	6					50		1584	140
Linn Majik (phono)	800	The cornerstone of Linn's modular hi-fi system is innovative, but sounds vague and confused	5	●	●		●	33		1013	129
Magnum IA120	265	Mirror finish amplifier with a bold, colourful delivery, but needs careful system matching to avoid loss of focus and clarity	6				●	65			171
Magnum IA170	330	Gives a realistic sense of instruments playing within a very believable acoustic, preserves colour and dynamics well	6				●	96		1260	142
Magnum IA-200	599	Sweet, valve-flavoured solid state amplifier flatters where it doesn't cast light	7					160		1860	162
Magnum Class A	690	Lashings of rich and compelling music, but the Class A circuits trade lushness for accuracy	4	●	●			60			116
Magnum Class A SE	795	A MOSFET amplifier drawing inspiration from the world of valves, this is an erratically refined, detailed amplifier	5	●				80			175
Marantz PM-57	200	Well equipped but ultimately anodyne amplifier which lacks for nothing but star quality	5	●		●	●	50			171
Marantz PM-66SE	230	A bit lush, and power output is limited, but it communicates well and gives airy, large-scale music. An excellent budget buy	5	●		●	●	50			167
Marantz PM66 KI-Signature	400	An amplifier that knows how to rock and roll with holographic detail and stereo, but prefers small/medium scale acoustic material	5	●		●	●	50			168
Mission Cyrus IIIi	598	Beautifully presented, but mid-dominated balance and other anomalies were not liked. Upgradeable using PSX PSU unit	6	●		●		50		1854	162
Mission Cyrus SL	398	Sharp, articulate amplifier, and superb, outgoing midband with lean though well-extended bass — and build quality to die for	6					50			168
Monrio ASTY	400	Engaging, but ill-disciplined, even OTT amplifier that responds less than predictably to system changes	5					55			178
Musical Fidelity E11	299	Well built minimalist amp with a 5 year guarantee, but can sound congested when extended, and some colorations are evident	6					60			178

# INTEGRATED AMPLIFIERS

ISSUE NUMBER  
FACTSBACK NUMBER  
RECEIVER  
POWER OUTPUT (W)  
HEADPHONE SOCKET  
REMOTE CONTROL  
MM/MC PHONO INPUT  
LINE INPUTS

Product	Price(£)	Comments	5	4	3	2	1	0	RECEIVER	POWER OUTPUT (W)	HEADPHONE SOCKET	REMOTE CONTROL	MM/MC PHONO INPUT	LINE INPUTS	ISSUE NUMBER	FACTSBACK NUMBER
▲ Musical Fidelity A2	500	Lucid, transparent midband and a full upper bass are provided by this highly proficient A1 replacement	5	●						25					1862	162
▲ Musical Fidelity A220	700	Powerful, authoritative and well turned-out amplifier that is easy to match with comparably priced speakers and source components.	5	●						50						168
▲ Musical Fidelity E1	199	Vivid, richly flavoured tonality and realistically scaled imagery distinguish this new entry-level Richer Sounds special	6							30						171
▲ Myryad M1120	600	Well styled, well built and, well, a good, even tempered amplifier, though it can sound a bit brittle, and lacking in euphony	6					●	●	60						175
▲ NAD 310	100	Fleet and sure of foot, it seems likely to set all appendages tapping with its blend of enthusiasm and artfulness	5							20					1468	149
▲ NAD 312	200	Another great budget price NAD, and a worthy all-round successor to the 302	6	●				●	●	25						171
▲ NAD 314	260	Lively if coloured presentation that is musically engaging and easy on the ear	6	●						53					1807	157
▲ Naim Nait 3	575	Distinctive and highly musical sounding integrated amp. Perhaps too distinctive for some tastes	5							30					1748	154
▲ Orelle SA-100	499	A musically rewarding amplifier that grows on you. Trace of coarseness in treble	5							50					1749	154
▲ Orelle SA-100RX	649	Fine, high resolution amplifier, but avoid very low impedance speakers, and check CD compatibility by ear	7							75						178
▲ Pioneer A-204R	160	The A-204R makes no special claims beyond being well equipped and cheap, but it displayed unexpected talent on test	5	●						25						171
▲ Pioneer A-300R	200	Its bright and breezy sound is a natural tonic to those of us worn down by the ongoing stress of life	5	●						50					1469	149
▲ Pioneer A-405R	250	Fully featured, open and dynamic sounding, more than makes up in enthusiasm what it occasionally lacks in refinement	5	●						45						178
▲ Pioneer A-400X	300	On second audition, this amp was tonally unchanged but less compelling	6	●	●					50					1545	138
▲ Pioneer A-300R Precision	400	Sophisticated, breathed-on variant of the A-300R. Not an obvious winner, but will slowly win you over with its subtle charms	5	●				●	●	35					1863	162
Pioneer A-605R	400	Intriguing technology, but execution is certainly impeded by excessive gadget count	5					●	●	80						168
Pioneer A-07	999	Curious mix of high end attributes and inconsistent, though undeniably detailed sound	5	●					●	80						175
Pro-ject Model 7	300	A minimalist amplifier brimming with good intent, but too quirky for its own good. Either MM or MC	5	●						40					1264	142
▲ Quad 77 Integrated	700	Compact and sophisticated Quad system amp, limited range of inputs when used with 'foreign' components (optional system remote)	3							84						168
Rega Elex	398	Minimalist amplifier, derived from Elicit, is a little uninspiring, though at least it is well behaved	4	●						50					1865	162
▲ Roksan Caspian	695	Well-built, open and articulate amplifier, which is also consistent from system to system, and well built	6						●	70						168
Rose Scion	615	Unique two-box integrated gives real subtlety and low level resolution, but the sound lacks scale and weight	5	●	●					65						168
Rotel RA-931	150	Rather dry and unforgiving sound from this internally well specified and attractively priced amplifier	4	●						35						171
▲ Sony TA-F448BE	250	Classic minimalist interface is matched to carefully considered circuit to broadly satisfactory effect - but keep the volume in check	5	●						55						171
▲ Sony TA-F3000ES	500	Champagne shoebox amp may lack power reserves, but is quick, polished and articulate. In every sense a knockout	5	●	●	●	●	●	●	35						178
▲ Talk Electronics Storm 1	500	Good soundstaging and strong detail are provided by this unassuming and not especially powerful model	6							50					1868	162
▲ Talk Electronics Storm 2	650	Crisp, clean, well defined sound, arguably lacking warmth, but a good midrange purchase overall	6							50						175
TEAC A-BX7R	700	Characterful balance mars an otherwise meticulously designed amplifier. Includes a balanced input, optional MM/MC stage	5						●	50					1869	162
Technics SU-A700 Mk 3	250	Fully equipped, high-tech amplifier ultimately fails the authenticity test, and can sound messy and inarticulate	5	●						45					1870	162
▲ Technics SU-A8000 Mk 2	300	Two-box amplifier looks great, has plenty of gadgets, and makes good, if slightly over-exuberant music	5	●						55						178
Technics SU-A9000 Mk 2	400	Looks like a pre/power amplifier, but in effect it's an integrated, with a rather soft-centred sound to match	5	●						70						175
Woodside ISA230 Disc	1,249	Smooth and inoffensive valve amplifier, though it lacks the sparkle and euphony required for a truly entertaining sound	3							30						116
▲ Yamaha AX-492	220	Powerful, well equipped amplifier at an attractive price, offers powerful and engaging music-making	5	●						85						178
Yamaha AX-592	280	Fine, middle ranking amplifier, with a detailed, dynamic midband but some performance falloff at the frequency extremes	5	●	●	●	●	●	●	100						171
<b>Preamplifiers</b>																
Audiolab 8000C	580	Distinctive, stark neutrality that will not appeal to all. Good value engineering	5	●	●			●								97
Audiolab 8000Q	1,250	Tested with 8000M monoblock power amps	6					●	●						1301	145
▲ Copland CTA-301MKII	1,399	Sweet sounding — but never gets bogged down in audio treacle	4	●											1630	151
▲ EAR 802MC	2,599	Tested with 509 Mk 2 power amp — see over leaf	4	●	●											63
▲ ECA Vista	760	Wind up the volume and blow a breath of fresh music into your system (tested with Lectern power amp — see over leaf)	5												1302	145
Exposure XVII	850	Superbly rhythmical; maybe a bit overpowering in the midband. Tested in Sessions with XVIII Super	5	●	●											142
▲ Jadis JP-30MC	5,978	French tubes, JP-30MC has beautiful build, nostalgic styling and delightful midrange. (Tested with JA 30 power amp)	5	●												60
LFD Mistral Linestage	449	Strong ergonomics, generally decent sound, but a little lacking in detail	6													165
Meridian 501	695	Tight, positive sound, but dispassionate; intense at high levels. Tested with 555 power amp	5	●											1303	145
Meridian 562V	995	Transparent and capable preamp, also features six digital inputs	9	●				●	●							140
Meridian 502	1,295	Extremely sophisticated analogue controller with tremendous flexibility and a fast and tidy presentation (Statements)	7						●							162
▲ Moth 30 Passive	149	Modular system gives cracking results. Passive preamp and power amp warrant Best Buy (tested with 30/Stereo 60)	4													109
Moth 30 Active Line Stage	349	Excellent-sounding ultra-simple miniature preamp	4													165
Muse Model Three	1,990	Natural sounding tranny preamp with useful audiophile features. Works beautifully with 160 power amp (tested in Statements)	5						●							166
▲ Musical Fidelity X-PRE	200	Cleverly configured preamp with many upgrade options, and open, lively and engaging sound. (Tested with X-A50 monoblocks)	4													175
▲ NAD 114	270	Beer-budget preamp, sounds focused, detailed and consistent	6	●	●				●							165
Naim NAC92R	630	Upgradeable preamp uses proprietary socketry. (Tested with NAP90 power amp)	5						●							165
▲ Quad 77 Pre	850	Sophisticated design with 2-way remote control console; open colourful sound and very flexible	4	●	●	●	●	●	●							165
▲ Rega Hal	998	Dedicated to Exon power amps — passive line stages	6	●	●	●	●	●	●							165
▲ Rose RV-23	450	You can pay more to get a more transparent sound, but it's hard to criticise at the price	3	●												77
Rotel RC-971	150	Low price is offset by rather coarse sound quality with certain types of music. (Tested with RB-971)	5													178
▲ Sumo Athena IIB	767	Big, natural and tidy-sounding with very natural reproduction of acoustic and electric instruments. (Tested with Polaris III)	6												1305	145
Talk Hurricane 2L	649	Design of integrity which gets to the heart, if not the soul, of the music	6													165
Thorens TTP2000F	699	Glamorous, shoebox-format, minimalist pre with fine detail and some granularity	3	●	●	●										165
Woodside SC26 Phono	2,233	Synergistic with STA35, with a cool, controlled sound, good focus and transparency. (Tested with STA35 power amp)	5	●	●											100
<b>Power amplifiers</b>																
▲ Alchemist Kraken/Pwr	529	Hardly accurate, but entertaining nevertheless	1							60						124
▲ Arcam Alpha 9P	400	Clear, colourful and well-disciplined, the Arcam is a strong all-rounder that can compete with conviction	1							60						165
▲ Art Audio Quintet	1,393	Switchable triode, ultralinear output stage. In triode mode, these are 15 of the sweetest Watts around. Surprisingly gutsy	1							15						109
Audiolab 8000M	1,600	Strong, controlled sound; confident bass, but colourless	1							125					1301	145
Copland CTA-505	2,099	Grown-up amplifier with a refined, yet never over-civilised air	1							67					1630	151
▲ EAR 509 Mk II	3,699	Combining sonic strengths of transistors and valves, this amp warrants attention. (Tested with 802 pre)	1							100						63
▲ ECA Lectern	880	Tested with Vista. Wind up the volume and blow a breath of fresh music into your system	1							50					1302	145
LFD Mistral Power	449	Infectious upper band vitality, but LF dynamics lacking, and lacks 'grip' and transparency	1							60						165
Meridian 555	750	By providing an open window on the music, this amp is wide open to RF and low level IM distortions	1							60					1303	145
▲ Michell Alecto	1,150	Open, well focused imagery with natural, refined textures	1							50						165
Moth 60 Watt Stereo	599	Miniature power amp lacks control and finesse, not comfortable with difficult speaker loads	1							60						165



## POWER AMPLIFIERS (CONTINUED)

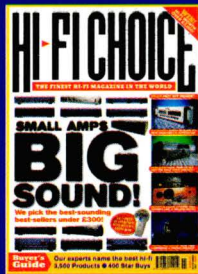
ISSUE NUMBER  
FACTSBACK NUMBER  
RECEIVER  
POWER OUTPUT(W)  
HEADPHONE SOCKET  
REMOTE CONTROL  
MM PHONO INPUT  
MC PHONO INPUT  
LINE INPUTS

Product	Price(£)	Comments	1	100	155
Moth 30 Series Monobloks	879	Tested with Active Preamp. While demonstrating solid, even balance it proved adept at delivering vital musical qualities	1	100	155
Musical Fidelity FX2	800	Quality build and imposing presentation is married to strong power yield, tonal colour and finesse	1	100	165
Musical Fidelity X-A50	500	Cleverly configured and attractively packaged, open, lively and engaging sound. Reviewed with X-PRE	1	50	175
Myryad MA120	450	Based in MI120 integrated – see latter for comments, but sounds significantly better when bi-amped with MI120	1	60	165
NAD 214	370	A little lightweight, but detailed, consistent sound quality, and excellent value for money	1	80	165
Naim NAP90	450	Power amp from a Nait integrated with some improvements	1	30	165
Quad 77 Power	600	Open, bold and colourful, with mild compression	1	85	165
Rega Exon	1,196	Monoblock, priced each, dedicated for Hal preamp. Bold, outgoing, in-command kind of sound	1	125	165
Rotel RB-971	200	Somewhat better than the accompanying preamp – clean, mean and bridgeable. (Tested with RC-971)	1	70	178
Rotel RB-980BX	450	Tames enthusiastically recorded material with a laid-back and occasionally smeared sound	1	120	155
Sumo Polaris III	950	Tested with Athena IIB. Big, natural and tidy-sounding with very natural reproduction of acoustic and electric instruments	1	164	1305 145
Talk Tornado 2	600	Good, but slightly retiring sound which lacks the authority to stand out in a crowd	1	65	165
Thorens TTA2000	599	Low power shoe-box format, but gutsy and surprisingly subtle and articulate	1	30	165

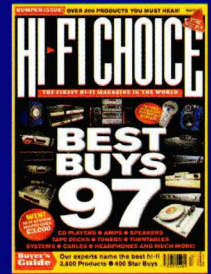
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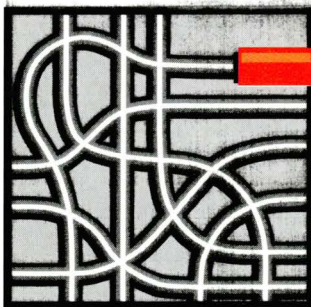
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# HI-FI CHOICE

## Cables



**C**ables — both to connect line-level devices to an amplifier, and to correct the latter to a speaker.— are not just accessories, but an integral part of a system. Though their prices may vary, the most expensive wires are not automatically the best. The best cable for your system will only be found through trial and error, but by combining our recommendations with those of a dealer, you will end up with something suitable. Generally speaking, budget to spend about 10 per cent of the total system cost on cables.

■ Analogue interconnects are the leads that connect between source components and amplifiers, and between pre and power amps. The cables in this section are priced for a one-metre terminated pair.

■ Digital interconnects connect CD transports to DACs, and are traditionally coaxial with a 75 Ohm impedance. They come in optical and electrical varieties, the former being made of plastic or glass. The prices shown are for a terminated linear metre.

■ Speaker cables are used between the amplifier and speaker. Our prices are per unterminated metre. Termination (plugs and soldering) costs vary with brands.

B Best buy

R Recommended

### KEY

**SYMMETRICAL:** A twisted pair of conductors.  
**COAXIAL:** A central 'hot' conductor and a shield that carries the negative signal.  
**STRANDED:** Multiple strands with no intervening insulation.

**SOLID CORE:** Single or multiple, individually insulated strands.  
**COPPER:** Material used for conductor.  
**SILVER:** Material used for conductor.  
**DIG CABLE TYPE:** O - optical digital, E - electrical digital.

**FACTSBACK NUMBER:** The Factsback reference for ordering a fax copy of the review. Use the contents page to find the Factsback information page, elsewhere in this section.

