

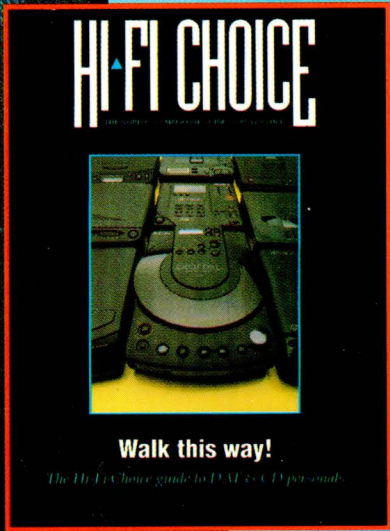
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CARESSED MY COCHLEA. I CAN FEEL IT
NOW, RISING AND FALLING IN A
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HI-FI CHOICE

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Menu

One of the best things about the recent Hi-Fi 91 show was that it gave us a chance to meet the people who read our magazine. *Hi-Fi Choice* put on a series of closed door demonstrations so that visitors could listen to some expensive CD players.

With everything that has been written recently about the differences between bitstream and multibit convertors we thought it might be interesting to let a couple of hundred people listen in to a Meridian bitstream based system and a Wadia multibit system. We'll be reporting on the results of the listening tests next month, but something occurred during them that concerned everyone working on the magazine.

At the end of each session we told the visitors what they'd been listening to and gave them a chance to discuss their impressions. We were happily chatting away and one guy said that he'd heard a consistent difference between the two players, and that he preferred the Wadia by a clear margin. He was, however, very worried about this discovery. He said that this finding didn't agree with what he'd read in the hi-fi press, and that since he expected the Meridian player to sound better there must, therefore, be something wrong with his hearing.

To hear someone doubting their own ears and preferring to take the word of some reviewer is disconcerting. Both the players that we had at the show were quite excellent, as indeed they should be when you consider that both machines cost a lot of money and that Audio By Design had lent us the fabled Audio Note *Ongaku* amp to play them through.

Hi-Fi Choice has always said that it is your own ears that matter as you, not the reviewer, will be the one that has to live with the system. *Choice* has always tried, via our Recommended and Best Buy system, to present a list of alternatives for consideration. Anyone who has experience of hi-fi will know that there is no definitive 'best' loudspeaker at £100, or any other price point for that matter. There are a number of alternatives, all of which are capable of providing good results in the right system, and it is up to you to find a decent dealer who will allow you the time and effort to find which speaker is suited to both your ears and your system. Any hi-fi magazine which resorts to tabloid journalism with screaming headlines proclaiming that such and such a product is the best thing since sliced bread should be treated with the contempt it deserves.

By all means read hi-fi magazines and look at what they recommend, but remember that these are only recommendations and not definitive solutions. Let magazines suggest products to listen to, but trust in your ears to provide the correct equipment for your system.

Andy Benham



Photography by
Chris Richardson

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Update



Yamaha's new CDX-550E relies on S-Bit Plus technology incorporating I-PDM DACs.

PRODUCTS

Natural sound

Yamaha jumps into spring with a whole host of new products... and some new technology.

Apart from amplifiers, a receiver, cassette deck, tuner and subwoofer system, there are five new CD players.

Three of the latter, the CDX-550E, the CDX-750E and the CDX-1050E, priced between £199 and £399, feature Yamaha's new S-Bit Plus - which Yamaha claims is a radical system making the best of one-bit technology. The players use Yamaha's own I-PDM (independent pulse density modulation) D/A converter which includes a second-order noise shaping system to reduce quantization noise as the signal processes from the digital to analogue domain.

A second I-PDM chip ensures greater waveform stability and reduces distortion, while Yamaha's TBC (time base corrector) - a quartz clock - operates to reduce jitter (in the time domain) caused by the calculation process.

Yamaha says the three pronged attack using second-order noise shaping, the new I-PDM DAC and the time base corrector, results in a pure signal output and Natural Sound Reproduction (Yamaha's capitals).

Aside from the S-Bit Plus technology, the players feature eight times

oversampling filters and twin balanced processing with two DACs per channel in normal and reverse phase for low noise. The analogue output is driven through Class A amplification internally.

Partly as a response to the "CDs sound louder" brigade, output levels on these players can be altered by the user to match it with other system components. All the players can be remote controlled and feature headphone sockets with volume control.

Canon on all sides

A new loudspeaker system is due to be launched by Canon Audio Ltd - a newly founded branch of the camera and photocopying company.

The wide-imaging stereo speaker uses a reflector cone atop a cylindrical cabinet to disperse sound waves and is the brainchild of Hiro Negishi working at the University of Surrey Research Park.

Initially the speakers will be made by the Sussex-based specialists Audio Electronics, and Canon Audio hopes to have products on the market by May.

Hi-Fi Choice first reported on the matter in *Update* in issue 60, and since then Paul Messenger discussed the concept at some length in his *Personal Messages* column (see issue 79).

The controversial nature of reflective cone technology means the speakers will have to be auditioned before we could say listeners might

have: 'Canon to the right of them, Canon to the left of them, Canon in front...'

OC all the way for AT

Audio Technica has announced a new range of moving coil cartridges that will replace the AT-F3, F5, OC7 and OC9 MCs. The new OC series cartridges called AT-OC3, 5, 10 and 30 range in price from £89.95 to £599.95 for the AT-OC30, named in commemoration of Audio Technica's 30th anniversary.

All four feature the aluminium body found on the old OCs and the two dearer models have a new micro linear nude stylus profile and gold coated (for damping purposes) tapered beryllium cantilevers. Much

of the technology utilised in the new OC series has been derived from the company's ART-1 flagship model; for instance, all but the cheapest model share its neodymium-iron magnets.

The OC3 and 5 (£119.95) are available now and the OC10 (£299.95) and 30 will be on the market in May.

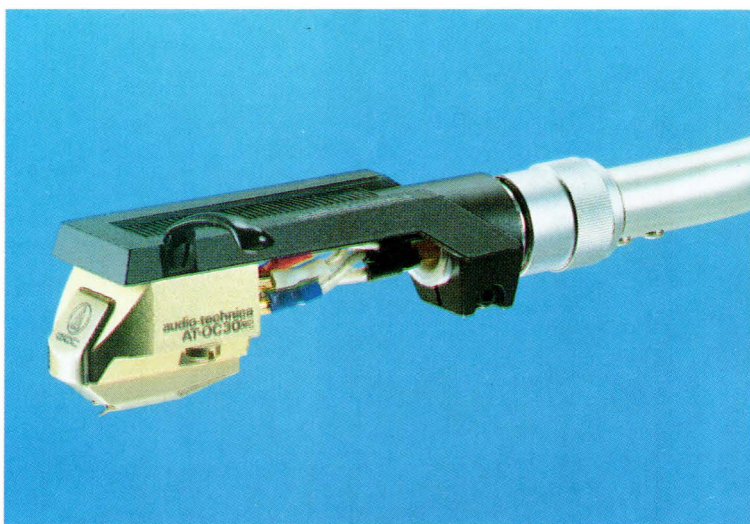
Odysseus arrives

Michaelson Audio is adding to its *Chronos* pre and power valve amplifier combination with an integrated model. Michaelson Audio describes the *Odysseus* valve amplifier as 'visually similar' to the *Chronos* preamplifier's stunning art deco style, reports that it will probably weigh about the same at around 12kg.

A line-level only amp, the *Odysseus* uses the same EL34 valves in its output stages as the *Chronos*, giving a power rating of 40 Watts (into 8Ω) per channel.

No further details were available at the time of going to press, but Michaelson Audio, which is the high-end branch of Musical Fidelity, said the amplifier would be ready by early May.

While the *Chronos* combination costs £10,000 for the pre and two-power amp set, *Odysseus* has a leaner price tag of £990.



Audio-Technica's OC5 moving coil replaces the AT-F5.

BUSINESS

Goodmans buy out

Goodmans is going it alone after several years under the TGI umbrella. In a deal that was signed in early March, a new company - Goodmans Industries Limited - was formed after a management buy out. The firm had been one of the original loudspeaker companies, including Tannoy, which amalgamated to form TGI plc. TGI will retain a 17.5 per cent stake in the new company which is now effectively a distribution base sourcing TGI-made loudspeakers and electronics from the far east.

Managing Director Roger Fearn, who led the buy out, told *Choice*: "It was a mutual decision between us and TGI which wants to concentrate more on manufacturing. We feel confident about the consumer business and over the last five years we have grown a lot. Of course recent profits haven't been so great but my view is that that was a temporary hitch and the long-term viability of the business is good."

The research and development for Goodmans loudspeakers will remain at the TGI base in Havant, Hampshire; Goodmans Industries is planning to move to Portsmouth by the early summer. The research and development for ICE systems, hi-fi separates, midi-systems and portables will be set up in Portsmouth, Fearn added.

"The buy out took ten months," he continued, "which reflects how banks are treating finance these days, and my own money is on the line as well. My feeling is that we have done it in the tough times, so things can only get better."

TGI is also in the news with Tannoy. The brand which is to loudspeakers what Hoover is to vacuum cleaners has won a 1990 Golden Sound Award from the influential Japanese *Stereo Sound Magazine*.



Minimalist amp and matching tuner from Euro-friendly Aura.

PRODUCTS

Mirrored Auras

Another minimalist amplifier and matching new tuner have been launched by Aura. The VA-50 (50 watts per channel RMS) integrated amplifier uses new-design MOSFET transistors in its power stage which are described as 'highly efficient with four almost indestructible output devices'.

The characteristic slim and clean lines of Aura products have been kept with the minimum of controls - just three for volume, input select and tape monitor. But the style has been slightly vamped-up with a mirror-black fascia.

Internally the Aura maintains its British budget audiophile credentials with computer aided design straightline circuitry giving the 'shortest possible' signal paths; Aura says all of the new amp's components were 'carefully selected by audition'. Six inputs, including a

dedicated phono-stage, give a wide range of audio options and of course there is a tape output.

The matching TU-50 FM tuner has been some years in the making. It's a digital FM-only model with 16 memory presets, and has been designed internally with the same straightline concepts as the amps. Aura says the tuner



Carver's CT-6 is a preamplifier and tuner combined, no less.

will be '1992 Eurospec friendly' with high resistance to radio frequency interference from other nearby

electronics such as computers. Design emphasis was placed on stereo separation to get the best from good broadcasts, and a double-tuned detector gives it decent adjacent channel rejection qualities.

However, Aura points out that a tuner is only as good as its aerial and recommends a pukka loft installation or similar for its product.

Both tuner and amplifier cost the same - £199.95.

A box from Revox

Just missing our cassette deck reviews last month, Revox has introduced the H1 - a four motor, three head, solid piece



Revox is making sure that DAT and DCC has some stiff competition with its £1,121 H1 high-end cassette deck.

of Swiss engineering which boasts microprocessor control and computed tape alignment. In fact it appears to incorporate all the salient goodies of its predecessor - the B215. But the H1 is significantly cheaper - costing £1,121 as opposed to £1,727.

It's available in black, titanium silver or Champagne gold and has those tell-tale signs of a product from the upper echelons of the audio hierarchy - lacquered side cheeks.

Cave Carver

Watch out for some slim new products from Carver which has launched its new Profile series featuring Bob Carver's sonic holography system.

A preamplifier, the £395 C-5, and a preamplifier-tuner (as opposed to a receiver), the £530 CT-6, are the first in the series boasting a host of features belying their size - which is only 44mm high. The button-busy models both include remote control keypads, bass, treble and loudness tone controls, balance, a headphone jack and motorised volume control (look no hands!). Both have phono inputs, and two tape inputs. They also feature a Sonic Hologram Generator, Carver's 'fairly' new depth of image system.

The C-5 has two independent outputs allowing dual zone control for multi-room use. The CT-6 incorporates AM and FM automatic and manual digital tuning with charge-coupled FM circuitry for better reception and performance.

Cable talk

Audioquest has updated its F-14 flat loudspeaker cable with a new better sounding type - the F-18. The F-18 cable uses eight isolated strands of oxygen free high conductivity copper with four positive and four negative conductors

lying alongside each other. Audioquest says the cable combines the best characteristics of both multi-strand and solid core designs, and eliminates their main drawbacks.

The cross-sectional area of F-18 gives the quality of most multi strand cables while its isolated strand design minimises interaction and improves mid and treble performance (the strengths of solid core).

F-18 is described as stable with even the most fussy of amplifier designs and is easy to run being only 2 mm thick (by 17.3 mm wide).

It's available in brown or white and costs £2.95 per metre. Arcam, the UK distributor for Audioquest cable, says market research shows customers will gladly spend between five and 20 per cent of their system value on cables, once they realise the benefits in terms of sound quality. Time to upgrade!

B&W at Abbey Road

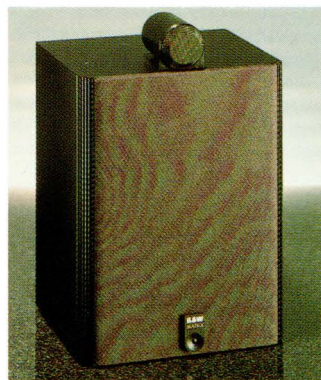
B&W Loudspeakers has launched the *Matrix 805*, a high performance 'near-field monitor' designed especially



Dog-gone: EMI has replaced Nipper, the 92-year-old icon of music recording, with a new world trademark 'EMI Classics'. Nipper's problem was that he could not be used in the USA where 'he' belongs to RCA Victor.

for the EMI Abbey Road recording studios.

The '805, which costs £895, uses B&W's Matrix system - an internal honeycomb structure which gives proven rigidity and damping - resulting in turn in good



B&W's 'Abbey Road' Matrix speakers.

transparency and imaging qualities. The two-way speaker can be stand or shelf mounted.

The 16.5cm mid/bass driver uses a woven Kevlar cone mounted on a rubber surround with a 30mm voice coil. The 25mm metal dome tweeter is ferrofluid cooled and again uses a high temperature voice coil. Both cabinets and grilles have been designed and contoured to minimise the effects of refraction.

Sensitivity is a respectable 90dB while amplifier handling is described as between 50 and 120 watts (into four ohms). Gold-plated terminals allow for bi-wiring or bi-amplification with crossover access. There's even a bass alignment filter for individual room/systems requirements.

The 805 is recommended

Audioquest's F-18 cable is claimed to combine solid core and multistrand advantages.

for use with heavy stands. Custom stands costing £400 a pair and manufactured by Slate Audio are also available through B&W.

This latest speaker completes B&W's 800 Series range and was developed specifically for the EMI studios to complement their existing *Matrix 801* and *802* models.

While built with rock and roll in mind, it is also very much a domestic product and aesthetics have not been ignored - the new model comes finished in a choice of wood veneers as well as the standard black ash.

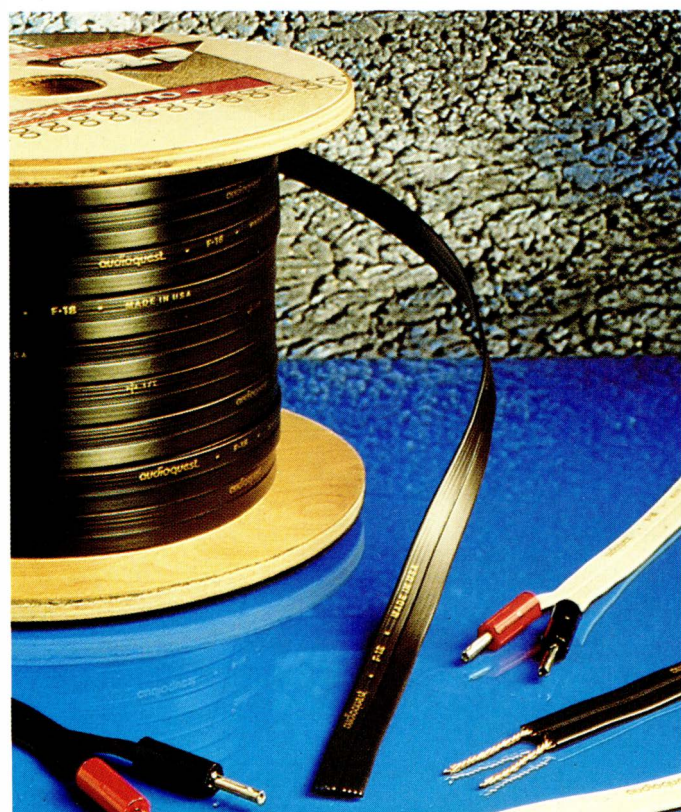
Solid-sunshine-state

Counterpoint, the high end valve hybrid manufacturer from California, has made its first solid state units. In a move which may shock dyed in the wool Counterpoint devotees, a line-level preamplifier and matching power amplifier have been released which contain absolutely no valves.

Counterpoint defends itself (somewhat sheepishly we think) by saying that with careful component choice and complementary circuit topology, a transistor amplifier can be made worthy of the Counterpoint name.

The *Solid 1* and *Solid 8* combo go to the polls armed with advanced FET/Bipolar cascode circuitry and both units are servo DC coupled. The slim preamp *Solid 8* handles eight line sources with two tape inputs. The *Solid 1* offers your speakers 100 watts into eight ohms.

Prices aren't necessarily of the 'if you need to ask you can't afford it' ilk and in the UK should equate to around £800 and £1100 respectively,



although at the time of writing the importer, Absolute Sounds, was unable to confirm the UK prices.

A renewed Infinity

The catchphrase 'designed for the UK market' is applied to the new *Reference Series* range of six loudspeakers from Infinity. Three two-way models and three three-way models priced between £150 and £650 include as standard such features as gold-plated binding posts, bi-wiring facilities and spiked feet.

A better bass character is promised with the new injection moulded graphite woofer offering rigidity and damping which, says Infinity, is superior to damped paper cones. The company has also inverted the dust cap to further reduce cone flexibility and resonance under stress.

The four cheaper models use a polypropylene tweeter which the maker claims eliminates the strident or ringing tone of metal dome types.

The more expensive *RS50* and *RS60* models use Infinity's EMIT-R tweeter which incorporates a low mass diaphragm for optimum frequency response and linearity, and low distortion. The EMIT-R diaphragm and



Choice prize winners landed some acclaimed Rotel separates.

voice coil weigh just 20 milligrams which is some five times lighter than most conventional tweeters, according to Infinity.

Lucky Fellas

We've drawn the names of three lucky winners for the Rotel competition that we ran in the January issue. First prize, a Rotel *Concept 2* CD system incorporating 865 series CD player and tape deck, *RTC-850L* tuner/preamp and *RB-870BX* power amp was won by S Corless of Northampton. Second prize of an *RCD-865* CD player and *840BX4* integrated amp went to MC Rawlings of Saltash and the third prize of *RCD-855* CD player and *820BX4* amp was won by Mr D Dobson of Knutsford.

Classic NAD

A brace of CD players using the Technics MASH one-bit digital to analogue conversion system join NAD's

Classic range this month. The 5420 and 5425 models are priced £169.95 and £199.95 respectively. The difference in price reflects a remote control keypad - apart from that both models are the same.

As part of the *Classic Series* both players promise high grade 'audiophile' components and separately regulated power supplies to

the past establishing new value for money benchmarks in the middle price strata.

This looks likely to be the case with the £298 *Elex* and £730 *Elicit*. Both are simple integrated amplifiers with no frills like tone controls, all the effort directed towards obtaining the best possible sound quality within the constraints of the single box.

The less expensive model has just two controls - the input selector and volume control. Power output is around 35W per channel into an eight ohms load, rising to a little over 60W into four ohms.

The four line level inputs are connected directly to the volume control, while the



Two budget CD players from NAD - including one at £170.

minimise interference from different functions within the player. The use of the MASH DAC is reported to allow a linear output over the whole dynamic range of the CD. Other features include a three-beam laser pickup with powerful error correction, and the ability to play CD singles without an adaptor. Both players are finished in NAD's distinctive slate grey and have the usual non-nonsense ergonomical control layout.

Electoral elicitations

With the introduction of two new integrated amplifiers, Rega Research will shortly be in a position to supply a complete system from source through to speakers.

New products from Rega are both rare and usually highly significant events, in

vinyl disc input comes configured for conventional high output moving magnet cartridges.

Elicit's higher price is due to a doubling of the power output and the inclusion of a moving-coil cartridge input. Inputs are selected by illuminated touch sensors which remotely trigger comparatively costly Reed switches located close to the sockets. Twin transformers maintain layout symmetry and complete dual-mono operation.

Even in the single toroid *Elex*, circuitry is fully complementary and symmetrically arranged throughout, so as to achieve first class common mode rejection and a wide dynamic range.

This is especially important for *Elicit*, which has to combine the high sensitivity moving-coil stage with high power output.



Infinity Reference speakers 'designed for the UK market'.

Below the full range

The highly original and stylish Pentachord five-sided bookshelf loudspeakers now have a new bandwidth extending sub-woofer system on offer.

The new subwoofer uses a single 17cm metal Bandor bass driver to extend the response of the complete system down to 25Hz with the crossover frequency being set at 75Hz.

It comes with an active crossover and requires a separate monoblok (or stereo) power amplifier to give of its best. Pentachord recommends and can supply the £250 Moth 100 but states that any good quality amp with an output of between 50 and 100 watts RMS would be suitable.

The pentagonal cabinet is made of 25mm MDF and forms a 40 litre enclosure. It is attractively finished in natural ash or oak to match the satellites. It measures just 33cm by 52cm and comes complete with gold-plated binding posts and spikes to couple it to the floor are supplied.

For those who thought the 'full-range' Pentachord speakers were expensive enough at £499, it may come as a shock to know the subwoofer costs £550; although both can be acquired for a knock-down £990.



One hell of a coffee table; Pentachord's £550 sub-woofer.

Carry out hi-fi

Hi-fi on the move is promised by Philips with its new portable CD mini systems.

Three systems are available - the £199 Z3, £229 Z4 and £299 Z9. All offer CD, twin cassette deck and four wave tuner sources with the usual features one associates with portables as well as an impressive motorised volume control from the remote handset (except the Z3).

Bose on the move

The new Mercedes SEL series is capable of 0 - 115 at the flick of a switch. We're not talking MPH here, rather SPLs at the driving position.

Look more closely at the new car and those lucky enough to afford the £83,000 asking price will notice a tiny Bose logo on the centre fill loudspeaker built into the rear view mirror.

The new in-car sound system is the result of nearly six years of co-operation and is one of the first to achieve equal sound quality in all four potential listening

positions rather than spoiling those in the front seats while neglecting those in the rear.

The system uses four sub-bass units built into the rear parcel shelf as well as immense tuned cavities built into each door.

You can read all about the system in the *Hi-Fi Choice* in-car supplement, free with issue 96.

SHOW REPORT

Jason Kennedy gives a view of the Bristol Show from the Choice stand

On a crisp sunny weekend last February, Bristol's Holiday Inn played host to the *Hi-Fi Choice* sponsored Hi-Fi 91 show. As well as the fabulous *Choice* digital blind sessions (see our analysis next month) there was a fair selection of new products being put through their paces.