**ISSUE NUMBER:** The issue of *Hi-Fi Choice* in which the original review appeared.

## CABLES

ISSUE NUMBER  
FACTSBACK NUMBER  
DIG CABLE TYPE  
COPPER  
SILVER  
SOLID CORE  
STRANDED  
COAXIAL  
SYMMETRICAL

Product	Price(£)	Comments	1	100	155
<b>Analogue Interconnects</b>					
Audio Note AN-A	18	Not especially impressive: warm but well-rounded balance that restricts 'air' but is quite clear	●	●	108
Audio Note AN-C	35	Neutral but lacking in subtle texture and unable to distinguish fine detail	●	●	1687 131
Audio Note AN-S	99	Up-beat and enthusiastic sound with satisfyingly deep and grumbly bass	●	●	1687 131

CABLES (CONTINUED)

Product	Price(£)	Comments						ISSUE NUMBER	FACTSBACK NUMBER
			SYMMETRICAL	COAXIAL	STRANDED	SOLID CORE	COPPER		
Audio Note AN-V	179	15 individually insulated silver strands make up this very clean and dynamically unchallenged cable	●		●			1687	131
Audioquest Turquoise	40	A 'fit and forget' cable that sounds distinctly lazy	●		●		●		160
Audioquest Topaz 2	60	Sounds flattened out, with poor imaging and grainy treble					●	●	176
CableTalk Advanced 2	35	Slight roughness in loud music barely detracts from a well-balanced performance with good imaging			●		●		176
Cable Talk Studio 2	65	A first-class performer from tonal, dynamic and rhythmic standpoints	●		●		●		160
Cambridge Pacific	30	Lacks subtlety and bass impact but is otherwise quite serviceable for the price			●		●		176
Cambridge Audio Studio Ref	40	Dynamic cable with strong soundstaging and only a slight lack of detail			●		●		160
Chord Company Cobra 2	50	Good, strong sound with full-bodied music, less happy with smaller forces			●		●		176
Connections Midas HD	39	Canary yellow cable with excellent plugs and an open sound. Slight treble glare	●		●		●		160
DNM TC075	34	Price for 0.75m length. High resolution cable, but best in short runs due to higher than average series impedance					●	●	1690 131
DPA Slink	41	Slightly bright and zingy sound with flat soundstaging and hollow sounding bass, vocals and strings sound convincing though					●	●	1690 131
DPA White Slink	75	Bass recedes as the music gets complex; midrange and treble better with quite good detail and imaging					●	●	176
DPA Black Slink	245	Initially dark and meaty but becoming lucid and transparent with running in. Quad geometry, Gore-tex dielectric	●				●	●	1691 131
Goertz M1 Interconnect	145	Soft sound lacking in bite, with excessive and plummy bass (NB sample used in review was only 0.5m)	●				●	●	176
Insert Audio IC100 MkII	47	Mostly good sound is let down by pervasive dryness			●		●	●	176
Ixos 104	20	Open and detailed presentation, full bass and silky if overly smooth treble			●	●	●		1692 131
Ixos Gamma 1002	39	Lumpy bass, grainy treble, and poor integration. Nice colour, though	●		●		●		176
Ixos 103	45	Even-handed and generous sound, bass has a well-rounded, bouncy quality			●	●	●		1692 131
Ixos 102	60	A bit bright and undynamic, this cable is nevertheless a good all-rounder, whose faults are largely subtractive			●	●	●		160
Ixos 101	100	A cable with personality: its veiled and shut in quality bring an earthiness to vocals and rhythm guitar alike			●	●	●	●	1693 131
Kimber Hero	110	Slight roughness detracts from some music; seems well suited to rock and jazz. Lively and detailed	●		●		●		176
Moth Ley Line Black	100	Offers a full and big sound, neutral yet very solid and confident in delivery. Expansive imaging retains music's energy	●		●		●	●	108
Moth Ley Line Grey	200	Detailed enough but there's a sense of distance between the music and the listener: vocals are coarse rather than liquid	●		●		●	●	108
Nordost Black Knight	60	Flat black cable that is distinctive but slightly coloured – but not in a wholly negative manner	●		●		●		160
Nordost Blue Heaven	145	Very good bass and only slightly grainy treble add up to a well integrated, natural-sounding cable	●			●	●		176
Prowire Silver	60	A good cable in every way, with just the occasional hint of coloration and coarseness			●		●		176
PAD Elementa	145	A fat, heavy and frankly rather lazy-sounding cable; best with music for small forces	●		●		●		176
QED Qnect 2	30	Very well balanced, refined and detailed, this is everything a good cable should be, and excellent value			●		●		176
Silvertone Ex-Static	35	Pleasantly unfatiguing and competitively priced cable that lacks detail and insight			●	●	●		160
SonicLink Silver Pink	35	Dynamically sensitive and muddle-free. We're unsure about the flesh-coloured finish though...	●		●		●		160
Sonic Link Black	49	Nickel-plated copper with a slight dryness in the bass and a hint of treble roll-off don't compromise integration.	●		●		●		176
Straight Wire Chorus	40	A very confident cable with good bass, though perhaps a shade of treble loss			●	●	●		176
van den Hul The Storm	25	Price for 0.8m length. Rich and warm but bass is rolled off: however there's plenty of drive and high frequencies are clean			●		●	●	1701 131
van den Hul Source HB	50	Price for 0.8m length. Hybrid carbon-fibre/copper cable that is a paragon of naturalness. Airy and well controlled			●	●	●		160
van den Hul D102 MkIII	70	A cable with everything; good bass, treble, imaging and naturalness				●	●		176
van den Hul The First	210	Using 12,000 carbon fibres, a gentle and subtle sounding cable that conveys oodles of information but lacks dynamic punch			●	●	●		1702 131
van den Hul The Second	240	Wonderfully open and relaxing but also intimately detailed, slightly softens percussive dynamics	●		●		●	●	1702 131
XLO Type 150	50	A restrained but useful cable for taming lively CD players, dynamics lack freedom, treble lacks clarity			●	●	●		1703 131
XLO Type 0.1	180	Unusual but highly expressive and detailed with a hint of graininess on powerful vocals				●	●		1703 131
<b>Digital Interconnects</b>									
Audioquest Digital Pro	100	A silver cable with all the drive of Video Z but lacking its clear cut transparency			●	●		E	108
Chord Codac	36	A connection with a stranded inner core and a sound that lacks integration			●	●		E	108
Chord Prodac	50	Price for 0.6m length. Lively detailed treble, drives music along confidently with no hint of fizz			●		●	E	1706 131
DPA Opti-link	20	Sound is lacklustre						O	108
DPA Digi-link	28	Can seem slightly impassive but there's no avoiding its exceptionally detailed sound			●	●	●	E	108
Ixos 105	25	Extended but soft-edged treble that's mercifully free of fatiguing colourations; plenty of weight, smooth vocals			●	●	●	E	1707 131
Kimber Kable Opti-link	50	Appears to be a bog-standard PMMA fibre, yet sounds a little brighter and livelier than most						O	108

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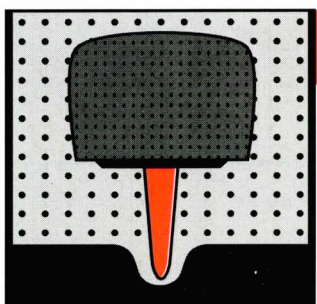
13 John Princes Street, London W1M 9HB (A division of Connection 90' Travel Ltd.)

# CABLES (CONTINUED)

SYMMETRICAL COAXIAL STRANDED SOLID CORE COPPER SILVER

FACTSBACK NUMBER  
DIG CABLE TYPE  
ISSUE NUMBER

Product	Price(£)	Comments	SYMMETRICAL	COAXIAL	STRANDED	SOLID CORE	COPPER	SILVER	FACTSBACK NUMBER	DIG CABLE TYPE	ISSUE NUMBER
Moth Leyline Datalink	140	A thin, coaxial version of Leyline Black with a rather hard and unforgiving character. Too expensive			●	●	●	●		E	108
QED Digiflex	20	A top performance, low-loss 75 Ohm coax with a very open, almost liquid quality		●	●	●	●	●		E	108
Siltech HF-6	145	Sounds detailed, very clean and very extended, but bass is less well resolved — a treat for high-end systems though			●		●	●		E	1709 131
SonicLink Green	60	Spacious, positive and engaging if a bit over-crisp at times — very compelling however			●		●	●		E	1709 131
van den Hul The First	125	Exceptionally natural albeit slightly dark or cautious compared to some, plenty of subtle information and beautiful integration			●	●				E	1710 131
<b>Loudspeaker Cables</b>											
Audio Note AN-D	4.50	Supplied in linear, non-polarised lengths that should be twisted into stereo pairs. Sounds rather grippy and forward					●	●			109
Audio Note AN-B	16.50	Well suited to valve systems, elastic bass, methodical but unintrusive and musical				●		●			1711 133
Audio Note AN-L	29.50	Fruity bass and expressive vocal rendition was appreciated by the panel which was happy to accept its foibles			●		●	●			1712 133
Audio Note AN-SP	150	A calm and civilised presentation, very quiet in the way it reveals subtle low level detail. Great poise and clarity			●		●	●			109
Audioquest F-14	2.2	Ideal for laying under carpets, F-14 encourages a slightly warm and vibrant sound					●	●			109
Audioquest Type 4	5	Four 18-gauge OFHC copper conductors wound in a Litz-type fashion increases capacitance but restrains the cable's 'bite'		●		●		●			109
Audioquest Crystal	25	Neutral balance is spoiled by some graininess and smearing		●		●		●			168
Bandridge LC7409	4	Detailed and up-beat cable. A bit too steely for classical strings				●		●			1800 157
Cable Talk Talk 3.1	2.25	Quite well-balanced but tends to lose bass lines in complex music			●		●	●			168
Cable Talk 4.1	4.25	Smooth and cultured sound that lacks fine detail and is a bit too restrained				●		●			1800 157
DNM LSC350	6.95	Majors on midband and lower treble lucidity at the expense of bass and extreme treble extension		●			●	●			168
DNM LSCB500	12	High impedance can influence the treble response, but this was a winner on sound per pound. Bi-wire					●	●			1716 133
DPA Black Sixteen	100	Unflappable resolution of fine musical details, there's no dampening of dynamics, simply oodles of taut information			●		●	●	●		1717 133
Gale XL189	1	Slightly bright and not too subtle, but a perfectly acceptable cable for any starter system		●		●		●			168
Gale XL315	2	A little lacking in detail but plenty of life and excellent value					●	●			1800 157
Gale XL160-2	2.50	Rhythmic and bouncy-sounding bi-wire cable. Can be slightly manipulative					●	●			1800 157
Goertz M2	32	Remarkably detailed, smooth, neutral and with excellent bass; check amplifier compatibility			●		●	●			168
Heybrook Heywire	3.5	This well-meaning facsimile of earlier ribbon cables ends up sounding lumpy and uneven					●	●			109
Kimber 4TC	19.6	A well-balanced cable with good performance in all areas			●		●	●			168
Naim NACA 5	5.5	Described as a 'dinosaur of a cable', this stiff wire rod doesn't belong outside Naim systems. But it works a treat in them					●	●			109
Nordost Octava	3	Fair bass but confused treble and some coloration		●			●	●			168
Ortofon SPK100	3	Grey-sounding and strips instruments of their natural richness and resonance, a bit bass shy too					●	●			133
Ortofon SPK300	8	Tremendously open and atmospheric, with robust full blooded bass, and dynamic too — if slightly bright at times					●	●			133
Puresonic 7845	1.95	Big, weighty sound — but too messy and bloated for its own good					●	●			1800 157
Puresonic 7891	2.85	Chunky cable design, shame about the sound quality		●			●	●			1800 157
QED Qudos	2.25	Despite high-tech design and excellent Air-Loc plugs, the music failed to gel					●	●			1800 157
QED Profile 4x4	9	Good midrange and treble balance, but bass is rather slack and detail not outstanding					●	●			168
Silver Sounds 12 gauge	15	Basic 'homemade' construction gives fairly neutral sound, though not outstandingly competitive		●			●	●			168
Sonic Link S300	18	Happiest with simple music; tends to smudge detail in complex pieces		●			●	●			168
SonicLink AST50	1.95	It may look like bell-wire, but AST50 sounds detailed, ordered and balanced					●	●			1800 157
van den Hul The Clearwater	7	Despite its evocative title, the Clearwater turns out to be a disappointingly murky-sounding cable					●	●	●		109
van den Hul The Magnum	38	Touted as vdH's most prestigious twin-lead cable, Magnum sounds soft and old fashioned					●	●	●		109
van den Hul The Wind	40	'The Wind' kicks up a storm with its lush midrange and bone-crunching bass!					●	●	●		109
van den Hul Revolution	76	Silver-plated OFC combined with carbon fibre prompts a sombre character with an easy and relaxed treble					●	●	●		1726 133
XLO Pro Type 625	4	Lively but natural and relaxed-sounding — a hint of congestion at frequency extremes					●	●	●		1726 133
XLO Pro 600	16.60	Basically neutral tonality but can become aggressive and two-dimensional		●			●	●			168



## Cartridges

Cartridges fall into two groups: high output MM (moving magnet) models, capable of working directly into most phono inputs; and generally more expensive low and very low output MC (moving coil) models. MC cartridges usually have better mechanical integrity, tighter tolerances and give better performance. Many amplifiers are no longer equipped with the necessary phono input for a cartridge, and a separate phono stage

is necessary. Phono input equipped valve designs need a transformer to cope with MC cartridges. Cartridge/amplifier interfacing can be very subtle, but even basic high output MM designs benefit in overall balance from optimised amplifier capacitance loading.

**B Best buy** **R Recommended**

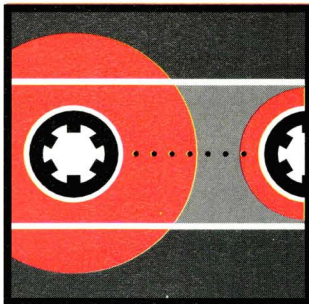
**KEY**  
 MM: Moving magnet cartridge with a normal output suitable for all vinyl disc amplifier inputs.  
 MC: Moving coil cartridge with a low output only suitable for high-sensitivity vinyl disc amplifier inputs.  
 REPLACEABLE STYLUS: Most MM cartridges have a stylus that can be removed and replaced.  
 OUTPUT (MV): Cartridge output in millivolts.  
 MASS (g): Cartridge mass can affect arm choice.  
 FACTSBACK NUMBER: The Factsback reference for ordering a fax copy of the review.  
 ISSUE NUMBER: The issue of Hi-Fi Choice in which the original review appeared.