Loudspeakers seemed to feature pretty highly with effectively half a dozen new models making their debuts; effectively because one of them is a reincarnation of an old design. The Snell *K*, *J* and *E* have now become the Audio Innovations *K*, *J* and *E* loudspeakers. As a result of the distributor's (Audio by Design) dissatisfaction with the American company's "updates" of the original Peter Snell designs, it decided to produce the aforementioned models itself. So far the £499 *Ks* and £799 *Js*, the latter with a new undoped mid/bass unit, have seen the light of day. The stands used to support these speakers have also changed somewhat, the original *Pirates* (now no longer in production) have

been replaced by the similar looking, but even heavier, *Huygens* stands from Definitive Audio in Nottingham.

The other new speakers at the show were dramatically varied, undoubtedly the biggest was Naim's £6,000 *NA DBL* mentioned in both *Update* and *Personal Messages* last month, and probably the most diminutive was Celestion's new satellite and sub system. Called *Third Dimension*, this is designed for minimal visibility, the satellites measure a mere 18.5x4.2x3.1cm and contain a Celestion metal dome tweeter, the system costs £189. In between these extremes was a Musical Fidelity *MF50* (£1,400), a shorter version of the *MC6* floorstander. There was a small TDL built NAD floorstander called the *8100* that looks like retailing for around £290, and a £140 JPW subwoofer to go with speakers like the *Sonatas*, but probably quite suitable for other bookshelf designs.

There was also some new Townshend speakers hidden away in the Pioneer room. Called the *Sir David* they cost £1,200 and use the same driver combination as the *Glastonbury* but with the metal mid/bass unit above the tweeter.

Digital distractions

On the digital front, Acoustic Energy was playing a new American DAC called the Audio Alchemy *Digital Decoding Engine*, a relatively tiny piece of equipment that claims 16-bit resolution but uses PDM chips and retails for £398. Apparently it's even adaptable for in-car use. Sony had brought along the latest version of its flagship CD combo, the *CDP/DAS-R1a*, which is now equipped with PLM bitstream DACs but still retails for a hefty £5,000. Audiolab had an early sample of its *8000D D/A* converter but was reluctant to own up to the conversion technology utilised, so you'll



Philips is making three new sub £300 yuppie-blasters.



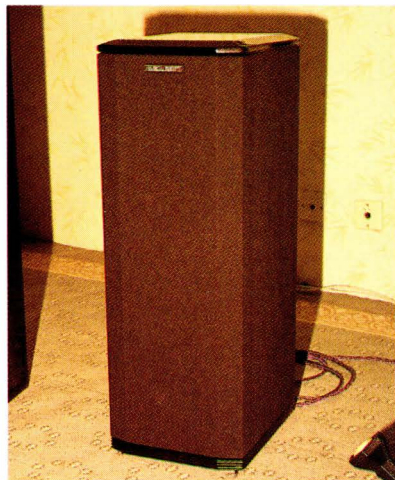
At the Bristol Show, Celestion revealed this diminutive £189 satellite and sub system - just the thing if you don't want big speakers cluttering up your room.

have to wait until you hear it before you decide what it sounds like! Price is going to be in the region of £600.

Dolby S finally sprang into life with two remote control decks from Harman/Kardon, the two head TD4600 (£600) and three head TD4800 (£1,000) and, believe it or not, an £800 model from Arcam. This is the first British domestic cassette deck since the Neal (anyone remember that?), and looks like a serious beast, it's much higher than usual and features the aforementioned S type noise reduction, three heads, dual capstan drive and remote control.

New amplification wasn't exactly abundant, Ortofon took on distribution of the Albarray range which now includes a £400 integrated model and The Sound Image Stage was making good sounds with its Boulder pre and power amps, beefy US-built black boxes which retail at over £2,500. Acoustic Energy meanwhile, was enthusing about a new contender in the most expensive passive preamp stakes. The First Sound Reference I is a luxurious looking £1,340 unit, however it's almost cheap compared to the £2,000-plus Reference II.

Amongst the other new bits and pieces were some stylish, grey, Nextelesque all-in-one mini systems from Sansui and Sanyo, a couple of speedy moving coil cartridges from Ortofon called MC1 Turbo and MC3 Turbo (£50 and £100 respectively) and a range of almost colourful headphones from Audio Technica. They are called ATH-609, 610 and 611 and cost £30, £40 and £50.



Musical Fidelity MF-50 floorstanding speakers - for a cool £1,400; new headphones from Audio-Technica; and do our eyes deceive us, or is that a British-made Dolby S cassette deck from Arcam?



In Brief

Welling in Kent has a new hi-fi dealer. Volume One deals in specialist brands including Exposure, Nakamichi, Pink Triangle and Royd. Demonstrations are at the shop, 41 Wickham Lane, Welling, or at your home in the evenings. Tel: (081) 304 4622.

The British importing and distribution company Zenonlec has been replaced by the forming of two new companies - Heco UK and Monster UK, giving Zenonlec's two main brands a higher profile here and in Europe. Heco UK will now take on the distribution of CEC and Burmester goods.

The Vintage Wireless Company, of Bristol, has published its 1991 audio and radio components catalogue, priced £1.50 (inc post). Details from: Tudor House, Cossham St, Mangotsfield, Bristol BS17 3EN. Tel: (0272) 565472.

There's just no stopping The Audio File of Bishops Cleeve. The chain has expanded to its fourth location in Hockerhill Street with an Audio-Video shop to demonstrate 'through the house' link systems from Systemline and Meridian, and NICAM TV.

Torquay is the setting for a new branch of Radford Hi-Fi, at 6 Fore St, St Marychurch. Three demonstration rooms cater for hi-fi and audio video systems including surround sound and satellite. Tel: (0803) 326723.

Jamo UK (loudspeakers) has taken on the distributorship of Standesign hi-fi furniture in Britain.

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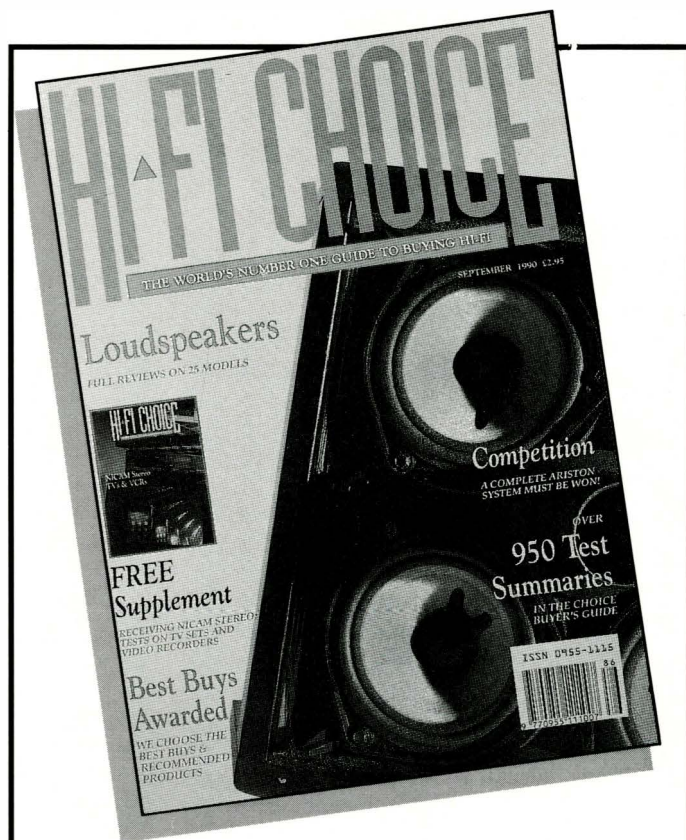
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Chiaki Imada and his wife (right) had their roof extended upwards to accommodate a pair of 3.3 metre-high bass horns. The rectangular gaps in the ceiling, over the wall-mounted horns (above) are the mouths of the giant bass horns.



Japanese portable? This is the stuff you won't find in a high street store. The preamp and channel divider, purpose-built by Japanese transducer guru Seiya Goto, run through a graphic equaliser to American custom-made Sax amplifiers.



The Tokyo steeple effect

Dan Houston and photographer Chris Richardson report from a house in central Tokyo which was partially rebuilt to accommodate a five-way horn speaker system.

People talk about Japanese audiophiles in the same way they must have talked about the pearl fishers of the Orient a century ago. In snippets of conversation you hear about the man who drove a steel girder through two floors of his house and into the ground to ensure a secure platform for his record deck; we know a man who uses a valve amplifier in his three-litre Nissan Cima, and who, even more outrageously, keeps two of the £30,000 Audionote *Ongaku* amplifiers aboard his yacht.

But the Orient is coy about its wealth; the oyster closed on us when we tried to peek at these two pearls, so they remain mythical for now.

On a two week fact-finding trip to Japan in February, we were shown a house which had partly been rebuilt around its owner's aspirational hi-fi system. The house has been extended, with a new steeple roof added to accommodate a pair of 3.3 metre-high bass horns which pierce the ceiling at one end of the listening room. This is an uncommon setup, even by Japanese standards. But the firm which makes it, and which offers an architectural and acoustical service as a package, boasts some 3,000 customers in Japan (and probably as many more fur-

ハイファイチヨイス誌 日本訪問

ously saving up to buy it, if the sound was anything to go by).

House and hi-fi belong to Chiaki Imada, 67-year-old president of the Toei video and cartoon film group, based in Tokyo. Mr Imada lives in the Hakusan district in central Tokyo; the equivalent of London's Belgravia. His two-storey house, which he had built 30 years ago, is typically contemporary Japanese in style, and surrounded by similar dwellings. Mr Imada lives here with his wife - his daughter and four grandchildren live next door.

Over a bowl of green tea Mr Imada told me he had been an audiophile for 40 years, and interested in music since high school days. His extensive record collection, and latterly Compact Discs, Betamax video cassettes and Laserdiscs, allow him to both watch and listen to the great works of Bach, Vivaldi, Mozart, Beethoven and Brahms, by his favourite conductors.

Laserdiscs, or 'LD' since we need an acronym for everything, are now common in Japan, with analogue picture quality and digital stereo sound providing a marriage of audio and visual entertainment. Among the thousands of titles available, many are of classical concerts or operas, and although the NTSC picture quality (the American and Japanese standard) is a trifle disappointing to someone used to PAL (the British and continental standard) it is obvious that



the medium is very popular with discerning audiophiles.

The listening room here is just over six and half metres long by some four metres wide, with a bay and french windows leading to the garden. It is large by Japanese standards and allows Imada to sit between four to five metres away from his system.

Goto great lengths

There are certainly very few steeples in Japan. Mr Imada's was built five years ago when he opted for the no-compromise bass horns which now give him such realistic sound. The horns are part of a five-way Goto loudspeaker system installed by Royal Audio, based in Tokyo. RA markets and installs the systems which are designed and made by transducer guru Seiya Goto at his factory just outside Tokyo. Both RA and Goto have been in business doing more or less the same thing for over 26 years. The RA boss, Masaomi Iwaoka, told me not all Goto systems are as extravagant as Mr Imada's.

Some customers just use individual drive units alongside existing speaker systems, and Goto's cheapest three way speaker set-up costs £800 a pair.

At the other end of the scale, Mr Imada and a few others have shelled out several million yen for their house and hi-fi extensions. The system we were listening to (just the speakers mind you) presented Mr Imada with a bill for eight million yen, of which the bass horns and steeple accounted for five-eighths (or nearly £20,000).

These bass horns are powered by two drivers each; long feeds of Pioneer loudspeaker cable are led up to the drivers in the apex of the steeple. Positioned directly below the openings of the bass horns are a pair of mid-range horns mounted into the wall with drive units concealed. On specially-made high wooden tables the mid-high horn unit and tweeter are positioned side by side, just under the wall-mounted horns to keep the axis and plane outputs of all units close together.

The five-way active system is not quite

truly five-way. The speakers are powered by four stereo power amplifiers with the double drivers in the bass horns fed by one. Mr Imada told me that his new power amplifiers had been designed and made by none other than Doug Sax, the American West-Coast-based recording engineer of Sheffield Mastering Labs fame. The Sax amps are individually powered by lead acid batteries for true isolation from the Tokyo grid. Mr Imada said they were the newest element in the system here and were installed in the autumn. The batteries normally give between four and five months service. Pre-amplification is courtesy of Goto, who makes a passive preamp to cater for the line sources. This makes a dedicated phono stage necessary. Goto also makes a channel divider, effectively an outboard crossover which sits just after the preamplifier in the chain. A Technics graphic equaliser dispels the myth that such additives are bad for your hi-fi, being used in this case to tailor the response from the bass horns.

Source material

Sources are comprehensive; there's even an old reel to reel quarter inch tape deck for Mr Imada's collection of such tapes. He told me it's not used much now. Partly because of his interest in film, and for seeing 'live' performances of concerts, he now uses Betamax tapes and Laserdiscs as well as Compact Discs. His Denon CD player is a 20-bit model which he describes as 'nearly the same sound quality as a one-bit system'. The difference between the sound of this and that of his Pioneer Laserdisc player was negligible he reckoned: "Of course the advantage of LD is the picture," he added, "if a programme is available on both LD and CD then I would buy the LD."

In a 'money no object' system such as this I asked why he hadn't bothered with a DAT machine; he is using a Sony compact cassette player. "I am not interested in DAT," he replied with a look of distaste, "when we record, we record films. I have the CDs already so I just use the cassette system for the car."

For recording off-air, particularly some of the NHK satellite broadcast station's music programmes, Imada favours his Sony Betamax; it is widely regarded as a superior system to the 'better marketed' Matsushita VHS system. "But I'm looking forward to digital VCRs, we should have them in a couple of years' time," he enthused.

Royal Audio has added a new meaning to bass extension.



So how does it sound?

Much of the sound quality of this system is down to the Goto horns. The colossal openings for the bass horns suggest that one would be overwhelmed by sound pressure levels. Quite the opposite is true. Far from noticing bass at all, or treble, or the midrange, or the stereo imagery or any other hi-fi yardstick, it is the natural sound of the system that is immediately appealing. Come and hear a recording of cello on this system and you'll hear a cello.

Imada puts it better: "When the system was first installed I was very surprised. The sound was extremely clean, with very good transient response which is what I look for before something like stereo imagery. The bass is most difficult to describe; it's not punchy but very relaxed. Cone speakers cannot give such a good response - you always have problems with high frequency emission from bass cones which doesn't happen with this system."

While the sound may be superlative, the Goto set-up isn't necessarily for the houseproud; the midrange horns are physically damped where they go through the wall by rolls of flannel, the mid-high and tweeter units look slightly industrial with plasticine-like damping material plastered over them. However the looks don't matter a jot to Imada. He didn't even mind Iwaoka setting up a few dozen empty Kirin beer bottles in the corner to take out standing waves in the room at 190Hz. "It's OK to have all this because the sound is so good; it's good, good sound" he said stressing the word 'sound'. Referring to his room he said that he had 'organised it a bit' but that it was not perfect for sound; a sprung wooden floor (as opposed to concrete) and the irregular alcove with its french windows to the garden were the main weaknesses.

He revealed that before this system he used a colossal pair of Western Electric bass horns which came into the room at the opposite end to the extension. The only remaining evidence of those are a couple of little patched squares high in the wall where the drivers had been situated. The old horns were huge judging by his gesticulations of their shape and proportions.

Going live

We stopped talking for a few minutes while he played me part of a Laserdisc: 'Das Konzert', recorded by Daniel Barenboim and the Berlin Philharmonic on the night of November 12 1989, the weekend the Berlin wall came down. "This is almost the same as being at a concert,"



get silly: pointing to our host's world globe atop a cabinet next to the midrange horns, he said it had been placed there specifically to deflect soundwaves.

Mr Imada says he has the ultimate sound system, having heard a range of sources and music material it would be churlish to try and disagree. As his favourite subject apart from music is economics, I asked whether he thought everyone should change their house to get a better sound. "Yes!" came the emphatic answer.

No metal dome technology here - the tweeter and mid-high horn keep the high notes sweet in this elaborate five-way speaker system.



This unusual Japanese rack system even has its own power supplies for the amps.

he said. Mr Imada attends concerts in any of Tokyo's famous halls "at least once a month". The rest of the time he can pretend he is at a concert by merely closing his eyes; he says one of his favourite listening times is in the early morning.

Mr Iwaoka said that he tailors his systems to the needs of clients. Royal Audio works with a local team of architects who drew up plans for the roof extension for the concrete horns. But not everyone has to have a steeple. In some cases RA has installed a half horn with a conventional cone type speaker rather than just a drive unit. Iwaoka also advises on the sometimes black art of treating room acoustics - walking about in this room clapping to explain the different characteristics of sound within the space. It can

The only problem with this, as far as our British readers are concerned, is that the steeple effect in this country is limited to church music.

System:

- Denon CD player
- Denon turntable (Koetsu cartridge)
- Pioneer Laserdisc player
- Sony Betamax VCR
- Victor (JVC) VHS VCR
- Denon open reel tape recorder
- Pioneer FM tuner
- Sony cassette deck
- Technics graphic equaliser
- Goto preamplifier
- Goto channel divider
- Four custom-made power amplifiers.

“Cambridge SoundWorks May Have The Best Value In The World. A Winner.”

David Clark—*Audio Magazine*

Ensemble

BY HENRY KLOSS

Ensemble is a speaker system that can provide the sound once reserved for the best speakers under laboratory conditions. It virtually disappears in your room. And because we market it directly, it costs hundreds less than it would in stores.

Ensemble consists of four speaker units. Two compact low-frequency speakers reproduce the deep bass, while two small satellite units reproduce the rest of the music, making it possible to reproduce just the right amount of energy in each part of the musical range without turning your listening room into a stereo showroom.

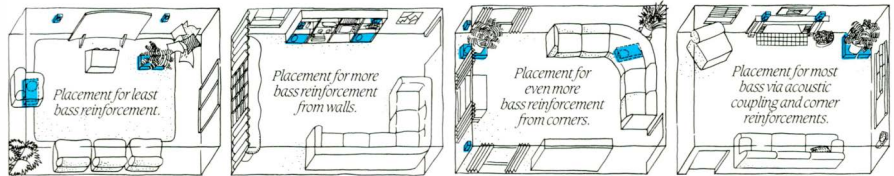
Your listening room works *with* Ensemble, not against it.

No matter how well a speaker performs, at home the listening room takes over. If you put a conventional speaker where the room can help the low bass, it may hinder the upper ranges, or vice-versa. Ensemble, on the other hand, *takes advantage* of your room's acoustics. The ear can't tell where bass comes from, which is why Ensemble's bass units can be tucked out of the way—on the floor, atop bookshelves, or under furni-



Introductory Price £299

ture. The satellites can be hung directly on the wall, or placed on windowsills or shelves. No bulky speaker boxes dominate your living space, yet Ensemble reproduces the deep bass that *no* mini speakers can.



You can put Ensemble's low-frequency units exactly where they should go for superb bass. You can't do this with conventional speakers because you have to be concerned about the upper frequencies coming from the same enclosures as the low ones.

Not all the differences are as obvious as our *two* subwoofers.

Unlike seemingly similar systems, Ensemble uses premium quality components for maximum power handling, individual crossovers that allow several wiring options and cabinets ruggedly constructed for proper acoustic performance. We even gold-plate all the connectors to prevent corrosion.

Unlike satellite systems which use a single large subwoofer, Ensemble features separate compact bass units for each stereo channel. They fit more gracefully into your living environment, and help minimize the effects of the listening room's standing waves.

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At only £299—complete with all hardware and 100' of speaker cable,—Ensemble is *the* value on today's speaker market. America's *Esquire* magazine describes them by saying, "You get a month to play with the speakers before you either return them or keep them. But you'll keep them." *Stereo Review* said "It's hard to imagine going wrong with Ensemble." For literature, reviews or to order, write us at the address in the coupon, or call 0 800 622 862* or 0 800 622 286*

“We Know Of No Small Speaker That Surpasses The Overall Sound Of Ambiance” —*Stereo Review*

Ambiance

BY HENRY KLOSS

Ambiance is an ultra-compact speaker that proves high performance, small size and low cost need not be mutually exclusive. Ambiance is ideal for bedrooms, studies...or for use as an extension speaker or in surround sound systems. While no speaker of its size can provide the same low bass as our Ensemble and Model Eleven systems, Ambiance has more output in the

40Hz region than any "mini speaker" we've encountered. *Stereo Review* magazine described Ambiance as "...beautifully balanced, delivering a full-size sound image with not a hint of its origin in two small boxes...very few small speakers we have heard can match the overall sound of Ambiance, and we know of none that surpass it." Available in Nextel or primed for painting for £179 pr. Or in solid oak for £199 pr.—backed by our 30-day money-back guarantee—direct from Cambridge SoundWorks.



Ambiance is an ultra-compact speaker that proves high performance, small size and low cost need not be mutually exclusive.

"You get a month to play with the speakers before you have to either return them or keep them. But you'll keep them."

Esquire

Inc. Magazine

"Henry Kloss brought Dolby sound, CrO₂ cassette tape, and large-screen projection television into living rooms, and made the dominant speakers systems of three decades: Acoustic Research in the 1950's, KLH in the '60s, and Advent in the '70s.

Now he's at it again at Cambridge SoundWorks, selling direct to the public."

"Very much in the Henry Kloss tradition... another hi-fi milestone."

Review

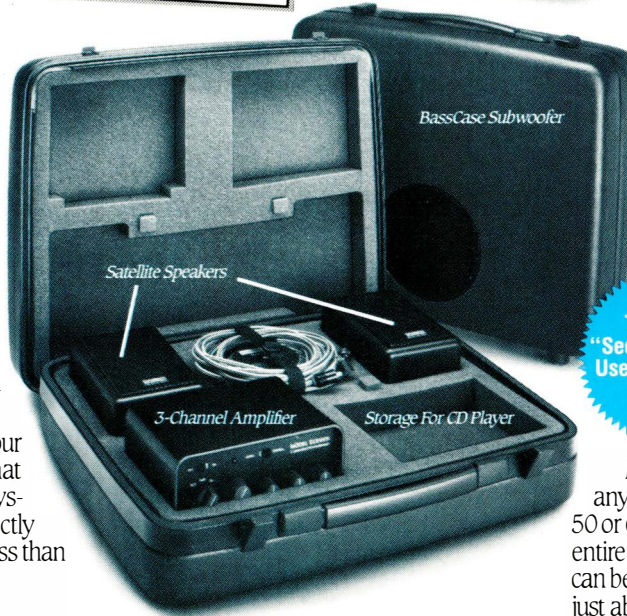
"They were designed to play music—and make it sound like music. This they do very well, in a most unobtrusive way, at a bargain price... it's hard to imagine going wrong with Ensemble!"

Stereo Review

MODEL ELEVEN

BY HENRY KLOSS

Cambridge SoundWorks' Model Eleven is the world's first *transportable* full-range, high performance component system. It consists of a powerful 3-channel amplifier and two "satellite" mid/high-frequency speakers—all packed in a rugged "BassCase"™ that, when empty, serves as the system's subwoofer. Model Eleven's performance, when coupled with your portable CD or tape player, * rivals that of the most expensive component systems. And because we market it directly from our factory, it costs hundreds less than it would in stores.