## CARTRIDGES

Product	Price(£)	Comment	REPLACEABLE STYLUS	OUTPUT (MV)	MASS (g)	FACTSBACK NUMBER	ISSUE NUMBER
Audio Technica AT-95E	20	Clear and dynamic, though richly balanced	●	●	2.8		48
Clearaudio Signature	1,495	A great all-round performer with fine dynamic vitality and a seductive midband intimacy	●	●	0.55	11.5	175
Denon DL110	70	A fine all-rounder, this high output MC model is likely to perform well		●	1.0	6	48
Denon DL160	90	Although listeners just preferred the 110, its brother here survived lab tests and is still 'thoroughly competent'		●	0.1	6	43
Denon DL103	100	Good performance in bass and good 'life'. Is seriously let down by its spherical stylus which kills subtle detail		●	0.1	6	103
Denon DL304	200	Uncoloured, detailed, tracks superbly. Top notch altogether and a bargain too		●			103
Dynavector Karat 17D2 mk2	450	Clean and controlled sound with taut, tuneful bass. Detailed and musically cogent		●	0.15	5.3	158
Dynavector Te-Kaitora	1,698	A real smoothie, but pricey. Worth checking out for its delicate laid-back transparency and low needle-talk		●	0.25	8.5	175

# CARTRIDGES (CONTINUED)

Product	Price (£)	Comment	REPLACEABLE STYLUS		FACTSBACK NUMBER	ISSUE NUMBER
			MM	MC		
▶ Dynavector XX-1L	998	Very clear, very detailed; a response lift around 20kHz seems to do no harm	●	●	0.25 12	84
Dynavector XX-1	998	Good, but not immensely competitive at the price, and not helped by comparison with the low output version	●	●	2.0 12	84
▶ Goldring Elan	19	A lightweight and frisky-sounding MM apparently based on Nagaoka MM4 body	●	●	5.0 7	67
▶ Goldring 1012GX	79	Slightly harsh but plenty of life and detail. Some high frequency colouration apparent	●	●	6.5 7	85
▶ Goldring 1022GX	99	As with 1012, a touch harsh; detail and transient purity improved	●	●	6.5 7	85
▶ Goldring Eroica LX	110	Not the most subtle cartridge in the world: can sound edgy at times, but lively and informative	●	●	0.5 8	84
Goldring 1042	120	Not terribly subtle, and not such good value alongside 1012 and 1022. Quite lively though	●	●	6.5 6	91
Goldring Elite	220	The basics are right, and it will cheerfully tackle any source material, but its sound has a certain dirtiness	●	●	0.5 8	103
Goldring Excel VX	525	Good bass drive but dull and imprecise higher up. An old-fashioned sound that falls short of the true high end	●	●	0.45 8	175
▶ Grado Prestige Gold	149	Rich sounding with an unusually refined top-end for a moving magnet-type cartridge	●	●	4 6	158
Grado Reference	995	Loads of tracking headroom but treble is limited. A prospect for mid-oriented valve amp users	●	●	1.7 6.5	175
▶ Linn K9	125	Linn improved this model by beefing up the Basik's bodywork and adding a super stylus	●	●	4.5 5	Col
London Decca Maroon	259	Now manufactured under the London brand name, this Decca cartridge is as iconoclastic as ever	●	●	5.0 6	67
London Decca S Gold	399	Immediate and detailed, but coloured, nonlinear with a questionable effect on records	●	●	5.0 6	84
▶ Lyra Lydian	649	Superbly capable all-round musical performer that improves markedly when its body cover is removed	●	●	0.3 7	158
▶ Lyra Clavis Da Capo	995	A stable tracker, and one of the finest cartridges we've heard	●	●	0.1 7	143
Lyra Parmassus D.C.t	1,895	A real little jewel of a cartridge, with many good qualities, but handicapped by a rather too obvious treble peak	●	●	0.22 10.5	175
▶ Ortofon 510/P	38	For the price, a good blend of virtues – weight, clarity and neutrality	●	●	3.0 5	85
▶ Ortofon 520/P	65	Sensitive to load capacitance, the 520/P has a lively, effervescent sound	●	●	3.0 5	67
▶ Ortofon MC3 Turbo	130	The 3 Turbo is bright, cheerful and bouncy, but unsubtle – take it as it comes	●	●	3.3 4	103
▶ Ortofon MC15 Super II	130	A good all-rounder, with outstanding resolution, if slightly bright and close up	●	●	0.35 7	103
Ortofon MC25E	180	An excellent upgrade for a mid-price turntable	●	●	0.5 11	139
Ortofon MC25FL	250	A bit too stark and honest, but faithful to what's on the LP	●	●	0.5 11	139
Ortofon MC30 Supreme	525	Highly detailed and even-sounding cartridge that has a special affinity with female vocal recordings	●	●	0.5 10.7	158
▶ Ortofon Rohmann	1,000	A class act in nearly every respect, with fine groove security and a very smooth and even-handed sound	●	●	0.25 8.5	175
▶ Ortofon MC3000II	1,100	A real eye-opener. Nothing to criticise anywhere, one of the very best	●	●	0.12 10	84
Ortofon MC5000	1,500	Limited tracking ability, bright and forward sound, but good stereo	●	●	0.12 10	91
Rega Bias	39	Difficult to mount in some arms due to its shallow build, the Bias offers a gentle, refined sound	●	●	5 4	67
▶ Rega Elys	85	Clearly superior to the Bias, the Elys is more detailed, accurate and convincing	●	●	5.0 5	67
▶ Roksan Corus Black	130	Recognisably related to the Corus Blue, but smoother and more civilised	●	●	6.5 5	91
▶ van den Hul MM-1	250	If woody midrange could be tamed, imaging and security would pull it through	●	●	5.5 6	103
van den Hul DDT-II	600	Outstanding stereo imaging and neutral balance are appealing, but rhythmically the DDT-II is a bit lazy	●	●	0.35 7.6	158
▶ van den Hul MC-10	750	A neutral, balanced performer, gives fine depth and focus and a firm, extended bass	●	●	0.4 6	60
▶ van den Hul MC-One	900	This extended all the positive qualities of the 10, but added greater authority and scale – worth all the extra money	●	●	0.4 6	60
▶ van den Hul MC-Two	1,200	MC-Two rewards with a highly detailed yet fluid and musically convincing portrayal	●	●	0.4 6	72
▶ van den Hul Frog	1,500	Seems to control/suppress surface noise better than its rivals, this delicate and subtle performer has great charm	●	●	0.65 7	175
▶ van den Hul G' hopper IIIGLA	2,800	Undoubtedly one of the finest cartridges available, it has tremendous bandwidth, energy and finesse	●	●	0.4 6	122
▶ Wilson benesch Matrix	786	Extraordinarily well balanced cartridge: neutral and detailed yet lively and rhythmically assertive	●	●	0.58 6	158
▶ Wilson benesch Carbon	1,573	Carbon fibre body contributes to a delightfully clean and open midrange, and a quick, lively and coherent sound	●	●	0.45 7	175



# Cassette Decks

The compact cassette is still the world's most versatile and ubiquitous music storage medium. Buffs may wrinkle their noses, but they all use it.

There should be no problems in connecting a cassette deck to any normal amplifier, but some care needs to be taken in choosing the best tapes for a specific machine. (Trial and error is one effective technique, but many decks have manual bias adjustment and some match up to the tape automatically.) Twin decks offer the option to dub tapes and play two cassettes

sequentially. Autoreverse is a useful feature, but usually implies some mechanical compromise. Useful facilities include tape monitor switching and Dolby S.

**Best buy**

**Recommended**

**KEY**

**DOLBY C:** A rather extreme noise-reduction system not usually associated with high sound quality.  
**DOLBY S:** A desirable derivative of the Dolby SR professional noise-reduction system.  
**DOLBY HX-PRO:** System designed by B&O to extend headroom

for cassette recording.  
**3-HEAD:** If you want to monitor a recording while you are making it, a third head is essential.  
**TWIN DECK:** Contains two decks for dubbing and continuous play. In most instances only one deck will record.

**AUTOREVERSE:** Automatically plays both sides of the cassette.  
**AUTO CALIBRATION:** The deck will automatically set up bias and EQ for any tape.  
**ADJUSTABLE BIAS:** Bias can be manually set to suit the tape being used.

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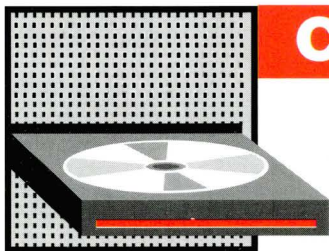
## CASSETTE DECKS

Product	Price (£)	Comments	DOLBY HX PRO		DOLBY S	3-HEAD	AUTO CALIBRATION	ADJUSTABLE BIAS	FACTSBACK NUMBER	ISSUE NUMBER
			DOLBY C	DOLBY S						
▶ Aiwa AD-F450	120	Basic but well-designed budget deck, astonishing value; only the poor metering gives the game away	●	●	●	●	●	●	1513	136
▶ Aiwa AD-WX727	170	High-class twin for those who want bells, whistles - and music	●	●	●	●	●	●	1377	146
▶ Denon DRM-550	160	There are some technical limitations, but this remains a fine sounding deck, and excellent value	●	●	●	●	●	●		158
▶ Denon DRW-580	200	Twin deck: OK for casual use, but will quickly pall with more quality critical applications	●	●	●	●	●	●		171

◀ CASSETTE DECKS (CONTINUED)

DOLBY C DOLBY S DOLBY BX PRO 3-HEAD TWIN HEAD AUTO REVERSE ADJUSTABLE BIAS FACTSBACK NUMBER ISSUE NUMBER

Product	Price(£)	Comments	DOLBY C	DOLBY S	DOLBY BX PRO	3-HEAD	TWIN HEAD	AUTO REVERSE	ADJUSTABLE BIAS	FACTSBACK NUMBER	ISSUE NUMBER
Denon DRS-640	200	Draw-loading deck, with simple facilities and smooth, well-adjusted sound	●	●	●	●	●	●	●	1591	140
Denon DRM-650S	230	An all-round improvement on predecessors, offers a wide-ranging, disciplined sound. Dolby S is not the best feature	●	●	●	●	●	●	●	164	
Denon DRM-740	270	Breathed-on DRM-710, with good external treatment, offers good, if somewhat detached sonics	●	●	●	●	●	●	●	1514	136
Denon DRS-810	310	Draw-loading deck, carefully designed yet lacking in subtlety on audition	●	●	●	●	●	●	●	127	
Harman/Kardon TD420	250	Minor inconsistencies detract from a well-conceived, minimum features design	●	●	●	●	●	●	●	1592	140
Harman/Kardon TD450	350	Draw loader with poor tape navigation features; good midband but shallow bass	●	●	●	●	●	●	●	164	
JVC TD-R472	200	Excellent auto-reverse deck which doesn't suffer the usual disadvantages and is very sharply priced	●	●	●	●	●	●	●	158	
JVC TD-Y662BK	270	Assured, clean and agile sounding recorder, if not quite the most refined in its class	●	●	●	●	●	●	●	1380	146
JVC TD-W718	300	Twin deck. Good for creative live recording, but no timer standby. Respectable though not earth-shattering performance	●	●	●	●	●	●	●	171	
Kenwood KX-W6080	200	Modestly decent sounding twin deck, with some transport instability and ragged bass. The features list is also strong	●	●	●	●	●	●	●	171	
NAD 613	230	Rough and ready, but enjoyable sound, though marred by mechanical motor noise	●	●	●	●	●	●	●	158	
NAD 616	300	Primitive twin deck with basic features. No Dolby setting memory, transports are too unstable for serious quality first use.	●	●	●	●	●	●	●	171	
Onkyo K-611	460	Cute drawer loading mini-size component with 3-heads and dual capstan transport	●	●	●	●	●	●	●	1384	146
Pioneer CT-S550S	250	Great features, good with cheap low bias tapes, but slightly synthetic sound quality	●	●	●	●	●	●	●	164	
Pioneer CT-W806DR	300	Had it not been for the iffy transport quality, this ultra-sophisticated twin would have been recommended.	●	●	●	●	●	●	●	171	
Pioneer CT-S830S	500	High-class mechanism, if lacking in battleship externals, and superb sound	●	●	●	●	●	●	●	1385	146
Sony TC-KE600S	300	Mild setting-up problems notwithstanding, this UK-tweaked design has a smooth, open and un-cassette-like sound	●	●	●	●	●	●	●	158	
Technics RS-AZ6	200	For those who can't afford the RS-AZ7; exquisite clarity over the widest bandwidth thanks to AZ thin-film head	●	●	●	●	●	●	●	164	
Technics RS-AZ7	270	Thin-film head gives a solid, almost CD-like bass and midrange. A clear advance in the state-of-the-art	●	●	●	●	●	●	●	158	
Yamaha KX-490	200	Electrifyingly transparent and capable deck whose only flaw is a trace of audible wow and flutter	●	●	●	●	●	●	●	158	
Yamaha KX-580SE	250	Subtle, engaging and transparent sounding deck, with a lightweight tonality, but good stability and strong detail	●	●	●	●	●	●	●	171	



CD Players brought to you in association with **MISSION**

All CD players offer a basic selection of facilities, and some can keep you entertained for hours as you programme in disc names and track orders. All but the excessively inexpensive feature remote control. Most CD players can be upgraded by adding an outboard DAC (see below). To do this the player needs a digital output of either electrical or optical persuasion; sonically the former is preferable. A CD player can be split into two basic components: the disc drive or

transport, and a 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 most players are contained in a single box, expensive players are usually two-box affairs.

**B Best buy** **R Recommended**

**KEY**

**ELECTRICAL DIGITAL OUTPUT:** For electrical connection to an outboard DAC.  
**AES/EBU ELEC DIG OUTPUT:** Balanced digital output to be used with similarly equipped DACs.  
**OPTICAL DIGITAL OUTPUT:** For optical connection to an outboard DAC.

**AT&T OPT DIG OUTPUT:** High-speed optical output to be used with similarly equipped DACs.  
**BAL ANALOGUE OUTPUT:** Balanced analogue output for amplifiers equipped with balanced inputs.  
**HEADPHONE SOCKET:** For can users.  
**VARIABLE OUTPUT:** Remotely adjustable, volume-controlled output.

**MULTI-DISC:** Equipped with a carousel or multi-tray system for continuous play of multiple discs.  
**DAC TYPE:** Digital to analogue convertor: BS – Philips Bitstream, MB – multibit, Hyb – hybrid of multibit and bit-stream technologies, 1bit – single bit types such as MASH, bitstream, PWM, etc, CC – constant calibration

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CD PLAYERS

OPTICAL DIGITAL OUTPUT AES/EBU ELEC DIG OUT AT&T OPT DIG OUTPUT BAL ANALOGUE OUTPUT HEADPHONE SOCKET VARIABLE OUTPUT MULTI-DISC DAC TYPE FACTSBACK NUMBER ISSUE NUMBER

Product	Price(£)	Comments	OPTICAL DIGITAL OUTPUT	AES/EBU ELEC DIG OUT	AT&T OPT DIG OUTPUT	BAL ANALOGUE OUTPUT	HEADPHONE SOCKET	VARIABLE OUTPUT	MULTI-DISC	DAC TYPE	FACTSBACK NUMBER	ISSUE NUMBER
Acurus ACD11	899	First-rate if costly player from the US, which combines a delightful transparency with an uncontrived naturalness	●	●	●	●	●	●	●	1bit	166	
Acoustic Precision Eikos	1,850	Seriously customised Pioneer with extraordinary resolution and world beating imaging and bass (Statements)	●	●	●	●	●	●	●	1bit	165	
Alchemist Nexus APD32A	597	Refined treble, constrained yet capable bass and attractive all-round presentation distinguish this player from the crowd	●	●	●	●	●	●	●	Hyb	169	
AMC CD8A	150	Has balanced output, but is otherwise rather grey and unremarkable	●	●	●	●	●	●	●	BS	172	
AMC CD9/DAC8	200	Beer budget two box system (player + DAC) is smooth, attractive and easy on the ear.	●	●	●	●	●	●	●	CC	179	
Anthem CD1	1,595	Unusual combination of high-end player, complete with HDCD, and changer. Good, but serious mechanical noise	●	●	●	●	●	●	●	MB	178	
Arcam A pha 7	330	Mildly rehashed favourite comes up smelling of roses.	●	●	●	●	●	●	●	BS	179	
Arcam Alpha MCD	450	Excellent bass and natural midband, but just a touch of treble dryness, from this very listenable changer	●	●	●	●	●	●	●	MB	178	
Arcam Alpha 8	520	Refined, intricately detailed but a little cautious, this should be broadly compatible with a variety of amps	●	●	●	●	●	●	●	BS	1873	163
Arcam 8SE	600	Excellent (and very reasonably priced) HDCD-compatible player is a strong all-rounder	●	●	●	●	●	●	●	1-bit	176	
Audiolab 8000CD	1,000	Developed according to the Green Cross Code of digital audio with an elegant but safe musical presentation	●	●	●	●	●	●	●	BS	1874	163
Audio Research CD1	3,290	Suspends disbelief with a frighteningly real yet obviously coloured sound. A rare proposition among CD players	●	●	●	●	●	●	●	BS	1875	163
AVI S2000MC2	899	A chip off the old block, this model's in-ye-face balance obstructs an otherwise finely detailed and dynamic sound	●	●	●	●	●	●	●	MB	176	
AVI S2000MC Reference	1,399	Lean, dry, high resolution player, built to outlast most of us, and a fine performer in a sympathetic system	●	●	●	●	●	●	●	MB	169	
Cambridge Audio CD4	150	Basic appearance and sluggish track access/track search belies its up and at 'em sound quality	●	●	●	●	●	●	●	Hyb	1268	147
Cambridge Audio CD4SE	200	Among the best players we have encountered at the price, considerably more refined and convincing than CD4	●	●	●	●	●	●	●	BS	1877	163
Cambridge Audio CD6	250	A sharp, lively and articulate player, a real thoroughbred in fact, perhaps too sharp and lively for some systems	●	●	●	●	●	●	●	BS	159	
Copland CDA-266	1,199	Visually simple yet elegant design is unexpectedly sophisticated under the skin, and effective in execution	●	●	●	●	●	●	●	MB	176	
Copland CDA-288	2,199	A gentle giant of a player that errs in favour of pastel shades rather than bold daubs of colour, one for refined tastes	●	●	●	●	●	●	●	MB	1880	163
Symbol CDP12	1,299	Clean, detailed and airy HDCD-equipped player with minimalist trappings	●	●	●	●	●	●	●	Hybrid	176	
Denon DCD-625	200	DCD-615 replacement is generously equipped but lacks sophisticated sound of its forebear	●	●	●	●	●	●	●	MB	1269	147
Denon DCD-825	240	Despite extensive revisions, this latest player still sounds like a typical 18-bit Denon, which is no bad thing!	●	●	●	●	●	●	●	MB	1531	137
Denon DCD-1550AR	350	Disappointing bland and ploddy sound from an immaculately constructed, high tech player	●	●	●	●	●	●	●	MB	179	
Denon DCD-1015	350	Excellent, mid-range player – fast, fluid and lean	●	●	●	●	●	●	●	MB	1599	141
Denon DCD-3000	1,000	Sings with the temperament of a huge orchestra under the baton of a timid conductor, but very agreeable at that	●	●	●	●	●	●	●	MB	1881	163
Denon DCD-635	180	Modest presentation gives little clue to the thoroughbred electronics ticking away inside	●	●	●	●	●	●	●	MB	172	



**CD PLAYERS (CONTINUED)**

ISSUE NUMBER  
FACTSBACK NUMBER  
MULTI-DISC  
DAC TYPE

Product	Price(£)	Comments	AE/SE/EBU ELEC DIGITAL OUTPUT	OPTICAL DIGITAL OUT	AT&T OPT DIG OUT	BAL ANALOGUE DIG OUT	HEADPHONE OUTPUT	VARIABLE OUTPUT	ISSUE NUMBER
Eclipse CD101a	80	If you want to know the sound of high order distortion, this is probably as good a place to start as any							MB 144
Harman/Kardon HD710	200	A player of integrity, but can sound a bit hard and rough when extended, and is somewhat amplifier fussy	●					●	1bit 159
▲ Harman/Kardon HD730	300	Competitive at the price, with a coloured but dynamic and outgoing sound supported by a raft of user features	●					●	BS 166
▲ Harman/Kardon FL8300	300	Generally capable changer with relaxed sound and firm bass. Just a hint of roughness on occasion	●				●	●	MB 178
▲ Helios Model 2	950	This player may not be to everyone's taste, but it is an individual, with some interesting things to say	●						1bit 176
▲ JVC XL-V184BK	120	Excellent budget player, well presented, a tad opaque but its heart is in the right place.						●	1bit 172
▲ JVC XL-V284BK	140	Featuring a new set of bitstream innards, this flexible player has a refined, if occasionally unpredictable sound	●				●	●	1bit 1270 147
▲ JVC XL-Z574	250	Strong resolving power and good midband and dynamics, but slightly raw and thin					●	●	1bit 159
▲ JVC XL-Z674BK	300	Even-handed, but glosses over the most intimate moments					●	●	1bit 1637 151
▲ Kenwood DP-3080	170	<b>Bold, dynamic and outgoing sound, though somewhat aggressive. Poor build quality and finish</b>	●				●	●	1bit 159
▲ Kenwood DP-4090	250	<b>Focuses a clear, wide aperture lens on the music - and has CD Test too</b>	●				●	●	1bit 172
▲ Kenwood DP-5090	300	Disappointing senior brother to the excellent DP-4090, but surface interface is good	●				●	●	1-bit 179
▲ Kenwood DP-7090	400	<b>A lively and compelling performer with an even-handed and coherent disposition</b>	●				●	●	MB 1885 163
▲ Linn Mimik	875	Useful multi-room features matched to strong bass, but poor imagery and transparency	●						Hyb 1762 155
▲ Marantz CD63MKII KI Sig	500	It's the quintessential sound of Marantz - warm, open, and smooth almost to a fault	●				●	●	Hyb 169
▲ Marantz CD-67SE	350	Refined, enjoyable player, though ultimately a little soft-centred	●				●	●	BS 166
▲ Marantz CD-67 Mk II	250	The digital equivalent of a safe pair of hands. Smooth	●				●	●	BS 179
▲ Marantz CD-48	200	Somewhat inconsistent, middle ranking player which hints at better things	●					●	1bit 172
▲ Marantz CD-17	800	Fabulous packaging and an excellent all round performer: smooth, detailed and consistent	●						BS 1763 155
▲ Marantz CD-17KIS	1,100	Minor QC problems aside, this is a superbly turned-out machine, but ultimately a little bland	●				●		BS 176
▲ Meracus Tanto	1,395	Believable tonal colours and textures, refinement takes preference over dynamics - but it's not cheap	●						DS 169
▲ Meridian 506	1,100	<b>Revised 506 includes MSR remote and a new D/A chip, which makes it livelier and more detailed</b>	●				●		1 bit 176
▲ Meridian 508 (20-bit)	1,995	Combines a delicate mid and treble with rich, opulent bass and has impressive low-level resolution	●				●		BS 1886 163
▲ Mission Cyrus dAD3	598	This front loader has a relaxed style of delivery that convinces with guile and subtlety rather than orchestral ordnance	●						BS 1887 163
▲ Mission Cyrus dAD3Q	898	<b>Lucid, transparent and uncontrived sound quality, superb build, and readily upgradeable</b>					●		MB 169
▲ Monrio Privilege	995	Costly and well-engineered, but ultimately rather heavy-handed and dull, if refined player	●						MB 166
▲ Musical Fidelity E60	300	This entry-level player lacks proper stereo localisation and clarity	●				●		BS 166
▲ Musical Fidelity A2	500	<b>Warm (too warm), attractive and open player, a great improvement on (related) E60</b>	●				●		BS 169
▲ Musical Fidelity FCD	1,500	A forward disposition makes this perfect for Fenders but less appropriate to Guarneris	●					●	BS 163
▲ Myryad MC100	700	A little extra get-up-and-go wouldn't go amiss, but its sheer maturity and composure ensure listenability	●						BS 1889 163
▲ Myryad MCD500	1,300	Well-built attractive player, which has much promise, some unrealised, and which can be a little hard going on audition	●						1bit 176
▲ NAD 522	170	Crude, mechanical sounding player fails to tickle the music buds							1 bit 179
▲ NAD 510	200	Pale version of NAD's senior CD players with a stripped down feature count							1bit 172
▲ NAD 512	250	Simple, well-focused presentation, and articulate with it, though hard-nosed quality is not everyone's cup of tea	●						1bit 159
▲ NAD 523	250	Nothing seriously amiss with this classic NAD 'no-frills' changer, but it lacks that vital spark							● Hyb 178
▲ NAD 514	370	Boisterous sound, but undeniably attractive	●					●	BS 1639 151
▲ Naim Audio CD3	1,000	The idiosyncratically packaged CD3 is solid and highly articulate. Always has its feet on the ground though							MB 1765 155
▲ Naim Audio CD2	2,000	Provides bags of detail with a solid stereo focus but not all the romanticism we know to be possible							MB 1890 163
▲ Onkyo DX-7210	260	Well-bred CD player features an unusual digital filter, is smooth and cultured without appearing grey or boring	●				●	●	BS 1273 147
▲ Onkyo DX-7510	400	Strongly flavoured, assertive sound	●				●	●	BS 1640 151
▲ Orelle CD-100EA	649	Excellent imagery, timing and transparency, and readily upgraded or reconfigured	●				●		MB 166
▲ Philips CD-721	130	<b>Surprisingly well-sorted, articulate if slightly glossy and attractively presented sound. Captive signal lead</b>							1bit 159
▲ Philips CD751	150	Inconsistent and occasionally opaque and scrawny sounding cheapie	●					●	1bit 172
▲ Pioneer PD-S705	300	A dichotomy, this machine was loved by some for its articulacy and disliked by others for sounding too impressive!	●				●		BS 1891 163
▲ Pioneer PD-F906	350	Interesting appearance and concept, but this changer's sound is seriously lacklustre and ergonomics frustrating					●	●	1bit 178
▲ Pioneer PD-S904	400	Too much legato - literally - in sound, but a very smooth performer	●				●		1bit 1641 151
▲ Pioneer PDS-06	550	Technologically sophisticated, Pioneer's first multi-bit player for years is polished and capable, if a tad laid back	●				●	●	MB 176
▲ Pioneer PD-S505 Precision	460	<b>Assured, fluid-sounding player, with great spatial coherence</b>	●				●	●	1bit 166
▲ Quad 77	900	A true thoroughbred combining a penetrating insight into detail with poise rarely found at the price							Hyb 1893 163
▲ Roksan DP3P	1,495	Dramatic and compelling, classical listeners should be ready to 'air conduct' when auditioning this player	●						BS 1896 163
▲ Roksan Caspian	895	Solid, articulate, and fundamentally well-engineered player, but with some subtle low-level limitations	●						Hyb 169
▲ Rotel RCD-970BX	375	A combination of solid build, useful facilities and an attention grabbing sound make this a winner	●						BS 1897 163
▲ Sherwood CD-4030R	180	Easy on the ear, smooth-sounding player, with limits set by the slightly soft, compressed quality - and messy fascia					●	●	BS 159
▲ Sherwood CD1	1,100	A very neutral, even handed sounding player with a rather flat, lifeless sound. Beautiful construction	●				●		BS 1899 163
▲ Sony CDP-XE310	140	Excellent value and bright as a button, but can sound OTT in some systems						●	1-bit 179
▲ Sony CDP-XE510	180	Souped up CDP-XE500 which tells a rather bland and unengaging story					●	●	1bit 172
▲ Sony CDP-XE900E	300	Refined and analytical disc scavenging tool, but there are some distinctive colourations making auditioning vital					●		BS 159
▲ Sony CDP-XA20ES	450	High tech, with a long list of gadgets, this is an oddly configured player that ultimately sounds less than compelling	●				●		1-bit 176
▲ Sony CDP-X3000ES	500	<b>Shoobox format player, with looks to die for, and switchable digital filters to tweak the already excellent sound</b>	●				●	●	BS 169
▲ Teac 3450SE	200	<b>For once a budget player where the gadgets take second place to respectable, budget amplifier-friendly sonics</b>	●				●	●	1bit 166
▲ Teac CD-5	350	Bright, breezy and up-beat - but short in the trouser department	●				●		BS 1643 151
▲ Teac VRDS-7	599	Although bold and outgoing, this player can sound both intrusive yet lacking in fine detail	●				●		BS 1769 155
▲ Teac VRDS-9	700	Well-presented, heavyweight midi, the Teac is crisp, yet shallow, and inconsistent in sound quality and partnering skills	●					●	1-bit 176
▲ Teac VRDS-10SE	850	Superbly built and presented, but rather leaden bass, with an over-prominent and not ideally refined mid/top	●						BS 169
▲ Teac VRDS-25	1,300	A solid player in all respects combining powerful sound with state-of-the-art technology	●				●		MB 1903 163
▲ Technics SL-PG480A	130	Full driving sound, but somewhat uneven in balance with a unsteady, slightly harsh top end							1bit 159
▲ Technics SL-PS670D	200	Fine, middle ranking player which sounds solid, sometimes even a little stolid.					●	●	1 bit 179
▲ Technics SL-PS770D	250	High tech and well built technology battleship which smoothes the rough edges off the music					●	●	BS 172
▲ Technics SL-MC410	250	If you fancy a CD player that holds 111 discs, this one's cheap, pretty capable, and easy to use						●	Hyb 178
▲ Trichord Genesis	549	Breathed-on Pioneer is warm and mellifluous, but ultimately lacks drive and authority.	●					●	Hyb 169
▲ Trichord Revelation	799	Well-ordered and clean sound that may be a little too refined for some, images well	●					●	1bit 166
▲ XTC CDP-1	1,250	Bright and sometimes abrasive, but detailed player	●					●	MB 176
▲ Yamaha CDC-665	220	<b>This player offers many useful features and highly listenable sound, with tidy and tuneful bass and good imaging</b>	●				●	●	1bit 178



CD PLAYERS

ISSUE NUMBER  
FACTSBACK NUMBER  
MULTI-DISC  
DAC TYPE  
VARIABLE OUTPUT  
HEADPHONE SOCKET  
OPTICAL ANALOGUE OUTPUT  
AT&T OPT DIG OUTPUT  
BAL ANALOGUE OUTPUT  
AES/EBU ELEC DIG OUT  
ELEC DIGITAL OUTPUT

Product	Price(£)	Comments	OPTICAL ANALOGUE OUTPUT	AT&T OPT DIG OUTPUT	BAL ANALOGUE OUTPUT	HEADPHONE SOCKET	VARIABLE OUTPUT	MULTI-DISC	DAC TYPE	FACTSBACK NUMBER	ISSUE NUMBER	
<b>TRANSPORTS</b>												
Arcam Delta 250	800	This model is based on a Philips CDM9 transport. Specification includes Sync Lock facility	●	●	●	●	●			- 1491	130	
Audiolab 8000CDM	1,400	Super-slick transport and basically very honest sound, but lacking the last degree of fine detail	●	●	●	●	●			-	162	
Linn Karik	1,850	Based on early Linn transport, the Karik is dry but very positive, detailed and engraving	●	●	●	●	●			- 1323	144	
Meridian 500	1,245	Used with the 563 DAC, the combination is thin, brash and uncomfortable	●	●	●	●	●			- 1103	133	
PS Audio Lambda	2,250	With Ultralink Two, sound positively sparkles with colour and resonant detail. (Tested with Ultralink 2 DAC)	●	●	●	●	●			- 1106	133	
Roksan Attessa ATT-DP3	1,295	Not the most detailed or refined but capable of sounding exciting with the right material	●	●	●	●	●		1bit		162	
Teac VRDS-T1	550	Superb quality engineering is mated to tidy and composed sound (tested with D-T1)	●	●	●	●	●			- 1325	144	
Theta Data Basic II	2,397	Uses a Philips CDM9 Pro mechanism and works a treat with more lively DACs	●	●	●	●	●			- 1494	130	
Thorens TCD2000	999	Lively presentation not helped by rather loose bass and splashy treble. (Tested with TDA 2000 DAC)	●	●	●	●	●			-	162	
Trichord Digital Turntable	699	Very detailed, precise, controlled yet involving; a first-rank performer	●	●	●	●	●			-	162	
Wadia 8	3,195	Budget version of Teac's VRDS mechanism in a fancy case, but just too expensive for the performance on offer	●	●	●	●	●			- 1495	130	
<b>DACS</b>												
Arcam Black Box 50	350	Measured and sophisticated sound from a DAC that leaves plenty in reserve for future upgrades								Hyb	1506	133
Arcam Black Box 500	500	Sophisticated unit with sync lock and discrete DAC								BS	1519	136
Audio Note DAC1	675	Oddball DAC with manual de-emphasis switch. Needs a high preamp input impedance or bass will suffer								MB		127
Linn Numerik	1,500	A new 20-bit DAC and revised Karik transport have cleaned up; but sounds a bit dry and humourless								MB	1323	144
PS Audio UltraLink 2 HDCD	2,590	The sound positively sparkles with colour and resonant detail. (Tested with Lambada transport)								MB	1106	133
PS Audio Reference Link	4,550	Consolidates reputation of PS Audio for high performance digital electronics								MB	1069	132
Roksan Attessa ATT-DA2/DS5	1,145	Not the most detailed or refined but capable of good excitement with the right material								1bit		162
Teac D-T1	500	Teamed with VRDS-T1 for test, this superb quality unit is tidy and composed								BS	1325	144
Teac D-700	600	With P-700, the D-700 may lack the resolution, but is bubbly and entertaining								MB		120
Thorens TDA2000	700	Lively and up-front presentation not helped by rather loose bass and splashy treble								BS		162
Trichord Pulsar Series One	1,395	Very detailed, precise, controlled yet involving; a first-rank performer. Switchable phase, dither etc								Hyb		162

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Digital Recorders

Digital recorders have been available in a variety of different guises, but only Minidisc has had any impact on the domestic market. Even then, it's early days, and a new rewritable CD from Philips has upset the applecart. At present there are four types to choose from: DAT (digital audio tape), MD (MiniDisc), CD-R (CD Recordable) and CD-RW (CD Rewritable). MD's claim to fame is its optical disc format, which offers instant track access. DAT has been on the market for quite some time now, but has never really 'made it' as a

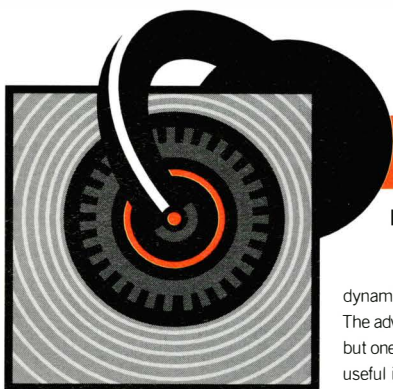
consumer medium due to the dearth of pre-recorded material. However it has begun to carve itself a niche in the top end of the market, replacing reel-to-reel as the audiophile's tape based medium. Home CD-R is coming into its own with Pioneer's two models and aggressively pitched new ranges from Philips.