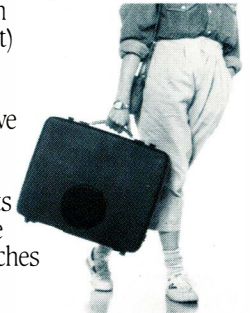
- Fits under airline seats—23 lbs.
- Can be checked as luggage.
- Works on all electrical systems.
- Delivers the full range of music.
- Is backed by a unique 5-year warranty.

- Perfect for boating, camping & holidays anywhere in the world.

The Ideal "Second Stereo" Use It 52 Weeks A Year

sound virtually identical to our acclaimed *Ensemble*® speaker system.

Model Eleven can be used virtually anywhere in the world—115- or 230-volt, 50 or 60 Hz AC or 12-volts DC. Because the entire system fits under an airline seat—or can be checked as baggage—you can take it just about anywhere. But Model Eleven's sound is so good, so "big," you may want to keep it home. It's an ideal second (or first) music system for a study, bedroom or kitchen. At £499 we don't know of any combination of components near its price (transportable or not) that approaches its sound quality.



The drivers used in Model Eleven's two-way satellite speakers are no-compromise, high-performance components—just like you'd expect to find in the finest home speaker systems.

work *with* a room's acoustics for optimum performance. Remove the satellite speakers, amplifier and your portable CD player from BassCase. Place the satellites where they create a musical "stage" near ear level. Put the BassCase where it reinforces low frequency output—on the floor, even behind furniture. The result is musically accurate



Performance that rivals the best home component systems.

Until now portable music systems were, at best, a compromise. Even the most expensive ones lack the deep bass necessary for full, natural sound. But Model Eleven delivers the all-out performance previously found only in high quality home component systems. Its three speakers are designed to

Henry Kloss created the dominant speaker models of the '50s (AR), '60s (KLH) and '70s (Advent)—as well as our highly acclaimed Ensemble and Ambiance™ speakers. While packing a stereo system into a suitcase before a holiday, he realized that an amplifier, a CD player and two small speakers take up the same space required for an acoustic suspension woofer to reproduce really deep bass. That was the inspiration for BassCase, Model Eleven's bass speaker enclosure which doubles as the entire system's carrying case.

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Taking arms

The village of Steyning in Sussex has been producing state-of-the-art tonearms for more than three decades.

Dan Houston visits the home of SME.

Photography by Chris Richardson.

The managing director of the tonearm specialist SME Limited has a tried and tested trick when he wants to show sceptics that his tonearms are the most rigid, and therefore inert, around. He hands you a hollow magnesium arm tube daring you to bend it with your bare hands, and spices the contest with the promise of a brand new *Series V* if you succeed.

Looking down the tube you can see how thin the metal is, and its weight in your hand suggests that even though Alastair Robertson-Aikman (ARA) has a twinkle in his eye at the moment, he'll be laughing on the other side of his face when you crush this tube like a tin can!

Far from it, exasperated and red-faced you join the large number of people who previously fell for the same trick. "We've even put these between two bricks and had people standing on them," says ARA matter-of-factly, taking back the small symbol of his achievements.

Those achievements are many; SME tonearms are famous throughout the world's hi-fi communities and are an aspirational item for thousands of audiophiles. They have been winning awards for design and engineering since 1962. Recently the readers of the Japanese hi-fi magazine *Stereo Sound* voted six

models of SME arms into the first six places in a published equipment referendum. Last year the French hi-fi nut-case's bible *L'Audiofile* awarded SME its coveted Les Musées d'Or award and this year...

This year may be different again. SME has broken with tradition and designed a turntable - the *Model 30*, which was launched in the autumn and which will almost certainly find its place among the top no-compromise record players in the world. The '30 costs £9,950.

Hobby engineer

It all started forty four years ago in the village of Steyning, nestling under the scarp of the South Downs in the hinterland of Worthing. After leaving school ARA founded Scale Model Equipment Limited in 1946, with the task of making scale models and other pieces of detailed engineering which required precision machining.

The first hi-fi components did not arrive until the late Fifties however, when ARA made a tonearm for himself. Encouraged by enthusiastic friends he decided to commercialise the product and began producing 25 arms per week in 1959. The investment in precision tooling paid off with the hi-fi community; the arms quickly achieved fame and the



Rumblearm: Bearing yokes for Series IV, V and 300 arms being rumble finished in a drum of silicon chips.

specialist press was enthusiastic.

One of the early reviewers was Percy Wilson, Technical Editor of *The Gramophone* magazine. "He liked them and I remember him saying we could probably sell around 1,000 arms a year," ARA told me. "But before he died he saw us take production to over 1,000 a week!" Well over a million SME arms have been produced, he estimates.

The success meant that work on other projects was stopped in 1968; the golden age of the turntable had arrived and SME, with a newly shortened name to reflect the change in direction, was well placed to supply tonearms to a growing army of hi-fi buffs. Indeed, the company has only recently started taking orders again for non-hi-fi work - building detailed com-



ponents for use in aircraft. ARA says he doesn't need the work: "It's just to justify and help pay for some new equipment we've installed."

Other models joined the first two series with the aspirational *Series V* and *Series IV* arriving in 1986 and 1987 respectively. These serious products have equally serious prices; a *V* will set you back £1,247, while the *IV* is a slightly more modest £810.

SME also makes arms for other turntable manufacturers; Thorens and Rake Transroter in Germany, and for Oracle in Canada.

Fine engineering

One of the aspects which sets SME apart from every other manufacturing plant we

Working to tolerances of less than a ten thousandth of an inch, nothing is rushed at SME.

have visited is the tooling capability of the factory. Uniquely for current Britain, they make most of the parts on the premises rather than just assemble. SME even makes its own screws and virtually nothing is trusted to outside contractors. The ground floor of the factory houses an impressive array of machinery - from the lathes and drilling tools to the five ton presses used to manufacture the machine tools themselves. Works Manager Liam Daly showed us around, explaining how individual parts were turned on a lathe and then anodised, or rumbled in a vibrating drum of silicon chips to give them a smooth silky finish. "All our die-cast stuff is rumbled," he said pulling out a long string of arm bearings from the barrel, "we leave the machines on overnight."

An even silkier 'satin' finish is achieved by blasting the component with aluminium oxide in a chamber. We also found a 'thread-rolling machine' designed especially for taking the swarf off screws and bolts after they have been turned. "We needed smooth screws," Liam explained, indicting the rest of British industry by adding that it had been necessary to bring all the tooling processes 'in-house' over the years. We were then shown how the main spindle shafts for the turntable were ground; an operation which takes four days per spindle. "You can't rush anything like that. We have a tolerance of less

than half of a tenth of a thousandth of an inch," Liam testified, counting off fingers. "The aircraft industry thinks our stuff is over engineered. They ask us for stuff which is within 125 micro-inches," he scoffed. Needless to say the craftsmen at this factory don't measure things by eye - electronic measuring devices gauge the required accuracy. Many of the machines are reserved for a particular job; "the tolerances are so fine that it would take a week to set them up again," Liam said.

The attention these components receive during manufacture pays off later; the finished products are not only gorgeous to look at but have a tactile quality which breathes class.

The cost of replacing this machinery would run into millions of pounds. ARA reckons it would be almost impossible to start such a company from scratch, be able to achieve such consistent and high quality results and still make money. But his investment has been worthwhile he says. "Once you have bought it (the tool) then it is always there and these machines do last a long time. Take our bearing honer. That cost us £25,000 in 1965 and it does just one job for us . . . but it does it perfectly and has paid for itself over the years. In fact the *Series V* tonearm is one of the cheapest arms on the market. It cost us £750,000 to tool. The die for the magnesium arm alone cost £50,000 - most people

would look for a far greater return on that kind of investment."

Off-peak power

With products that command such a high price in the marketplace, it may seem as though there is no expense spared on their manufacture. But SME has streamlined its operation to the degree where certain components are made in the summer because it is cheaper.

"The electricity is cheaper then and the die casting is using a lot; the tool steel moulds here are using around 30kW of power. The cost of electricity goes up in winter so we save up the die casting through the summer to see us through the winter," Liam explained. Other streamlining has seen the workforce reduced from 150 to only 55 but this in part reflects the demise of turntables in the digital age. Most of the staff are from the locality - SME is unsurprisingly the only factory in the village - and many have trained with the firm.

Series 30 turntable

Curiously SME has waited until this moment to launch its statement on the art of turntable technology. How did the *Series 30* come about?

"The turntable was conceived and produced in 14 weeks from start to finish," ARA boasts. "I must admit it is something that we couldn't have done without all our facilities - we can think of something and then make it a reality in hours.

"I decided to produce it because my wife went into the B&W shop in Worthing and they asked why I hadn't made a turntable. She told me on February 9th last year, on February 10th I said let's do it and by the 12th we had a mock-up with rubber band suspension. We had to have it in production for the Chicago CES (the major American consumer electronics show, held in the summer) and there has been some refinement since then."

But why a turntable now? ARA had already admitted that his business plan was basically to achieve a higher share of the diminishing market. "The fact is that there are large libraries of LPs across the world. The largest I have heard of is some 50,000 records, in Germany. If people can hear those records better than they have ever heard them before then they're much better off buying a good turntable than buying a CD player. But I also consider the hobby aspect of analogue; it's one of the most important factors we are dealing with. With a CD player so much is done for you that it's a bit like living in Swit-



A CNC lathe in action, one of SME's engineers turns up a part for the turntable.

zerland - the more cut and dried it becomes the less participation you have. But with a record player you are far more involved - it gives you more participation and fun from your records.

Faith in analogue

"That is one of the reasons the '30 has a 78rpm (as well as 45 and 33) speed. It is ideal for the serious collectors of those records in America."

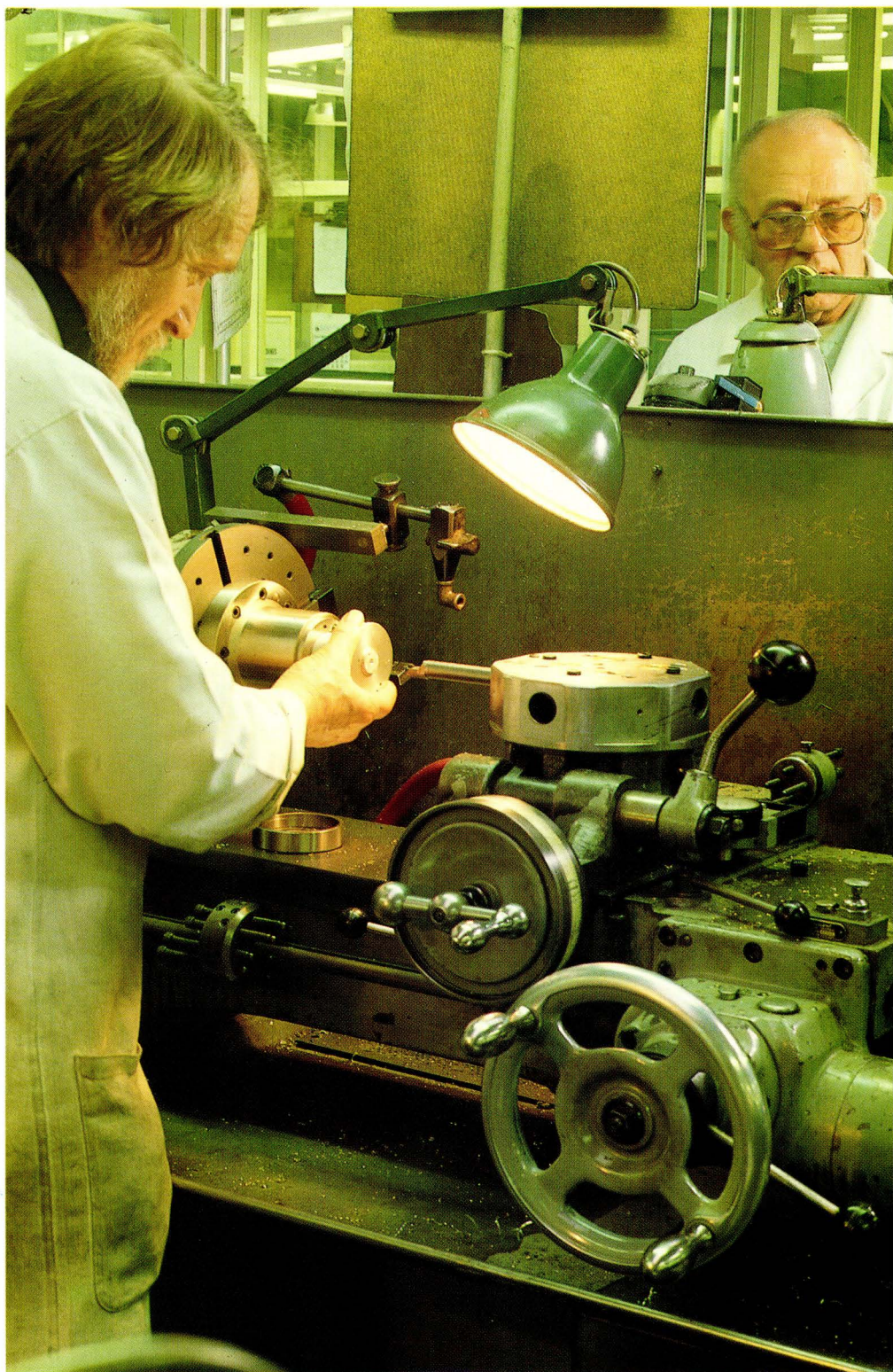
It sounds like an admission that the only audiophiles interested in SME products will be those who already have large record collections; nascent sound buffs will miss the analogue hook for the CD trawl. ARA is more hopeful: "Digital is improving. But the best sound we can hear is analogue, there's not much argument across the world about that. The human ear and the human voice are both analogue... and if you stay with that you cut out the whole process of digital to analogue conversion. I believe analogue will come back. When I was boy everybody had brass bedsteads and everybody got rid of them. Now they are an industry again. I think that once the digital honeymoon is over the more discerning people will discover that the new medium only offers engineering convenience... then they will go back to the analogue medium."

While it's difficult to imagine Sony, Technics and Philips suddenly throwing in the digital towel, SME products certainly have a longevity that belies obsolescence. The factory sees a fair share of arms returning for upgrading or repair. "There is no such thing as an old SME arm, they can always be repaired or restored here," ARA reassures.

ARA describes himself as entirely self taught, based on 'natural inclination'. "I've always found lots of people who were willing to help me if I wanted to know something. When I first started I used to go to the nearest small engineering company. It's surprising what they would tell me."

He is now 67, but as the *Series 30* testifies, is still very much involved with the company, living just three minutes drive away. "I say with cautious optimism that I have got 'some time yet'. I spend most of my time in product development with Reg Edey our design draughtsman; I visualise the product and he's wonderful at translating those ideas onto paper. My interests are producing well-made high-performing products, and having happy customers."

One of his tasks is to be final quality



Two of SMEs engineers using the analogue approach to engineering excellence.

controller at the factory; as he describes it "the final long stop so that people do the job the way it should be done". This has evolved into a ceremony. ARA dons white gloves and jeweller's eye-glass to seek out any minute flaws in his products - arranged on a rack before him. His Rolex wristwatch is a useful guide to check that the gold lettering on a 'V' has been printed just so. "I tell him he should let me use the watch when he's away so that I can be sure we've got it right," Liam mused, "but the comment falls on deaf ears!"

Surely not?

Curriculum Vitae

SME Limited	
Alastair Robertson-Aikman	
Married with two sons	
Age 67	
1946 SME Founded	
1959 First tonearm, the <i>Series I</i>	
1986 <i>Series V</i>	
1987 <i>Series IV</i>	
1988 <i>Series 300</i>	
1990 <i>Series 30</i> turntable	
Number of employees:	55
Annual turnover:	£1m



Choice Sessions

This month JK has been auditioning the new power supply unit for the Voyd Valdi turntable while Dan Houston has been off to Japan.

12 Days in Japan

Choice scribe Dan Houston has just returned from a two week tour of Japan where, accompanied by photographer Chris Richardson, he saw some of the products we'll all be talking about next year.

Over the coming months readers will notice an oriental flavour to *Choice*. Photographer Chris Richardson and I have been to the land of the rising sun, bringing back a series of articles on a diverse range of Japanese hi-fi companies. Over a fascinating and hectic two weeks we interviewed the personalities behind many esteemed hi-fi names and products, from one man operations to the likes of Sony stalwart Dr Heitaro Nakajima, inventor of digital audio and deputy president of the Japan Audio Society.

Japanese companies rule the world of hi-fi sales. The UK home audio market, including both midi systems and separates is worth around £750 million per year (according to market researchers BIS Strategic Decisions) and Japanese companies enjoy a 70 per cent share (G&A Marketing figures). Add the markets in the rest of the world and you begin to see why Japan is the number two economy behind the USA.

During our time in Japan we spent a day in the Akihabara - Tokyo's famous 'Electric Town' where neon takes prec-

edence over oxygen, and where just about every floor of every building in a 300 by 500 metre block is devoted to electronics. It's an anorak Mecca, criss-crossed with warrens of colourful electronic component bazaars where storeholders display trays of gold-plated phono plugs, capacitors, digital chips and whatnots. It's the electronics equivalent of an oriental spice market.

For our regular through-the-keyhole *Aspirations* feature we brought back a couple of stories. Firstly of a hi-fi buff who extended his house to accommodate a



The Akihabara, a far cry from Tottenham Court Road.

pair of massive bass horns (this issue, pages 14 - 17) and secondly of Kimihiko Sugano, one of Pioneer's senior managers who spent many years in charge of the company's high-end design team. He lives in the suburbs to the west of Tokyo, near his father, who is the craftsman behind Koetsu cartridges.

Another feature to look out for is the story behind Stax - where the 84-year-old founder is still hard at work perfecting a horn loaded electrostatic loudspeaker (and you thought they just made superb headphones!).

We'll be starting our run of Japanese Craftsman features next month with a full report on our visit to the tape machine wizards at Nakamichi. It turns out that they are now almost embarrassed that sales of their Music Bank CD players have overtaken cassette decks sales.

Taking music very seriously, the Nakamichi HQ even boasts a small concert hall where engineers can listen to the real thing before playing back the tape in their listening room.

Brits in Japan

One of our first ideas when planning the trip was to find out the development story behind that hot sensation of last autumn - the Pioneer A400 amplifier. Pioneer is one of the few multinational companies that can prove it designs products for individual home markets; apart from the British 'audiophile' credentials you'll no-

tice that the *A400* boasts a three core power cable and proper earthing for Britain. When we visited Pioneer's awesome research and development facility in Tokyo we were introduced to some of the British engineers who are now working on similar projects. The Brits, we were told, are highly regarded for their logicality, motivation and technical ability when they graduate; their input was invaluable to Pioneer re-establishing its hi-fi credentials.

Our list of features doesn't stop there; we also visited the highly regarded valve amplifier maker Ken Shindo in his Tokyo showroom and workshop, which serves double purpose as also one of the few vinyl record stores in an almost completely digitised Japan. We also met the men behind Aiwa's DAT products who, in the light of the medium's difficult birth (and with DCC peeking its head over the horizon), are busy adding a digital video element to the sound.

Japanese high-end

Although the bulk of Japanese hi-fi trade is obviously in mass market products, there is also a lot of high end activity, with companies like Shindo Laboratories, Audio Note and others operating alongside the 'high-end divisions' of the likes of Sony and Pioneer.

The sound quality of Japanese high-end equipment is as good as anywhere else in the world. The smaller companies are potentially more interesting in their technical approaches, with an anachronistic adherence to valve circuitry in a country where the transistor is such a large contributor to the national economy.

With all this in mind one would expect that there would be little room in the Japanese listening room for British hi-fi. But just as Tokyo high flyers like to drive a BMW or Mercedes, so all European marques have their cachet; the more salubrious shops of the Akihabara sport speakers from Celestion, Harbeth et al. Just as foreign coal is sold in Newcastle.

All in the supply

Voyd has been making a few changes to the power supply on its Valdi turntable. Jason Kennedy's been giving it a spin.

Linn *Sondek* owners are not the only vinyl enthusiasts to have been offered a new power supply for their turntables this winter, as Voyd *Valdi* owners have also been tempted with a similar option. The *Valdi* - two motor variation of the respected three motor Voyd *Voyd* - has lost the heatsinks that used to adorn its rear

end, and has traded in the black plastic encased power supply for a serious looking metal boxed affair. This is in fact a scaled down version of the split phase supply that drives the standard *Voyd*, it's the same circuit with smaller reservoir caps and a smaller mains transformer.

The upgrade means that the *Valdi's* heatsink has found its way onto the new supply and sits next to the IEC input socket and DIN output. As a result the electronic speed change switch has moved from the back of the plinth to the front of the supply, but there's still an on/off switch on the turntable itself as well as on the new black box. This is convenient if you can cope with the idea of leaving the supply idling full time, which isn't a particularly expensive option and probably results in a sonic improvement.

Not being a full time *Valdi* user I assessed this upgrade with the aid of an old style *Valdi* deck and swapped a Helius *Aureus* arm and Ortofon *Quasar* cartridge between the two. I had hoped to just swap styli on a couple of Goldring MM bodies, but when it came to the crunch I was short of an appropriate pair of armboards. At least a very revealing arm and cartridge combination was used which made the job less taxing, even if swapping armboards was a bit of a bore.

The record or the player?

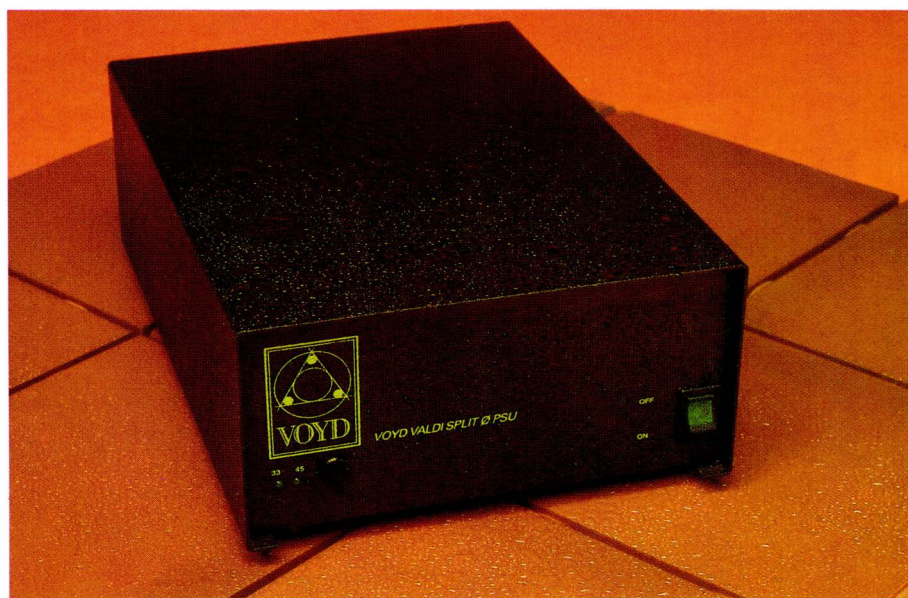
Listening to the two decks, the most obvious improvement wrought by the new supply was a far greater sense of relaxation, as if less spurious energy was getting to the stylus. The deck sounded less lively and forward, it allowed more subtle dynamic inflections to be retrieved by the

cartridge resulting in a musically more convincing and natural sound.