**B Best buy** **R Recommended**

KEY	ADC TYPE	ELECTRICAL IN/OUTPUTS	section
FORMAT: Type of recorder, see above for descriptions.	ADC TYPE: Analogue to digital converter types as per DACs.	ELECTRICAL IN/OUTPUTS: Digital socketry for electrical cable.	section
DAC TYPE: Digital to analogue converter: BS - Philips Bitstream.	PORTABLE: Can be operated from batteries but is not necessarily personal stereo size.	FACTSBACK NUMBER: The Factsback reference for ordering a fax copy of the review. Use the contents page to find the Factsback information page, elsewhere in this	ISSUE NUMBER: The issue of Hi-Fi Choice in which the original review appeared.
MB - multibit, Hyb - hybrid of multibit and bitstream technologies, 1bit - single bit types such as MASH, bitstream, PWM etc.	OPTICAL IN/OUTPUTS: Digital socketry for optical cable.		

DIGITAL RECORDERS

Product	Price(£)	Comments	FORMAT	DAC TYPE	ADC TYPE	PORTABLE	ELECTRICAL IN/OUTPUTS	FACTSBACK NUMBER	ISSUE NUMBER
Denon DMD-1300	500	Sound sometimes lacks integration but tonal balance is good and it handles loud music with panache	MD	BS	BS	●	●		177
A Kenwood DM-9090	550	Slight sibilance and image vagueness do not detract from excellent balance and solid bass	MD	BS	BS	●	●		177
Onkyo MD-121	450	Midi-sized deck that sounds slightly coloured at times, though immediate and lively	MD	BS	BS	●	●		177
Philips CDR-870	500	The first re-writable CDR, but has jitter problems in direct digital dubbing	CD-R	BS	BS	●	●		174
Pioneer PDR-04	700	Scaled down version of the PDR-05 (see below) with auto level setting but all the socketry and features you need to make CDs	CD-R	BS	BS	●	●		171
Pioneer D-05	900	Second generation 96kHz DAT recorder can offer startling realism	DAT	BS	BS	●	●	1652	152
Pioneer PDR-05	1,000	The first domestic — excellent sound quality	CD-R	BS	BS	●	●	1652	152
Pioneer D-C88	2,000	State-of-the-art portable 96kHz DAT recorder, the size of a lap-top computer	DAT	BS	BS	●	●	1431	150
A Sharp MD-R2	300	Budget recorder that loses little or nothing in comparisons with much more expensive models — highly capable	MD	BS	BS	●	●		177



# Headphones

There are a number of approaches to headphone design. Among the more expensive models, electrostatic drivers are used in open-backed phones. Most models feature dynamic (moving coil) drivers in circular, open or closed-back designs. The advantage of open backs seems to be a correspondingly open sound, but one can also hear external noise, of course. Closed-back designs are useful in situations where it is necessary to block out noise. In recent

years, a number of manufacturers have started to offer cordless headphones using infrared or radio waves. For best results a separate headphone amplifier is recommended.



## KEY

TYPE: Operating principle: D - dynamic, E - electrostatic.  
 SUPRA-AURAL: Style where a flat pad presses on the outer ear.  
 CIRCUM-AURAL: Style which encloses the ear.  
 OPEN BACK: Offers an open sound but lets in noise.

CLOSED BACK: Keeps out external noise.  
 WEIGHT (G): Mass in grams  
 IMPEDANCE (Ω): Load offered to the headphone amplifier. All things being equal, the lower the impedance the louder the sound for a

given amplifier output.  
 3.5MM JACK ADAPTOR: Can be used with mini-jack-equipped components such as personal stereos.  
 FACTSBACK NUMBER: The Factsback reference for order-

ing a fax copy of the review. Use the contents page to find the Factsback information page, elsewhere in this section.  
 ISSUE NUMBER: The issue of Hi-Fi Choice in which the original review appeared.

## HEADPHONES

Product	Price (£)	Comments	TYPE	CIRCUM-AURAL	OPEN BACK	CLOSED BACK	3.5mm JACK ADAPTOR	WEIGHT (G)	IMPEDANCE (Ω)	FACTSBACK NUMBER	ISSUE NUMBER
AKG K1000	700	One of the best dynamics on the market, hooks directly into speaker outputs	D	●	●			270	120		99
Audio Technica ATH910PRO	80	The closed back 910s are an improvement on the 909s, with a nice rhythmic quality rarely found in headphones	D	●		●		280	40		55
Beyer DT100	160	Rugged, modular professional design, but bass is woolly and treble lacks detail	D		●	●		350	600		157
Beyer DT311	50	Uncharacteristically tight, unrefined sound quality from this otherwise well engineered 'phone	D	●	●			124	40	●	1098 133
Beyer DT411	63	A reasonable but not very thrilling headphone that doesn't really offer enough at the price	D	●		●		120	250		111
Beyer DT511	106	Superb midband clarity and speed slightly at odds with soft bass. High tingle factor even so	D		●	●		200	250		172
Beyer DT531	135	A good buy for serious, heavy-duty music making	D		●	●		245	250		144
Beyer DT911	170	Probably too revealing for many headphone amps, these are very subtle and fine, if expensive cans	D		●	●		275	250		111
Denon AH-D550	80	A competent 'phone with integrity, but little panache or charisma. Hard headband causes brain strain	D		●	●		200	35	●	1801 157
Denon AH-D750	130	Loud and gutsy, meaty bass, good with rock and dance. Can sound thick and clumsy	D		●	●		250	30	●	172
Grado SR-40	45	Cheap and nasty appearance largely redeemed by cheerful, up-beat sound. Very comfortable	D	●		●		120	32	●	172
Grado SR-80	100	Clear, open and dynamic with pedantically open mid-band. Crude physical design, rough frequency extremes	D	●		●		60	8	●	1801 157
Grado SR-225	200	Warm, darkly-coloured tonally and ultimately lacking in clarity, but true to the spirit of the music if not the letter	D	●		●		200	32	●	1883 163
Jecklin Float Model 1	79	While very unusual in appearance, the Floats give remarkable sound quality and openness at a reasonable price	D	●	●			400	200		55
Jecklin Float Model 2	99	Helmet shaped, but open sounding and comfortable in the long term, despite lack of adjustment	D		●	●		400	200		63
JVC HA-D910	65	Broadly acceptable if unexciting design with low level losses and some colourations	D	●		●		220	32	●	121
JVC HA-W60	49	Remarkable lack of interference and hiss ameliorates adequate sound of this cordless design	D	●		●		165	I/R	●	172
Precide Ergo Model 2	140	Still has much of the spaciousness and detachment of the Float from which it is derived, but coarse mid/top	D			●		380	100		1892 163
Philips SBC 3396	70	Remarkably airy for closed-back designs. Fine tonal balance, punchy delivery. Amazing for money	D	●	●			255	32	●	172
Philips SBC HP900	90	Sharper, snappier midrange than 3396 initially impressive but blows the balance and listenability	D		●	●		200	32	●	172
Sennheiser IS 380	55	As close as you'll get to real hi-fi with infra-red phones at this price. Inevitable hiss spoils the illusion	D	●		●		192	I/R	●	172
Sennheiser HD 455	55	Inoffensive, if nondescript sound, modular, but can become dislodged from head	D	●		●		185	60	●	1801 157
Sennheiser HD 475	80	Elegant, uncluttered sound and very comfortable but lean bass saps satisfaction	D	●		●		120	60	●	172
Sennheiser HD 545	125	Fine all rounder that takes all styles of music in its stride. Ear-clamping headband	D		●	●		255	150	●	172
Sennheiser HD 565 Ovation	150	Wide bandwidth design which is refined, expressive and extremely comfortable	D	●	●			255	150	●	1801 157
Sennheiser HE 60/HEV70/UK	998	Very nearly a superb electrostatic, with a pure midband, but top end is sibilant and edgy	E		●	●		260	n/a		1898 163
Sony MDR-CD770	100	Neutrality and comfort make the Sony easy to live with. Technically correct-sounding too, yet musically unrewarding	D	●		●		-	-	●	1801 157
Sony MDR-CD1700	200	Astonishingly detailed, uncoloured and free of the usual artefacts from a sealed back headphone. Tremendous value	D	●		●		325	32	●	1901 163
Sony MDR-F1	100	Natural, easy-going sound teamed with great looks and comfort. Shame about the lightweight bass	D		●	●		300	12	●	172
Technics RP-DJ1200	130	Functional design with head-pulping bass and muggy tonal balance. Good job they're sweat-proof	D	●		●		230	32	●	172
Stax Lambda Nova Basic	449	Refined, articulate, yet with real presence - and a notable bargain by electrostatic standards	E		●	●		347	n/a		1902 163
Vivanco IR5800	50	Consistently musical infra-red design. Doesn't reach for sonic heights so hiss can be forgiven	D	●		1/2		226	I/R	●	172
Vivanco SR650	50	Unusually comfortable 'phone with excellent detail resolution but aggressive, thanks to tweeter resonance	D	●		●		175	-	●	1801 157
Vivanco SR750	60	Cossetting physical design, attractive sound and pricing, though suffers overhang and lacks ultimate dynamics	D	●		●		188	-	●	1801 157
Vivanco Cyberwave FMH3000	80	The only cordless headphone to offer genuine walkabout freedom. Unfortunately, sounds like a cheap FM tuner	D	●		●		210	FM	●	172

FOR MORE IN-DEPTH INFORMATION ON REVIEWED PRODUCTS, CHECK OUT OUR WEB SITE AT [www.hifichoice.co.uk](http://www.hifichoice.co.uk)

# HI-FI CHOICE



# Hi-Fi Loudspeakers

Brought to you in association with **KEF**

**A**s the last link in the hi-fi chain, the loudspeaker is at the mercy of the signal it is called upon to reproduce. Nevertheless, the distortions introduced by loudspeakers (and rooms) tend to be the most obvious.

The average loudspeaker consists of an enclosure plus a couple of drive units 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. 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 it goes), for the given box size.

Subwoofers augment the bass and are available as passive (unamplified) and self-amplified active form. Unlike regular speakers, they are not too fussy about their position in the listening room



KEY		IMPEDANCE (Ω):	reproduce, based on in-room measurements.	FACTSBACK NUMBER:
SIZE WxHxD (cm):	Width by height by depth in centimetres.	Measured in Ohms, impedance is a measure of how hard a loudspeaker is to drive: the lower the number the more powerful the amplifier needs to be.	FREE SPACE: Speakers should be placed away from walls.	The reference for ordering a fax copy of the review. Use the contents page to find the Factsback page.
FLOORSTANDER:	As opposed to requiring a dedicated stand.	BASS FROM (Hz): The lowest frequency that a speaker can	CLOSE TO WALL: It is recommended that these speakers be placed close (between 3 and 12cm) to the rear wall.	ISSUE NUMBER: The issue of Hi-Fi Choice in which the original review appeared.
SENSITIVITY (dB/W):	Efficiency — how much sound you get for a given input. The higher the figure the louder the speaker.			

## HI-FI LOUDSPEAKERS

Product	Price(£)	Comments	SIZE WxHxD(CM)	SENSITIVITY(dB/W) FLOORSTANDER	IMPEDANCE(Ω)	BASS FROM (Hz)	FREE SPACE	FACTSBACK NUMBER CLOSE TO WALL	ISSUE NUMBER
Acoustic Energy AE200	250	Metal cone miniature has a tendency to shout but is still lots of fun, and well built too	18.5,30,25	87	6	40	●	177	
Acoustic Energy AE109	350	Lots of mass-loaded twin-driver speaker for the money, especially for loud, driving bass	18,90,25	● 88	4	25	●	1904	164
Acoustic Energy AE120	500	Attractive presentation and good sonic headroom, but a heavy, uneven overall balance, and a difficult amp load too	18,98,28	● 89	4	25	●	170	
ATC SCM20	1,599	Massively built, invariably informative but the rather forward presentation can be uncomfortable	24,44,31	83	8	28	●	86	
Audio Gem Emerald	540	Pretty compact floorstander with lively if lightweight sound	18,94,21	● 87	6	40	●	1905	164
Audio Note AN-J/B	799	Light damping and local unevenness add some colouration, but don't spoil the speaker	38,58,25	93	8	25	●	110	
Audio Note AN-E/B	1,299	Coherent, dynamic and transparent, with extended bass and high sensitivity - but ugly!	36,84,28	● 94	8	20	●	106	
Audio Physic Tempo	1,999	Tall and unusually-styled floorstander has stunning stereo but suspect bass tuning	22,107,47	● 88	8	28	●	1344	143
AVI Positron	899	Suited to smaller rooms, this 'mini-floorstander' is capable of great precision and delicacy, but in a rather small scale way	17.5,25,7784	● 85	6	40	●	174	
B&W DM302	150	Highly competent and neutral all rounder; clever Prism enclosure	19,32,22	88	4	45	●	1778	156
B&W DM601	199	Great main driver for the price, entertaining dynamics	20.5,35.5,23	88	6	30	●	1779	156
B&W DM602	300	Prefers tall stands and space, but offers impressive midband dynamics and musical tension	24,49,31	90	8	30	●	1654	152
B&W DM305	350	Ridged paper cone gives lively sound, clever box, but a little uneven	22,87,31	● 89	4	40	●	1908	164
B&W DM603	500	Squat floorstander with decent dynamics and well-judged, restrained balance; bass could go deeper	23.5,88,29	● 89	7	45	●	170	
B&W CDM1 SE	600	A gorgeous looking stand-mount with one of the best midbands around, and a subtle blend of other qualities	22,37,29	88	5	40	●	177	
B&W CDM7	1,000	A combination of serious welly and physical elegance; a basic lack of midband smoothness rather let the side down	22,97,29	● 80	4	22	●	174	
B&W Matrix 805 V	1,095	Stylish, remarkable imaging, good balance and low colouration	33,33,21	87	8	30	●	98	
B&W Matrix 804	1,695	A great all-rounder which combines exceptional bass extension with fine sensitivity	26,96,26	● 88	4	20	●	167	
B&W Matrix 801S3	3,995	Lacks transparency and the drama of the best dynamics, but acoustically a tour de force	44,100,56	● 87	8	20	●	81	
Castle Isis	250	A great miniature at a very competitive price. Sound is lightweight but very coherent, with a fine overall balance	17,35,5,21	87	8	45	●	170	
Castle Kendal	500	A beautifully finished compact floorstander with a decidedly forward but communicative sound. Try before you buy	17,76,20	● 86	6	45	●	177	
Castle Severn 2	539	Carbon fibre cone gives lovely, subtle midband but treble is a bit dull and bass a bit thumpy; lovely cabinet work	21,84,25	● 87	8	30	●	174	
Castle Avon	730	Lovely box and lovely voices from carbon-fibre composite cone	22,91,28	● 85	8	22	●	1909	164
Castle Harlech	880	Handsome big-sounding floorstander, great value and dynamic midrange	20,96,33	● 88	8	28	●	1820	160
Castle Howard S2	1,200	Able to fill the gap between Chester and Winchester; has a rich, laid-back balance	26,104,41	● 90	8	40	●	1078	132
Celestion 12i	119	Not without virtue, but in the long run the relentless enthusiasm and mid-band colourations can become wearing	19,31,21	88	6	45	●	179	
Celestion 23i	300	Cosmetically flawed, but the bottom end has fine get-up-and-go, and works well with dance tracks	24,86,27	● 89	6	30	●	177	
Celestion A1	899	Rich, warm and laid-back, but a true quality sound; lovely build	24,41,35	88	6	25	●	1910	164
Cerwin-Vega VS10	350	Not very refined but extremely ballsy; these rock boxes have no shortage of gung-ho	33,70,29	● 95	6	37	●	1758	155
Chario Syntar 100	249	Pretty with a pleasantly easygoing balance, but not the most communicative or exciting sound around	18,32,27	87	6	45	●	170	
Dali 104B	370	Lively, rich sounding and communicative. Shame about bland styling and dull balance	22,86,27	● 93	4	28	●	1657	152
Dali 606	400	A big bruiser at a tempting price, Dali's 'no-frills' 606 sounds refined and polite, but also packs some punch	22,97,32	● 91	4	25	●	174	
Dynaudio Audience 5	400	Follows the Dynaudio tradition for fine midband transparency, but the overall timbre is a bit thin and cold	20,31,26	85	4	40	●	177	
Dynaudio Audience 50	577	This compact stand-mount doesn't look big, but sound quality can match many models at twice the price	20,33,25	86	4	30	●	174	
Dynaudio Contour 1.8	1,842	Wonderful voice-band delicacy and loads of deep bass from a very elegant and compact box	21,95,29	● 85	4	20	●	167	
Eltax Linear Response	249	A curiously dumpy shape, this smooth and laid back performer is very easy on the ears, with fine tonal accuracy	25,35,32	85	4	40	●	177	
Epos ES12	499	High quality luxury stand-mount has great midband and stereo imaging	20,38,25	85	8	45	●	1823	160
Epos ES14	675	Substantial stand-mount delivers delightful midrange focus and delicacy with good bass control	23,49,29	87	8	25	●	98	
Epos ES25	1,655	Handsome floorstander with a rather uneven and bass heavy balance	24,90,35	● 88	6	22	●	1346	143
Faraday Siren	445	High mass concrete cabinet is let down by imbalance of ageing driver combination	25,27,46	90	4	48	●	94	
Gale 2i	140	Unspectacular sound and appearance fail to help this solid little miniature stand out from the crowd	22,40,27	88	7	40	●	170	
Genexxa Pro	160	Terrific treble and upper-mid but coloured and cuppy lower-mid and bass. A mixture of genius and grot.	14,27,14	86	8	90	●	179	
GLL Imagio IC130	500	Lots of speaker for the money, but sound is decidedly dull and shut in	22,112,29	● 88	4	20	●	1824	160
Heybrook Prima 2	159	Great openness, clarity, speed and timing. Sounds fresh and vital, though sometimes lacks scale and weight	20,29,18	87	6	50	●	179	
Heybrook Heylette	269	Attractive traditional-style near-miniature has fine bass-to-mid integrity, but dull and shut-in top end	19.5,30,20	89	6	45	●	170	
Heybrook Heylios	389	Great all-round performance in a pretty package at a sharp price	24,36,27	87	6	25	●	164	
Heybrook Heylo	439	Good vocal reproduction, but sounds thin and bass seems an afterthought	23,73,19	● 88	8	30	●	1658	152
Heybrook Quartet	649	Solid, large bookshelf model with good sensitivity and a lively, forward sound	24,41,22	90	8	48	●	122	
Heybrook Ultima	649	Has the bass wallop to justify its dual hi-fi/home cinema roles, but didn't get our listeners particularly excited	22,97,29	● 89	6	45	●	174	
Heybrook Sextet	1,299	Coherent and highly analytical, partly due to distinct upper-mid forwardness	27,90,20	● 88	8	25	●	102	
Infinity Reference 1i	150	Although not to our tastes, this is a competent speaker, and decent material value	20,34,20	89	6	50	●	1403	148
Jamo BX100A	350	Offering a cracking output for their size, these rock boxes can be a bit bright but have decent bass	31.5,54,28	91	8	40	●	1758	155