The popularity of some other sources suggests that a slightly aggressive sound is liked by many listeners. Forward sound can be impressive and makes rock records sound more exciting, but in the long term it can be fatiguing and colours musical subtleties. Ultimately you have to decide whether you want to listen to the player or the record. What this new power supply does is allow you to hear more of the record by reducing the mark that the player leaves on the sound.

In hi-fi terms it sounds less vague and images more precisely, individual notes have more time and space to be heard and it even sounds a bit louder. Guns 'N' Roses' remarkably well recorded *Lies* LP sounded more palpable, their acoustic guitars sounding that much more resonant and raunchy. With lyrics like 'I used to love her, but I had to kill her' you can't go wrong, can you?

At the end of the day, I ended up using the new *Valdi* for quite some time and found it a remarkably competent and enjoyable player. I listened out for but couldn't detect the one note bass that Richard Black accused this player of producing in *Choice* issue 79; it seemed as dynamic and articulate at low frequencies as it did throughout the rest of the spectrum. The new supply may well have something to do with this, and at £165 for the upgrade, owners of the old style *Valdi* should consider investing in it. Meanwhile anyone looking for a deck in the £699 price range would be doing themselves a disservice by not auditioning this motor unit.



Jason Kennedy has been mainlining on the Voyd power supply.

Statements

More tales from the world of high-end. Roy Gregory finds an outstanding phono stage for under £400, Richard Black finds a good pair of bookshelf speakers - for £1,388; and John Bamford investigates Musical Fidelity's MC6.

While the Wembley-based Musical Fidelity company is best known for its high quality amplifiers, bossman Antony Michaelson even branching out during recent months to form a new company, Michaelson Audio, which manufactures the £10,000 *Chronos* valve pre/power combination, the company has also enjoyed considerable success over the years with 'affordable' hi-fi loudspeakers. Models like the MC2 and MC4 'bookshelf' designs (why do we continue to give moderately-sized enclosures the term 'bookshelf' when we wouldn't dream of using them on anything other than a proper speaker stand?) have proved extremely popular with reviewers and consumers alike.

MC Hammer?

Yet there is a tall, floorstanding, three-way model in the Musical Fidelity product line-up which is little talked about in hi-fi circles. Called the MC6, this 1.1 metre tall model is currently MF's flagship loudspeaker - it costs £1,999. It's a discreet, 'domestically acceptable' design, clothed in a black 'stocking' grille cloth (which cannot be removed) with a glossy top plate that makes the speaker distinctly unobtrusive in the living room. Sensitivity is 92.5dB, it's an easy speaker to drive for most competent amplifiers, while at the same time it enjoys a good 'thrashing' from powerhouse amplifiers like the company's massive *A370* power amplifier - or, indeed, the *Chronos* 100watt valve monoblocks.

What makes the MC6 distinctly unusual is the way it has been configured, with two rear-firing drivers plus tweeter in addition to the forward facing drivers. Designed to energise the room in such a way that the sound combines the dynamics of a moving coil loudspeaker with the depth and soundstaging characteristics of a planar model, it needs to be placed well away from the rear wall for

best results. Nonetheless, experimenting with positioning in the listening room is the name of the game. I found a good compromise between image depth and bass 'oomph' was achieved with the MC6s about 60cm from the rear wall.

The MC6 might not be a speaker which grabs the attention, but in a balanced system it does have a lot of charm. Despite a slightly 'cuppy' zing at high frequencies, the midrange is beautifully open and relaxing. This is combined with a rich and fruity bass which goes surprising low

when fed with the right programme material.

In fact the MC6 is perhaps best described for what it's not: the MC6 is not a highly detailed, up-front monitor speaker of the type enjoyed by so many rock music fans; nor is it a syrupy smooth Quad *ESL63* or Magnepan. It's more a balance between the two, the scales tipping just slightly towards the softer, more laid-back approach which might be best appreciated by the classical music fan.

Of course, I'm generalising wildly. I



Musical Fidelity MC6s: two grand for an easy sound, but not for tweaking.

listen predominantly to rock music, yet I enjoyed my few brief days with the *MC6s* enormously. As you'd expect from a pair of speakers at this price, they produce a good sense of scale - somewhere between the *SD Acoustics OBS* (£845) and *Snell Type C* (£2,350). Where it perhaps doesn't compete in terms of 'sound per pound' is with *SD Acoustics'* very large *SD1* model, which is remarkably good value at £1,350. That said, it is a different animal, the *MC6* being geared distinctly towards the music listener rather than the hi-fi hobbyist. Although as one would expect of a speaker at this price point, bi-wiring is an option, but the somewhat 'rose-tinted' characteristic of the sound encourages a 'fit-and-forget' attitude. Imaging is a little vague but what you do get is a marvellous sense of breadth and depth to the soundstage. And unlike so many 'hi-tech' hi-fi loudspeakers, the *MC6s* have the ability to fill a room with sound, with no real 'hot spot' to the listening position.

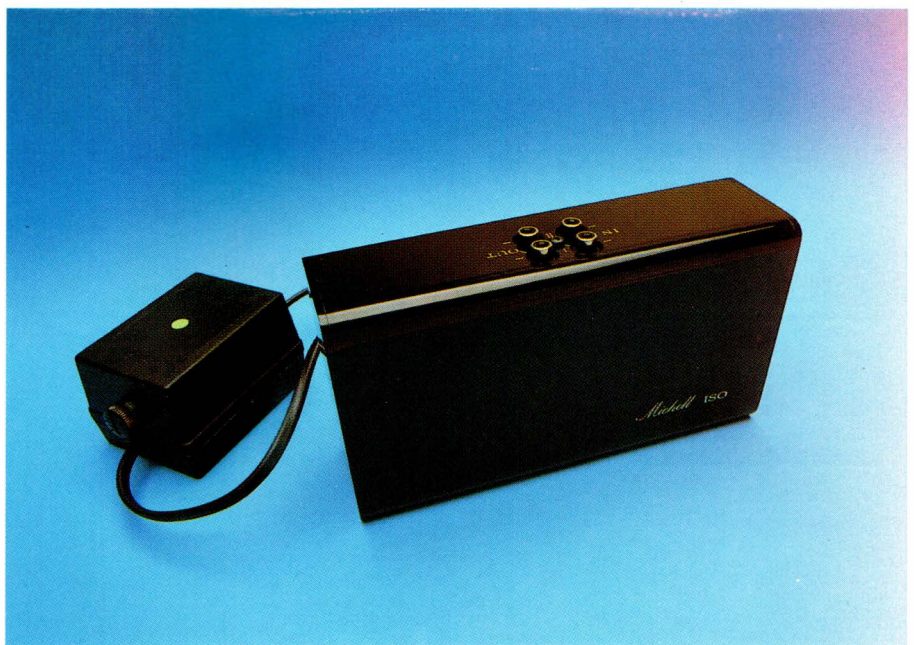
The *MC6* consequently represents something of a change in direction for Musical Fidelity loudspeakers. Yes, it is a very fine hi-fi loudspeaker, and you could argue that the design is rather adventurous, but at the same time it is a 'safe bet' in its gearing towards designer-conscious homes where leading edge performance in dynamics and detail are sacrificed for a domestically pleasing and relaxed-sounding transducer.

John Bamford

One night, many moons ago, a group of people gathered in former editor John Bamford's basement listening room for a session with the new wunderkind amp, the *Pioneer A400*. The assembled crew were gobsmacked by the little monster's performance, driving speakers priced at around ten times its own cost. But only with CD. Unfortunately, the phono stage wasn't in the same class as the line and output stages. Plugging in a *Finestra* preamp soon proved the point - and the *A400's* potential.

"If only," mused the then editor, "someone could produce a really great phono stage for not much money - what a combination!"

And there things would have undoubtedly remained, except that one of the occupants of "the cellar" was Tom Evans, designer of the aforementioned *Finestra*. To say that Tom was impressed by the *A400* is an understatement. The *JBL XPL 2000s* and "all original" Zappa



The Michell Iso is a neat way to upgrade an amplifier with an inferior phono stage.

collection could also have influenced him. Either way, JB's suggestion was taken very seriously and in due course a bread-board version of just such a phono stage was produced. The results were really rather special, and having finalised the design, all that remained was to find someone to produce it. Given Tom's love of plastic casework, who better than John Michell, and so the *Michell Iso* was born.

What applies to the *A400* also applies to a great many other amps. To build a good power amp isn't that difficult, but to build a good phono stage is an entirely different matter. The incoming signal is so tiny that the least interference with it causes massive damage and this, more than anything else, accounts for the tiny number of really good preamps around. It also helps to explain their cost.

Good build

Using a circuit similar to that in the *Finestra's* line stage, the *Iso* is a small plastic-clad unit driven by the outboard power supply used as standard on the *Gyrodec*. Open it up and you'll find a single PCB with the bare minimum of components. The circuitry is totally dual mono and at its heart you'll see two pairs of op-amps. Shock, horror, aren't op-amps supposed to be the root and personification of all things evil in preamp design? Well, they used to be, but the *Finestra* proved that, used correctly, they can produce excellent results. The catch, of course, is using them correctly.

Both the *Finestra* and *Iso* use their far from standard op-amps in a novel, phase corrective configuration which produces a theoretically phase coherent amplification stage. The difference is that the *Finestra* opted for transformers in its phono stage, whereas the *Iso* takes the phase corrective element that much closer to the source.

Standard *Iso's* are set up for moving coils with an output up to 0.6 mV. Special versions for higher output MC and also MM cartridges are available. According to Tom Evans, special termination or loading requirements can be supplied to order, at a small extra cost. Aside from that the box has a set of inputs, a set of outputs and a small LED to tell you that it's plugged in.

Sonically? Let's not beat around the bush. The *Iso* is the best moving coil stage I've heard. I haven't heard them all, and some like the American Vendetta Research, remain out of reach. But I have heard the heavyweights on offer in the UK, home-grown or imported. At home I use the Peter Sanhen *SP 1.5*, a bespoke product which has shown a clean pair of heels to the competition at two or three times its £1,800 asking price. Its superiority in both musical and hi-fi terms has remained unchallenged for nigh on three years now.

Plugging the *Iso* into one of the direct inputs blew the *SP 1.5's* phono stage out of the water. Now my *SP* is fairly long in the tooth - the second one ever made. Current versions sound a lot better - but the *Iso* forced me to arrange a replacement for my venerable campaigner. And it did it by a display of superiority that is normally the *SP's* preserve over other products. Impressive stuff!

What exactly does the *Iso* do so well? It's ghostly quiet with enough gain for even the lowest output cartridges - Ortofon owners take note! Secondly, the high output means that you can, if you wish, use the *Iso* with a passive volume control. It's not an approach I particularly endorse, preferring to use a high quality line stage (come back *SP 1.5* - all is forgiven), but on a simple, small scale works the results are very impressive.



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I've lost count of the number of reviews which claim a product has no "sound" of its own. I've done it myself, and yet in real terms it's a cop out. Going back to my comments on the quality of most phono stages, it should be clear that good ones do less damage to the signal. To put it another way, they are less obstructive. They simply pass on what you give them, but bigger. The *Iso* is the least obstructive unit I've ever heard. Forget warmth and romance, or clinical detail, the *Iso* gives you exactly what it's given. Or more of it than anything else manages. Listening to it makes you realise just how confused most phono stages sound, and how much information and detail they strip away.