# HI-FI LOUDSPEAKERS (CONTINUED)

Product	Price(£)	Comments	SIZE WxHxD(CM)	SENSITIVITY(DB/W)	IMPEDANCE(Ω)	BASS FROM (Hz)	FACTSBACK NUMBER	ISSUE NUMBER
Jamo Classic 8	400	A lot of speaker for the money; good when playing quietly, but boom 'n tizz character sounded crude	22,90,29	●	90	4 28	●	1659 152
Jamo 477A	500	Very prettily styled, but build and sound quality are disappointing at the price	19,77,28	●	88	4 40	●	1549 138
Jamo 507A	700	Exceptionally imaginative styling keeps the front view super slim yet still packs a punch. Glass top is a neat extra touch	22,94,37	●	88	3 40	●	174
JBL LX2	250	Lively and invigorating, if a touch crude, this good-hearted speaker reproduces music with considerable enthusiasm	22,40,27	●	87	8 40	●	170
JBL L20	700	Pricey, heavy and a bit laid back, but this is a fine rock 'n' roller which is dynamic and communicative	26,42,28	●	86	8 30	●	1550 138
JBL SVA1500	700	A distinctive Pro-style bi-radial horn tweeter, and the sound is quite a lot of fun, enlivened by a juicy bass thump	17,5,51,31	●	86	8 40	●	174
JBL L40	1,000	Classic, large, stand-mount 3-way is full of vim and vigour, with a superb sense of balance	30,65,31	●	88	4 23	●	167
JBL L90	1,500	A classic monitor which communicates with gusto and enthusiasm, though it can sound a bit crude	24,94,35	●	91	6 23	●	1348 143
Jordan Watts JH400	565	Piano-finish hexagon has controversial sound, with uneven balance but delightful mid	28,38,21	●	86	8 50	●	106
JPW Mini Monitor	60	Ultra-cheap miniature works well in a limited way	18,27,17,5	●	86	8 50	●	1781 156
JPW Gold Monitor	80	More informative than Mini Monitor — but fiercer too	18,27,17,5	●	86	8 50	●	1782 156
JPW ML510	130	Lots of good-quality speaker for the price, but not an ideal match for cheap budget components	20,34,22	●	88	5 50	●	169
JPW ML710	230	Good material value but disappointingly uneven bass — check out the 510s and a pair of proper stands instead	20,88,30	●	88	5 40	●	177
JPW ML1010	400	A seriously substantial speaker for the price, and an obvious choice for those who like their music loud	22,5,115,40	●	91	6 25	●	170
JPW Ruby 1	400	Very pretty but pricey luxury metal-cone miniature has good, if slightly edgy balance	19,32,21	●	87	6 55	●	1572 139
JPW Ruby 4	1,000	Twin metal-cone main drivers improve the dynamic performance and bass extension, with little sacrifice in focus precision	22,94,26	●	88	8 25	●	174
KEF Coda 7	129	Lovely open voice reproduction, but bass could be tauter; build tougher	18,30,23	●	88	6 50	●	1783 156
KEF Coda 8	189	Outstandingly well-balanced, bass is deep but a little vague	20,32,5,29	●	86	6 28	●	1784 156
KEF Coda 9	299	Uneven budget 3-way floorstander with poor bass definition	20,86,28	●	89	6 30	●	1785 156
KEF RDM One	499	Cute and tiny, nice midband but lack of bass warmth and weight	23,30,24	●	88	6 70	●	164
KEF Reference Model 2	1,599	Classy, large floorstander that has massive headroom and clean mid-to-treble, but limited deep bass for size	23,103,34	●	89	4 30	●	167
Kelly KT3	1,200	Super high sensitivity, this hefty floorstander sacrifices smoothness to dynamic realism — to very good effect	25,95,36	●	95	4 28	●	174
Keswick Audio Aria II	379	Confident and dynamic sound, if a little crude and shut in	21,42,24	●	89	8 20	●	1405 148
Keswick Audio Torino	999	Good value, lively contender with distinctive shape and styling. Goes loud and deep but could be smoother	18-26, 93,28	●	90	4 20	●	167
Linn Keilidh Passive	750	Stunning timing and coherence, and awesome bass drive	20,83,28	●	87	4 22	●	1552 138
Linn Kaber Passive	2,000	Dry, bright balance emphasises dynamics and transients, but can sound unforgiving	20,90,28	●	87	4 25	●	118
Mission 700	130	Both in size and sound, a lot of speaker for the money. Good bass weight and extension and goes loud with ease	18,34,26	●	87	8 40	●	179
Mission 731 PRO	140	Cautious balance makes a fine match with budget equipment. A classy baby for smaller rooms	17,5,31,5,20	●	89	8 55	●	169
Mission 750LE	250	Fabulous cosmetics and a great midband carry the day, though size will out and bass is inevitably limited	17,28,27	●	86	7 45	●	177
Mission 733i	330	New tweeter gives this floorstander a more open sound; a good all-rounder that doesn't sound as big as it looks	20,5,88,30	●	88	8 45	●	170
Mission 752 Freedom	578	A beautifully judged compromise in the art of combining presentation with a decent sound, and a lively midband	20,90,25	●	89	8 45	●	174
Mission 753 Freedom	798	Great styling. New, more restrained tweeter reveals fine midband dynamics	21,90,31	●	89	4 40	●	164
Mission 754 Freedom 5	1,298	Tall but exceptionally elegant floorstander gives fine midband projection; goes loud but limited deep bass for size	22,111,31	●	88	4 40	●	167
Monitor Audio Monitor 3	400	An exceptionally discreet floorstander; sonically uneven, it's capable of fine results if used in a sympathetic system	16,91,21	●	88	5 30	●	170
Monitor Audio Monitor 4	500	An oddball balance but a nonetheless entertaining sound, and a good looking real wood box at a realistic price	20,87,24	●	84	6 23	●	177
Monitor Audio MA700 PMC	600	Good-looking luxury compact with all-metal diaphragms, lovely midrange, but occasionally edgy	22,35,26	●	89	8 45	●	1661 152
Monitor Audio 702PMC	700	A good all-round stand-mount with that intimate midband focus which seems the preserve of metal cone main drivers	20,40,25	●	87	8 30	●	174
Monitor Audio MA703 PMC	800	Lovely but pricey floorstander has up-front, coherent 'shiny' sound	20,89,27	●	88	8 50	●	1826 160
Monitor Audio Studio 12	1,000	A real looker, but sound and content are a bit on the small side for the price	17,92,20	●	90	8 28	●	1349 143
Mordaunt-Short MS10i	140	Up front, bouncy and a whole lot of fun	18,5,30,5,20	●	86	8 50	●	1789 156
Mordaunt-Short MS30i	275	Slightly shut-in and coloured quality is offset by fine bass and impressive communication	25,43,28	●	90	8 28	●	1662 152
Musical Technology Kestrel SE	300	Brighter and drier-sounding than the standard Kestrel (and not the better for it)	20,84,19	●	84	5 50	●	164
Musical Technology Conдор	1,000	Lots of clever ideas in a compact floorstander, which places transparency and smoothness ahead of dynamic drama	25,91,23	●	85	4 28	●	174
Musical Technology Harrier	400	Very pretty package, good measured performance and even sound. Sensitivity is low, and dynamics limp	25,80,23	●	86	8 25	●	1663 152
Naim Intro	660	Great dynamic range and info retrieval, but thin, lacks warmth	24,89,27	●	89	6 30	●	164
Naim SBL Passive	1,970	Lively and punchy — smoother but more upfront than before	27,89,27	●	88	6 25	●	1352 143
Neat Mystique Mk2	575	An elegant package which delivers a fine overall sound quality; some might find the top end too insistent	20,86,18	●	85	6 23	●	177
Neat Petite II/Gravitas	2,000	Beautifully presented miniature/subwoofer combo with ribbon tweeter gives smooth, laid-back sound	23,105,40	●	85	6 25	●	167
Origin Live Conqueror	1,650	Chunky floorstanding 3-way has lovely cabinetwork and lively sound, but limited deep bass	24,94,27	●	88	8 30	●	167
PMC TB1S	430	Pro-audio version of TBI	20,41,30	●	87	6 40	●	177
PMC TBI	410	A classy, laid-back performer that likes going loud and loves the bass guitar	20,40,31	●	87	8 45	●	1830 160
PMC LBI	935	Delightful smoothness and transparency, though bass and treble are both limited	18,53,25	●	89	4 33	●	110
PMC AB1	1,496	Lovely panel-like transparency, slightly shut-in balance, needs a big room	26,79,43	●	89	6 22	●	114
Polk LS50	800	No enthusiast tweaks here, but powerful and beautiful balance	27,83,29	●	89	8 25	●	1155 138
Polk RT16	799	Bass rich, lively and powerful, but suspect top end; big and not very pretty	22,105,39	●	91	4 22	●	1831 160
Polk LS70	1,200	High sensitivity, but balance has too much midbass boom; mid-top is laid back	31,94,37	●	90	8 22	●	1084 132
Proac Response 2.5	2,700	For aspirant high-enders looking for seriously good conventional boxes, this speaker should be first port of call	22,107,25	●	86	8 30	●	1457 149
QLN Signature	1,000	Attractive pyramidal stand-mount with heavy, laid-back balance but remarkably unboxy sound; superb stereo	27,37,36	●	83	4 25	●	167
Quad ESL-63	3,450	Classic electrostatic lacks punch, but has strengths some can't live without	66,93,27	●	86	8 34	●	60
Rega Kyte	198	Has splendid timing and coherence, sounds very explicit and informative	19,31,19	●	87	8 50	●	114
Rega EL8	298	Kyle drivers in compact floorstander gives more bass but less coherence	17,72,20	●	86	8 55	●	122
Rega ELA Mk II	498	Pretty and smooth, the latest incarnation has a superb midband and excellent communicative skills	30,80,20	●	87	8 40	●	1578 139
Rega XEL	1,040	Looks and sounds great: balance bright but even, with delightful coherence and timing	20,82,30	●	89	6 40	●	1083 132
Rehdeko RK 115a	1,700	Single-driver system has limited bandwidth and obvious coloration, but wondrous dynamic and temporal coherence	34,42,27	●	95	8 55	●	167
Revolver Colt	139	A good all-rounder, if a little bland, and excellent value for money	30,19,22	●	88	6 48	●	1407 148
Revolver 250	250	A nice price for a floorstander, but over-bright sound balance has potentially fatiguing consequences	21,85,5,25	●	87	8 22	●	170
RMS Revelation Series 1	1,299	Innovative metal-box compact with integral port/stand — clean with good timing but very laid-back balance	20,99,24	●	81	8 22	●	167

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# HI-FI LOUDSPEAKERS (CONTINUED)

SIZE WxHxD(CM) SENSITIVITY(dB/W) IMPEDANCE(Ω) BASS FROM (Hz) FACTSBACK NUMBER CLOSE TO WALL FREE SPACE ISSUE NUMBER

Product	Price(£)	Comments	SIZE WxHxD(CM)	SENSITIVITY(dB/W)	IMPEDANCE(Ω)	BASS FROM (Hz)	FACTSBACK NUMBER	CLOSE TO WALL	FREE SPACE	ISSUE NUMBER
Rogers GS1	179	Classy looking small box with equally classy, if slightly over cautious sound	19,30,17	85	8	45	●			179
Rogers dB101	250	Style par excellence, this shapely sub-miniature is fast and agile but lightweight and forward: great voices; lacks bass	20,26,20	88	6	45	●			170
Rogers LS3/5A	699	Clever AB1 stand/subwoofer helps the classic 3/5A monitor give its best shot	19,31,17	82	12	45	●			1354 143
Rogers C6/28	1,399	Large floorstander with carbon-fibre tweeter. Sounds much better than it looks, especially through the midband	25,103,29	88	6	20	●			167
Roksan ROKone	595	Large stand-mount is musically very communicative if a little coloured	21,45,33	89	6	30	●			1834 160
Roksan Ojan 3 Black	795	Squat, stylish and black, great bass extension and somewhat uneven balance	28,76,46	88	8	20	●			1082 132
Roksan OJ3X Black	995	Innovative low-line, 2-way floorstander with decoupled tweeter; great bass and fine dynamic range	28,79,46	84	8	20	●			167
Royd Minstrel	275	Not much wellie or loudness but fine coherence and timing, a bit bright	18,69,12	86	8	30	●			1167 135
Royd Doublet	485	Great value compact floorstander; lively and very informative, if a little uneven	18,93,19	90	4	28	●			1835 160
Royd The Sorcerer	595	Extremely musical and communicative speaker that's fun to listen to. Aesthetics could be better, though	20,31,18	86	8	35	●			139
Royd Abbot	695	Dynamic and fine transient qualities are hampered by a rather coloured mid-forward balance	20,81,30	90	8	43	●			118
Ruark Sceptre	599	Graceful 'traditional' cabinet with classy veneer and shiny gilt fixings, hampered by a rather wayward sound balance	21,38,31	87	8	40	●			174
Ruark Talisman II	749	Less ideologically committed than some, strength lies in fine all-round coherence	23,84,32	88	8	30	●			118
Ruark Crusader	1,599	Elegant luxury 3-way with wonderfully even-handed, if rather laid-back balance	24,94,31	85	6	22	●			167
Ruark Equinox	1,849	The primary strength of this speaker is its ability to vanish behind the music	25,88,34	88	6	45	●			1227 140
SD Acoustics SD3R	649	New SD3 has the agility and charm of a quality miniature, good bass and low sensitivity	20,38,30	87	8	25	●			106
SD Acoustics SD5	1,549	Bass suspect but forward midband is delightfully smooth. Has ribbon tweeter	20,110,30	88	8	30	●			1081 132
Sequence 400	329	Clever hang-on-wall panel is well voiced, though bass isn't too great	25,100,7	86	8	45	●			164
Shahinian Arc	1,875	Occasionally wonderful small floorstanding omni; bright but coherent and revealing	35,69,25	88	6	24	●			110
Silverado Raider	695	Beautifully built audiophile compact, neutral if bright, tough work for amps	20,40,25	83	3	30	●			164
Spendor 2030	599	Discreet slimline floorstander with delicately coherent, laid-back sound	18,89,27	87	8	30	●			1836 160
Tangent Monitor 5	80	An uneven performer best suited to small rooms and generous volume levels	17,5,27,18	83	8	55	●			169
Tangent Monitor 9	150	Budget floorstander that can motor when the music demands with a solid bass but occasionally raw treble	19,5,75,5,22,5	90	6	45	●			165
Tannoy Mercury M1	120	Sounds much bigger and more expensive than it is. Solid, tuneful bass, wide open soundstage with excellent imaging	17,30,20	87	8	50	●			179
Tannoy Mercury M2	140	A fine all-rounder with big box and deep bass for the price; could be sweeter and tighter	20,5,38,28	87	8	25	●			169
Tannoy Mercury M3	230	Good-looking fine value floorstander is very neutral and evenhanded, with fine midband but weak dynamics and drive	20,5,87,28	87	7	20	●			170
Tannoy Precision P20	400	A creative and attractive design with time-aligned drivers, but the sound lacks sufficient excitement.	21,80,30	88	5	25	●			177
Tannoy D300	999	Gorgeous-looking compact floorstander. And a fine all-round performer too	16-24,85,23	87	6	26	●			167
Tannoy D500	1,999	Plenty of muscle and stereo, but short of poise and delicacy. Hard work for amps	31,93,34	91	6	20	●			1355 143
Tannoy Westminster TW	6,600	These awesome horn-loaded speakers are remarkably controlled and impressive	large	99	8	38	●			C93
TDL RTL3SE	450	A touch of boom'n'tizz might be to taste, but this is a lot of box for the money, with floor-shaking bass capabilities	20,91,39	89	6	22	●			174
TDL CF200 Cotswold	650	Fine midband tonality and dynamic range, but less happy towards the bandwidth extremes	22,5,78,23	86	6	40	●			177
TDL T-Line 3	700	Plenty of bass and treble, but broad midband is rather repressed	20,97,38	86	8	20	●			164
Technics SB-M20	200	Well-balanced with natural perspectives and fine midband coherence, but bass is a bit boxy and uneven	20,32,23	70	8	50	●			1413 148
Technics SB-M500	450	This model offers a clean, open sound, offset by midbass, heavy balance and low sensitivity	25,78,37	85	8	25	●			1666 152
Totem Model One	1,195	Utterly delightful but exasperatingly expensive luxury miniature sets the benchmark for its size	17,31,23	87	4	28	●			122
Vandersteen 2Ce	1,395	Elegant staggered baffle contributes to a refreshing freedom from boxiness	41,101,27	88	7	23	●			86
Wharfedale Diamond 7.2	140	A good-hearted, lively and up-front performer that's a little lacking in subtlety and smoothness	19,29,5,23	88	4	45	●			169
Wharfedale Valdus 400	200	Goes very loud with a minimum of amplification, but the sound is very thick and uneven, with a heavy upper bass	25,80,26	91	8	30	●			1414 148
Wharfedale Valdus 500	300	These rock boxes can move plenty of air, albeit not as subtly as alternatives	25,108,26,5	91	4	40	●			1758 155
Wharfedale MFM-3	350	Smooth broad midband gives fine voice rendition; bass could be better	22,89,28	87	8	40	●			164
ZYP AI	199	Cute metal cased micro-miniature is quite coloured but great fun	14,22,12	88	8	30	●			110

## SUBWOOFERS

Acoustic Energy AE108S	299	Lots of loud subwoofer for your money, though ultimately more film than music oriented	50,42,43			20	●			179
B&W ASW1000	499	Very competently engineered all round, and goes (unnecessarily) very loud	54,47,48			20	●			179
B&W AS6	500	Good material value with a fair amount of low bass from 100W active design	45,51,45,5	●		30				1736 154
Celestion CS135	139	Compact hideaway passive sub lacks deep bass for high sensitivity speakers	52,19,34	●	86	8	45	●		128
Jamo SW600	530	Has some neat styling touches and remote control but deep bass is limited (active)	38,41,53	●		30				1736 154
JPW SW60	349	A real heavyweight for 349, sounds clean and transparent, if perhaps a little understated. Usefully flexible	55,47,39			20	●			179
KEF Model 30B	499	Commendably discreet with good sense of timing but limited extension (active)	38,5,37,43	●		45				1736 154
KEF AV1	2,499	Works well, looks great, shakes the windows but costs a lot and is bulky	56,43,50	●		45				128
M&K VX-7B	450	Baby of a big range; this active design delivers deep, plentiful bass but lacks transparency	35,25,37	●		40				1736 154
M&K MX70	900	Justifies its cost and belies its diminutive size, with an agility that makes sense of the toughest material	25,5,46,35			25	●			179
REL Q50	375	Genuinely deep, clean bass from an attractively compact and cost effective package	40,41,42			20	●			179
Rogers AB1	549	Subwoofer-cum-stand designed as partner for LS3/5a or similar miniatures	19,57,16	●	82	8	●			1354 143

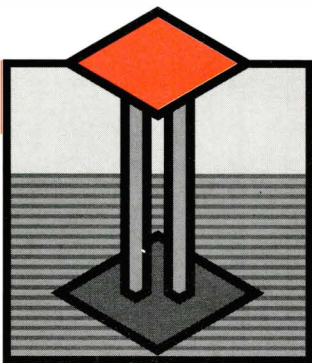


# DON'T RISK MISSING AN ISSUE! SUBSCRIBE TO HI-FI CHOICE — TURN TO PAGE 46 FOR FULL DETAILS



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# HI-FI CHOICE



## Stands & Supports

**H**i-fi furniture is more important than you might imagine. The effect it can have on the sound of your system is far from subtle. Hi-fi furniture can be split up into two categories — equipment supports and loudspeaker stands. Though this branch of hi-fi is less governed by vigorous science than, say, amps and CD players, extended listening has proved that stands and supports do sound different — and make a difference to the

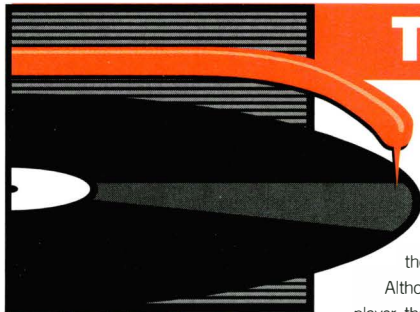
sound of the components that are placed upon them! Speaker stands come in a variety of sizes and styles to suit different models. Use dealer or manufacturer recommendations to narrow down the choice, but as a rule you want the tweeter at ear height.

**B** Best buy **R** Recommended

KEY	HEIGHT (CM):	TOP PLATE SIZE (CM):	FILLABLE:	lead to increase mass, which affects sound.	WELDED:	NUMBER OF SHELVES:	rack or support.	SHELF TYPE:	FACTSBACK NUMBER:	copy of the review. Use the contents page to find the Factsback information page, elsewhere in this section.	ISSUE NUMBER:
	Height of stand or equipment shelf	Dimensions of top plate on speaker stand or equipment support.	Some speaker stands can be filled with sand and/or		The better stands and supports are welded rather than bolted together.	The number of tiers on an equipment		Material from which shelves are made. Wood generally means MDF.	The Factsback reference for ordering a fax		The issue of Hi-Fi Choice in which the original review appeared.

STANDS & SUPPORTS			TOP PLATE SIZE (CM)	HEIGHT (CM)	FILLABLE	WELDED	NUMBER OF SHELVES	SHELF TYPE	FACTSBACK NUMBER	ISSUE NUMBER
Product	Price (£)	Comments								
<b>Equipment Supports</b>										
Fi-Rax R4	399	Lively, exuberant sound, slightly weak bass					5	Glass	1633	151
Frameworks H500/H175	404	Two-shelf stand and isolation platform combo in tubular steel that made a spectacular impression on audition	70	52,34			3	Glass	166	
Mana Acoustics Ref. Table	350	King of its type, angle iron, chipboard and glass combine to make a significant difference to sound quality					1	Glass	147	
Mana 5 Tier Sound Table	600	Infinitely upgradeable. Persuasive and thrilling glass and angle iron design that adds speed and bandwidth to components upon it					5	Glass	1633	151
Optimum Int 2000 OPT490	299	25kg stand with shelves sandwiched between variable height tubular uprights. Sounds smooth and relaxed with sturdy bass	50	60,40			4	Glass	166	
Quadraspire Q4	250	Easy to live with, and tonally neutral					4	MDF	1633	151
Sound Organisation Z038	135	Too lively and lacking order — but cheap	50	84,40			5	Wood	1633	151
Sound Organisation Z560	160	A mix of welded and bolted members gives good structural integrity. While performance is not up with the best, it's great value	90	46,36			5	Wood	166	
Soundstyle Select 6105	300	Respectable sonics, structurally solid and smart					5	Glass	1633	151
Soundstyle Finewoods W105	320	Veneered shelves clamped between tubular uprights that delivers with classical material	82	48,27			4	Wood	166	
Stands Unique Sound Tower	289	Wooden uprights combine with glass shelves to provide a fresh, forward sound, but bass could be quicker	81	72,42			5	Glass	1633	151
Target B5	175	Free of colorations, fine grip and good value					5	Wood	1633	151
<b>Speaker Stands</b>										
Alphason NC I	45	Filled single-column design without threaded spike holes that's appropriate for non-critical applications	40-60	16,16					1373	146
Alphason NCII	84	Tall, slim and elegant, though sound and value are unexceptional	40-60	17,17					159	
Alphason Titan	125	Excels in the midband and allows voices to come across in a detailed and expressive fashion	40-60	16,16					1373	146
Apollo AZ6	80	Fine engineering value, but sound is unexceptional and top-plate small	66	15,13					159	
Atacama BD21	55	Good-looking and good value, but doesn't match the SE24's sound quality	56	15,17					159	
Atacama SE24	70	Stands out from the budget crowd because of the consistency and overall quality of the performance	61	19,5,17					1373	146
AVF Tower 400	35	Ridiculously cheap and much better than no stand at all	54	17,20					159	
Kudos S50	100	Better sound than the budget stands, particularly at the bottom end	60	15,21					159	
Kudos S100	270	The best all-round stand around... Probably...	63	15,21					159	
Mana Soundframes	125	For use under floorstanders and equipment racks, these make music effortless and natural, can be stacked for greater effect	5						1373	146
Revolver RS1	70	A good blend of performance and appearance for the price	53	18,18					159	
RMS/Stands Unique Vivus	349	Pricey carbon fibres give ultra-clean sound with exceptional voices	50	N/A					159	
Stands Unique HP	220	Real wood disguises high performance tuned technology	59	22,23					159	
Target R1	280	Truly high-mass four-pillar design with superb weight and speed, giving music delicious attack and outstanding imagery	53	15,21					1373	146
Target TR60	68	Lively, dynamic midrange and detailed treble from a less-than audiophile oriented twin column design	60	15,15					1373	146

# Tonearms



**T**urntables at the cheaper end of the market tend to be supplied with a matching tonearm, and often include a 'starter' cartridge. Still better quality is found at higher prices among the separate motor units and tonearms. Careful partnering and set-up is essential for these components.

Although the turntable is the most important part of a record player, the tonearm is the second most important, and the quality of

its construction and design have a significant bearing on sound quality. There are three basic types of arms listed in the key and each has its strengths, but pivoted designs are the most popular, for reasons both practical and economical.

**B** Best buy **R** Recommended

**KEY**

**EFFECTIVE MASS:** This relates to cartridge compliance. Generally high mass arms are suitable for low compliance cartridges and vice versa.

**PARALLEL TRACKING:** An arm which allows the cartridge to

track the disc in a linear fashion.

**PIVOTED:** Arms which allow the cartridge to describe an arc as they traverse the record.

**UNI-PIVOT:** Pivoted arms with a bearing that allows movement in

two planes.

**EFFECTIVE LENGTH (cm):** Length of arm from bearing to cartridge mounting.

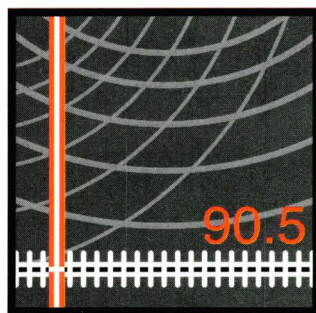
**ADJUSTABLE HEIGHT:** Important for accurate cartridge set-up.

**FACTSBACK NUMBER:** The reference for ordering a fax copy of the review. Use the contents page to find the Factsback reference.

**ISSUE NUMBER:** The issue of *Hi-Fi Choice* in which the original review appeared.

## TONEARMS

Product	Price (£)	Comments	PARALLEL TRACKING	EFFECTIVE MASS	PIVOTED	UNI-PIVOT	EFFECTIVE LENGTH (cm)	ADJUSTABLE HEIGHT	FACTSBACK NUMBER	ISSUE NUMBER
<b>Kuzma Stogi Ref</b>	1,250	Large, solid and well-made arm, gives exceptionally clear sound with just a hint of brightness	High	●	●	●	●	●	79	79
<b>Linn Ekos</b>	1,500	Superb, state-of-the-art design which builds significantly on predecessor's strengths	Medium	●	●	●	229	●	67	67
<b>Moth Arm</b>	95	The ultimate budget arm? Refined, sweet, detailed and natural	Low	●	●	●	237	●	60	60
<b>Rega RB300</b>	174	Despite its modest price it sets exceptional standards and could be used on many high-end turntables	Low	●	●	●	237	●	60	60
<b>Roksan Tabriz Basic</b>	275	Targeted at the Xerxes, this is a good alternative to the Rega arm in many cases – a touch bright though	Low	●	●	●	240	●	91	91
<b>SME Series IV</b>	983	Superb engineering and finish with a finely balanced sound, impressive stereo focus and low coloration	Low	●	●	●	233	●	60	60
<b>SME Series V</b>	1,461	Excellent in all respects, this arm arguably sets the standards for pivoted arms, regardless of price	Low	●	●	●	233	●	60	60



# Tuners

**T**he radio medium may have a lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live concerts rival all other sources from a hi-fi perspective.

Though tuners might seem something of a hi-fi afterthought, the task they discharge is far from simple, since it requires the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on reception conditions, unless you get radio via cable, but a high-quality aerial system is well worth having. Tuners come in two basic

types. Analogue models tune gradually and can have analogue or digital displays; they are often preferred for sound quality. Digital tuners offer convenient automatic tuning facilities and pre-set memories.

**B** Best buy **R** Recommended

**KEY**

**WAVEBANDS:** Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for receiving certain transmissions in the UK.

**PRESETS:** Number of station frequencies that can be stored.

**RDS:** (radio data system) was originally designed for in-car

applications. Basically RDS tuners can identify and display the name of the radio station being received, as well as prioritising traffic announcements.

**REMOTE CONTROL:** Couch-potato friendly.

**SIGNAL STRENGTH METER:** Indicates strength of signal from

aerial, useful for aligning your 'twig' during installation

**ROTARY TUNING KNOB:** Experience has shown that this analogue throwback is ergonomically far superior to the button-based approach.

**FACTSBACK NUMBER:** The Factsback reference for

ordering a fax copy of the review. Use the contents page to find the Factsback information page, elsewhere in this section.

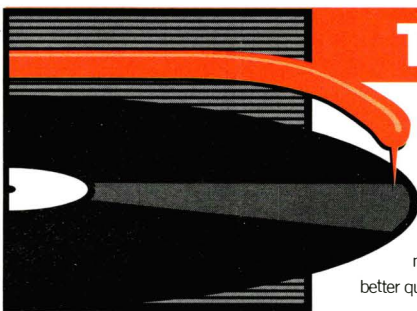
**ISSUE NUMBER:** The issue of *Hi-Fi Choice* in which the original review appeared.

## Tuners

Product	Price (£)	Comments	WAVEBANDS	PRESETS	RDS	REMOTE CONTROL	ROTARY TUNING KNOB	SIGNAL STRENGTH METER	FACTSBACK NUMBER	ISSUE NUMBER
<b>AMC T7</b>	130	Performance adequate but price is sharp, especially with remote control. Some hum	FM, M	30	●	●	●	●	166	166
<b>Arcam Alpha 7</b>	230	Indifferent RF performance but a touch of audiophile sound quality with clean, strong signals	FM, M, L	24	●	●	●	●	166	166
<b>Arcam Delta 280</b>	300	Fine sound quality marred by mild synthesiser whine; RF performance only average. Remote £60 extra	FM	20	●	●	●	●	120	120
<b>Audiolab 8000T</b>	800	Unusual combination of fine sound quality and RF performance (inc AM), and superb ergonomics	FM, M, L	39	●	●	●	●	1254	142
<b>Denon TU-260L</b>	120	Careful minimalist design promises a surprisingly open and vivacious sound	FM, M, L	20	●	●	●	●	93	93
<b>Denon TU-425RD</b>	200	A fine all-rounder with advanced RDS, good RF performance and decent sound. Remote extra	FM, M	40	●	●	●	●	166	166
<b>Harman/Kardon TU950</b>	200	Bulky but effective, delivering fine RF performance and good sound for the price	FM, M, L	30	●	●	●	●	166	166
<b>Linn Kremlin</b>	2,600	Controversially good sound at a very high price. The reviewer's saving up but you should check it out for yourself	FM	80	●	●	●	●	1254	142
<b>Magnum Dynalab FT101</b>	825	Although fairly expensive given its minimum set of facilities, its excellent sound provided ample compensation	FM		●	●	●	●	72	72
<b>Micromega Tuner</b>	750	Has digital output but even without the Micromega DAC, this provides exceptional sound quality. Looks good too	FM	39	●	●	●	●	1810	157
<b>Mission Cyrus FM7</b>	400	Open, generous soundstaging gives the music plenty of foundation, if a touch shut-in at the top	FM	29	●	●	●	●	1254	142
<b>Musical Fidelity E50</b>	300	Sounds involving if coloured and with a subjectively larger-than-life presentation	FM	20	●	●	●	●	1810	157
<b>Naim NATO1</b>	1,730	There may be better sounding tuners in the world, but we have yet to hear one	FM		●	●	●	●	1254	142
<b>Pioneer F-504RDS</b>	250	Cable-friendly with advanced RDS and excellent RF performance, slightly disappointing sound	FM, M	40	●	●	●	●	166	166
<b>Rotel RT-935AX</b>	160	Good ergonomics and sound quality at a realistic price, but limited features and RF selectivity	FM, M	20	●	●	●	●	166	166
<b>Sony ST-SA3ES</b>	250	Clean, lean presentation but needs a quality aerial to perform at its best	FM, M, L	30	●	●	●	●	1810	157
<b>Technics ST-GT350L</b>	130	Decent RF performance is offset by sound quality more typical of a mini/midi system	FM, M, L	30	●	●	●	●	1254	142
<b>Thorens TRT2000</b>	499	Not exactly neutral sounding, it nonetheless makes listening fun	FM, M	59	●	●	●	●	1810	157



# Turntables



**S**pecialist turntables are what high fidelity sound is all about. CD players may offer silent backgrounds 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 tend to be supplied with a matching tonearm, and often include a 'starter' cartridge. Still better quality is found at higher prices among the separate motor units

**Best buy**

**Recommended**

**KEY**  
**MANUAL:** You do it all: put the needle on the record and take it off.  
**AUTO:** The record player does it all.  
**SEMI-AUTO:** Share the work: you put it on, it lifts it off.  
**SPEEDS:** In RPM to correspond with your platters.  
**SUSPENDED SUBCHASSIS:** Sprung suspension to minimise structural interference.  
**EXTERNAL PSU:** Outboard power supply, generally indicative of higher-quality performance.  
**SUPPLIED WITH ARM:** Many turntables require a separate arm to be fitted; if not, this tells you so.  
**SUPPLIED WITH CARTRIDGE:** Most turntables do not come supplied with a needle.  
**FACTSBACK NUMBER:** The Factsback reference for ordering a fax copy of the review. Use the contents page to find the Factsback information page, elsewhere in this section.  
**ISSUE NUMBER:** The issue of *Hi-Fi Choice* in which the original review appeared.

## TURNTABLES

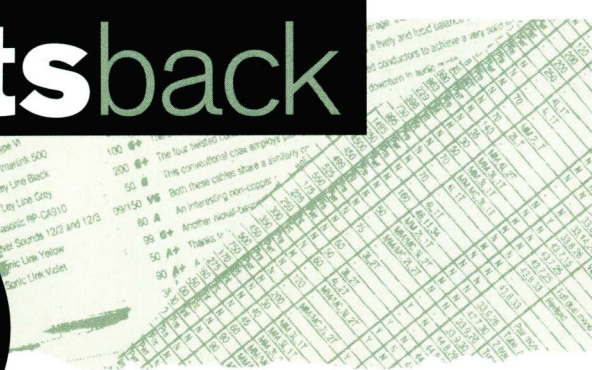
Product	Price(£)	Comments	MANUAL	SEMI-AUTO	SPEEDS	SUSPENDED SUBCHASSIS	EXTERNAL PSU	SUPPLIED WITH CARTRIDGE	FACTSBACK NUMBER	ISSUE NUMBER
Clearaudio Reference	3,990	Opulent beast tested with Souther TQ-1 arm. Tends to gloss over detail with a fizzy character but is quite bold	●		33/45					1328 144
DNM Rota 2	5,600	Tonally slightly bleached, but extracts detail like few others. Works well on its own table	●		33/45					1328 144
Dual 505-4 UK	250	Consistent sounding and well isolated turntable. It is slightly lacking in oomph		●	33/45					103
Kuzma Stabi/PS	1,950	(Tested with Stogi Reference) Solid oak plinth; sound is very clear, detailed and extended	●		33/45					91
Linn LP12 Basik	1,100	Trails the full LP12 significantly, but pace, rhythm, timing etc still top rank	●		33					103
Linn LP12 Lingo	1,750	The classic reference is improved by the Lingo, but charming character remains	●		33/45					91
Michell Gyrodec	875	Sweet and natural-sounding player, well matched to Rega RB300 arm	●		33/45					55
Moth Kanoot	329	Rather coarse-sounding deck that requires decent isolation and comes with a Rega RB300 arm	●		33/45		●			164
Notts Analogue Spacedeck/Arm	750	No frills, just a first-rate, outstandingly natural-sounding deck that will last forever	●		33/45		●	●		159
Pink Triangle Anniversary	2,500	Possibly the most detailed, clear and neutral-sounding deck around. Likeness to master tape is uncanny	●		33/45					91
Pro-ject 2	300	Remarkably effective at the price with decent timing and a generally well defined sound	●		33/45			●	●	164
Pro-ject 6/Sumiko	850	Don't think of this as a mid-price deck with a good arm, but as a scaled-down Oracle Delphi – it's that good	●		33/45					138
Rega Planar 2	214	A remarkable product at the price, surprisingly articulate and confident	●		33/45			●		48
Rega Planar 3	274	The '3 sounds musical in a balanced and coherent manner, needs decent isolation and suffers a little pitch instability	●		33/45					164
Reson RS1	600	Supplied set-up and ready-tuned, this unconventional deck is packed with mid-band detail	●		33/45			●	●	159
Roksan Radius 3/Tabriz zi	890	Elegant-looking turntable with a tidy, ordered sound. Bright and breezy if a shade lightweight	●		33/45					159
SME Model 20A	4,863	Supplied with Series V arm. Engineered to last a lifetime, giving excellent stereo and detail retrieval	●		33/45/78					118
Thorens TD166 W/UK/RB	400	Refined and solid sound with well-focused imagery; suitable for use with good MM and budget MC cartridges	●		33/45			●	●	103
Thorens TD2001	700	Balances convenience and sound well, but deck lacks detail and bass could be better controlled		●	33/45					159
Well Tempered Record Player	1,850	Intriguing and challenging. Musically it is not ideal, but has a limp quality and a lack of artificiality that sets standards	●		33/45					1180 136

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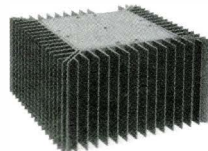
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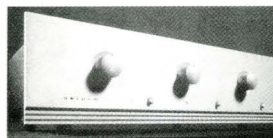
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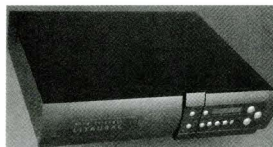
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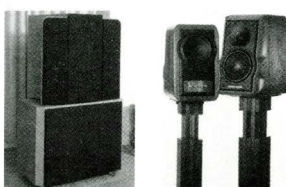
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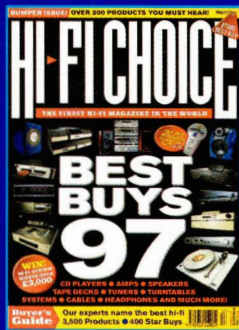
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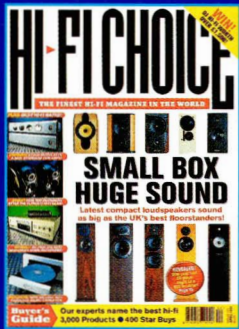
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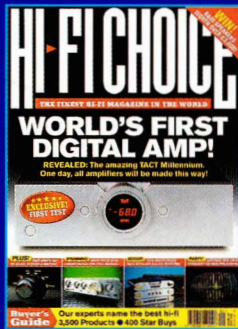
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**THE JULY/AUGUST 1998 EDITION OF HI-FI CHOICE WILL BE ON SALE THURSDAY JUNE 11, 1998. DON'T MISS IT!**

# Ultra Vivian Scene

Thanks to JBL, David Vivian's wife has a new pet. But will this new electronic gizmo allow them to live in perfect Harmony?

**D**iane, my wife, is susceptible to new pets — we have six cats, a chinchilla and numerous goldfish. No doubt there are other furry creatures loafing about the house, too; I've just watched *Men In Black* on video and it all looked strangely familiar. But I digress. When my younger daughter Emma, who's seven, got her first Tamagotchi (cyber pet), Diane quickly adopted it and nursed it, day and night, until it was 94. This is good, as it means she's capable of having a meaningful long-term relationship with a bunch of microchips.

She hates hi-fi, though. Or rather, she loathes the idea of it. Every time another delivery van pulls up outside the house and disgorges cardboard boxes, Diane jumps up and down on the spot yanking at her hair. Like most hi-fi reviewers, I've got more equipment than an Everest expedition and the kind of cardboard stash you normally only see in Safeways' back yard. Hi-fi's all over the house like a technological rash.

Diane doesn't like any of it — it's too black and it's too big, and it makes the house look untidy. Sounds OK, though. Sounds good, in fact. Being well-adjusted people (ha!), we both love music. But that's no justification for hi-fi being so big, ugly and unsightly. It has an inner beauty, I insist — an all-embracing goodness that transcends its physical shortcomings. Bull, says she.

Hmmm. No hope, then. Well, no. But JBL has shown Diane an alternative reality that has ignited a fantasy, which has, in turn, cooled the heat on me. The fantasy is that the hi-fi I love and understand — the big metal boxes, the twirly cables, the industrial-strength support tables — is actually redundant. The alternative reality is something called a JBL Harmony, and since it arrived a couple of months ago, it has become a household pet, our seventh cat if you like. Most of the time, it sits on the sideboard. Diane strokes it every time she passes.

You see, the Harmony is small and cute; much smaller and cuter than you'd ever imagine from the photographs — yet rather heavier. This is a good sign; it smacks of quality. It's dark grey with a green display — the same fur/eye colour scheme as our eldest cat, Joe.

And, of course, it plays music. Radio One in the mornings, Radio Four in the afternoons, CDs in the evening. We could carry it up to the bedroom and it would wake us up in the morning, because it has two alarms. We could use it in the car or the great outdoors (as well as a detachable AC cord for a wall plug, the Harmony comes with a 12V car cigarette-lighter adaptor, and a rechargeable four to six-hour battery pack).

ply wouldn't stick its badge on something that didn't sound half decent. Diane recognised the Harmony's sonic talent straight away — she's accustomed to high-quality listening, so had the Harmony fallen too far short of what she's used to hearing, it wouldn't have been so exciting.

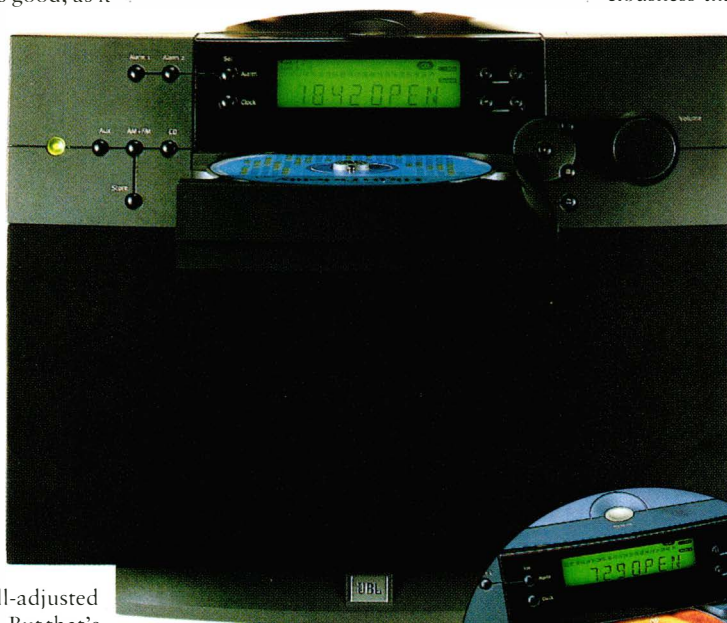
In a word, the Harmony sounds BIG. Far bigger than seems possible. It has real bass weight and extension, and a sense of spaciousness that extends way beyond its own modest boundaries. Partly, this is down to its solid construction, and partly the beefy drivers concealed behind the cloth grille. Two eight-cm mid-high frequency units are driven by 20 Watts of amplification, but the 12cm 'subwoofer' (OK, it's just a woofer) gets its own 20 Watts amp. Frequency response is a claimed 60Hz to 20 kHz (-6dB). There's undoubtedly some sort of stereo enhancement electronic gizmo at work somewhere, to widen the soundstage, but JBL doesn't say what it is. Doesn't matter — it adds a degree of dimensionality to the sound without any unwanted phasey effects.

Moreover, the thing's bomb-proof. The last notch on the volume scale is as loud as it will go. And, believe me, that's loud. At a pinch, you could party with this thing.

It's a sort of miniaturised Ministry of Sound. You've just got to take a little care over where you place it. The Harmony has enough bass output to hack it on a lonely moor in Yorkshire; bung it in a corner, on a resonant piece of furniture, and it will boom. But since treble energy and definition aren't its strong suits, that's the last thing you want.

No, the Harmony isn't proper separates hi-fi. Not high enough to make me want to sideline the heavy-duty hardware, anyway. But Diane would be deliriously happy if I did, then she'd have only Harmony in her life. It would be enough. And all for just £300. It's a thought. ▲

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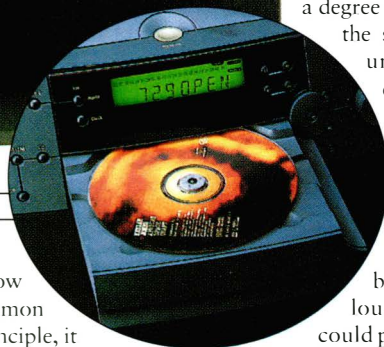


**JBL Harmony**  
Convenience-fi incarnate...

### Harmony's cool, man

I know what you're thinking: how does this differ from your common or garden ghetto blaster? In principle, it doesn't much, except you'd look silly walking down the High Street supporting a Harmony on your shoulder, even if you manage to get the knuckles of your other hand to scrape along the pavement. Ghetto blasters look pants, anyway. The Harmony looks cool, like it's been hewn from a solid lump of granite — spare, minimalist, slightly mysterious. It has a big volume knob and a few buttons, and that's all. The remote, about the size of a Ryvita cracker, allows you to adjust the volume, and it's child's play to use.

What really makes the Harmony work, though — apart from its cuddly appearance, RDS FM/AM tuner, CD player and sheer portability — is the way it performs. JBL sim-



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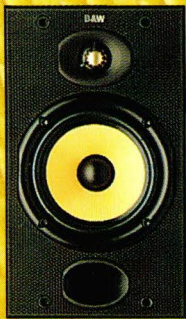
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