Plug in the *Iso* and put on a record that you know well. Preferably something with a real acoustic and real instruments. Suddenly you'll be able to hear into the soundstage - right to the back wall if it's on the recording. Instruments will be locked in space with an uncanny sense of presence and solidity.

What you're hearing is the *Iso's* ability to reconstruct the acoustic environment of a recording. The *Iso* gives you a coherent whole rather than lots of misshapen and confused bits. Everything happens in the correct time and place.

There are downsides. The *Iso* is cruelly revealing, both of recordings and record decks. You might not always like what it tells you. It also needs to be sited well away from any other equipment, although its size helps here. You also need another set of interconnects - and they'd better be good ones too.

The price? I saved that for last. £380. That cheap and that good, I don't care if you have got an *SP-II*, hear an *Iso* now!

Roy Gregory

Readers of issue 86 may have noticed a review of an expensive, moderately-sized loudspeaker from ATC, the *SCM20*. I did, and passed it by with a slight yawn. 'Another two-way smallish box, probably okay, must look at one some year soon . . .' I knew that ATC speakers are extensively used by audio professionals, but one soon learns this is no sure guarantee of sound quality.

However, when marketing man Ashley James told me "we make the best loudspeakers in the world", I was inclined to give him the benefit of the doubt; after all, if you make a good product, why be modest? So I accepted the offer of a pair of *SCM20s* on loan, to hear some Sumo amplifiers at their best.

Reviewer euphoria

I resisted phoning ATC until the morning after the speakers were delivered to ask how much he wanted for them. It took me all of ten minutes' listening to decide that they were quite some transducer, ideal for my needs, and essential reviewing kit. Sometimes you fall for a piece of equipment slowly, sometimes at once, and this was definitely love at first audition. After using the *ATCs* for over two months, I've not gone off them - on the contrary.

My enthusiasm puts me at odds with the opinions of the *Choice* reviewing panel, which was less impressed by these same loudspeakers (see the precis in the *Choice Directory*). But as has been repeatedly stressed here (and elsewhere), there



A second appraisal of the £1,388 ATC SCM20s revealed their qualities.

is more to building a good hi-fi system than just throwing together any arbitrary selection of good components. Paul Messenger's system (in which the '20s were originally reviewed) and mine do not share a single item of equipment, though both give pleasure to their owners; so one can only conclude that Paul's system is simply not matched to the ATC's principles. So in my system (including *PT100*, *SME* arm, *Shure* cartridge, *Moth* and *Harman/Kardon* amplifiers), the ATC sound is an ideal match. ATC's main claims for its designs are flat frequency response (typically within 1.5dB over most

of the band) and low distortion, aims achieved by the use of carefully designed drive units and matching cabinets. The thing that surprised me most about the *ATC drivers* is that they're both made of soft, non-resonant materials; the 20cm doped paper bass unit is made by ATC, while the soft dome tweeter is bought in but individually selected for consistency. I was never before convinced of the value of either 'soggy' driver materials or of dome drivers, being an adherent to the 'Jordan principles' of essentially lossless cone drivers designed on a transmission line basis and resistively terminated at the surround, but my ears now tell me that soft drivers can be made to work, and work extremely well.

My first impression of the *SCM20s*, and one that remains the strongest, is a revelation of detail. Most other speakers will allow you to hear more or less what is going in, but with these *ATCs* the detail is more natural, less congested, and more . . . er . . . detailed. That applies to any type of music, whether it be a single voice or a Mahlerian symphony orchestra; one just hears that much more of the original, and, correspondingly, less of the speaker.

Nor is this detail achieved at the expense of other desirable parameters. Bass, while certainly not in the 'reggae wardrobe' league, is plenty adequate and particularly well integrated; treble extension is smooth but not overemphasised,

and maximum loudness is pretty loud. For all their lowish sensitivity (82dB/W), the *SCM20s'* ability to handle over 200W without distress allows them to generate more than enough sound to do justice to *Grace Jones*, for example. Only when I'm in a particularly nasty mood do I ever wish for an amplifier with more power than my usual 70W.

Is there a drawback? Only the £1,388 price, but I've heard speakers for much, much more money sounding a lot less natural. In the context of high-end audio these are fine value, with the usual proviso that you audition them in your own system.

Richard Black

Titanium-wash

DENON

With the NS-1 Denon has tried to create a user-friendly hi-fi. Victoria Cooper discusses the case for fewer twiddly bits.

Just about everyone I know listens to music. In the car, at home or on the move, music is a constant companion, and yet it's normally delivered by a transistor radio, a personal stereo or a far from exotic car radio. It seems that while people want music, they're not into the hassle and the domestic upset of doing the job properly. It's amazing how many visitors, seeing the huge speakers, the tangle of cables and the wrought iron work holding up the system, assume that it must be 'his'. How on earth do I put up with it?

There's a massive gulf between the ideals of musical reproduction so actively pursued by hi-fi manufacturers and dealers, and the expectations of the general public. To most people hi-fi just isn't that important. Music should be heard and not seen! And yet ironically, the systems aimed at the lower end of the market are generally so decked out with knobs, buttons and lights, so overtly technical as to inspire awe in the prospective purchaser.

Those who complain about a shrinking market for hi-fi would do well to pay a little more attention to their customers' needs, rather than trying to tell them what they want. In a world where Dad gets the kids to program the video, why are hi-fi manufacturers intent on wasting time on ever more complex and versatile systems? Hasn't anybody thought of using the massive step forward in processor power to make the system do some of the work? Isn't it about time the people who make "real" hi-fi stopped laughing about Bang & Olufsen and looked at their sales figures? That should wipe a few smug grins off complacent faces.

If you want good sound then you have to put up with the paraphernalia of 'high fidelity'; cables like hawsers, spikes on everything.

All of which leaves the design conscious, technophobic, or simply disinterested purchaser completely uncatered for. Into this void Denon has pushed its £800 NSI system, in a deliberate and well-aimed piece of niche marketing.

No technospeak

How can I be so sure of Denon's realisation? Coinciding with the launch of the NSI, Denon has produced a Non-Technical Guide to Hi-Fi (written by Sally Milne). It contains clear and sensible explanations as to what each bit of a hi-fi does, and what you should look for in making a choice. Despite being the product of a Japanese major league company, the advice offered is refreshingly free of a party line. For instance, turntables receive a more than fair deal, with the general superiority of manual models pointed out. Likewise, the discussion of cables and accessories is well-pitched for the intended audience.

Add to this an extensive glossary of jargon and a list of recommended recordings, and you have a package which is going to be a big help to the hi-fi buyer who isn't into hi-fi. Okay, so I would have chosen some different recordings, but it's a generous thought.

What has Denon done with the hardware of the NSI to make it more friendly, or less intimidating?

On the face of it, there's nothing terribly novel about a full width stack consisting of a 50 watt receiver, matching CD

player and cassette deck. But move closer. The three units are virtually identical to look at. Large central display, same soft titanium finish and near absence of controls. In fact all but the most basic controls are hidden away behind full width flaps which hinge down if necessary. Even the remote control (of course it has a remote control) is fairly simple, with a bare minimum of buttons.

Denon has simplified things considerably by the inclusion of logic switching on the amp. Press "play" on the CD player and the amp automatically selects the CD input. Aside from the volume control, the only other switches visible on the receiver are three buttons for tuner presets.

Under the flap are hidden all the goodies for tuning the buttons and the other 27 available presets, tone controls and variable loudness, balance and timer controls. Hook the receiver up to its matching partners and it becomes the heart of an all-singing, all-dancing system which is elegant to look at and elegant to use.

Round the back, connections are carefully labelled, including a full set for no fewer than three video sources, an external processor and of course, the lowly phono source, in case anyone still uses it! Clip-on cable covers prevent the usual spaghetti from spilling into view.

Denon makes no secret of the target group towards which they've aimed the NSI. The question is, have they got it right? In order to find out, I dumped the whole lot onto a next door neighbour. She suffers from the most severe case of technofear I've ever encountered. Could she assemble and operate the NSI? A test indeed.

***I**t's a fair cop: for too long, hi-fi has been ugly and difficult to set up. Denon has recognised this and simplified the system.*



After a week of plucking up courage (and fending off her gadget-mad husband, by the simple expedient of hiding the cables) she gave me a triumphant call. She'd done it and it worked. She'd even called up her various offspring to play it to them down the phone. Clearly Denon has got this part of the equation right, helped by an excellent set of instructions. But is that really enough? Wouldn't it be nice if it actually sounded good too?

How it performs

I can report that all is well. The 20 bit, eight times oversampling CD player is a refined and controlled performer, with none of the brashness and glare that you get from so many midi CDs. If I want my ears pierced, I'll get it done professionally, thank you. Not unlike the early Denon CDs (remember the DCD 1500?) this one has a laid back sound, and a soundstage which doesn't leap out to grab you by the throat. Detail and stereo separation are both excellent for the price, and if it doesn't have the body and substance of an Arcam Alpha, then it certainly shows the cheaper Marantz players a clean pair of heels.

Used with the remote control it gives you as many facilities as you could possibly want, although I'm surprised but far

An £800 system that's aimed at people who their music to look good as well.

from disappointed to discover no "shuffle the tracks to fit them on your tape" facility of the kind so beloved by Sony and Yamaha. In fact, it's a refreshingly straightforward package which stays close to the ideals of simplicity and ease of use.

The cassette deck is one of the nicest I've used. The drawer loaded twin head transport adds a touch which I'll admit I find appealing. Having said that, it makes those heads all but inaccessible, and a proper cleaner of the rub-a-dub cassette type is an essential extra. Sonically, results are fine. For around £250 this machine may not be as good as Denon's best, but I think few buyers are going to complain. Remote control, auto reverse, auto record level if you're using the CD player, and all in such a cute package.

The tuner section is standard Japanese digital, with all of the advantages that entails. But the performance of the parts isn't really the point. The real question is, does the whole exceed the sum of those parts? The answer is an unequivocal yes. The lively and upfront amp suits the sound of the CD player and the whole system sounds remarkably assured. It's also a joy

to use. It may not match the very best separates at the price, but then they don't come close for facilities, good looks and the NSI's other, numerous advantages.

Room for improvement

Quibbles exist, don't they always? Switching to any input except the cassette, tuner or CD means manual operation of a switch behind the amp's flap. The auto record level system on the cassette deck only works within the NSI system - not ideal for the non-dedicated user who wants to record their LPs for the car. A more visible indicator on the level control would be handy too. However, these are minor points. More importantly, the amp is less than happy with an awkward load, and a pair of Kef C15s caused it audible distress. So, reasonably efficient speakers are a must.

Granted that proviso, the Denon NSI is a resounding success and bang on target. My next door neighbours are so enamoured they'll be buying one, when Denon prizes the review sample away from their grasp. As for me, I'd be equally happy recommending the NSI to my architect friends, designers from the Isle of Dogs or my parents. And that's really saying something.



GLOSSARY

The Hi-Fi Choice dictionary of audio terminology, explaining all the weird and wonderful adjectives used by our reviewers, as well as technical abbreviations.

AM: Amplitude modulated; see 'Medium Wave'.

ACOUSTIC BREAKTHROUGH: Sound that gets into the turntable and hence the cartridge from the air and thereby creates a risk of acoustic feedback.

ACOUSTIC FEEDBACK: If any sound in the room can find its way through the body of the record deck to the cartridge stylus, then that sound will be reproduced from the loudspeakers, along with the wanted programme material. If too much of this sound from the loudspeakers is picked up by the cartridge in this way then a vicious circle of acoustic feedback will be created.

ACTIVE: Speaker systems which contain electronic crossovers and where the drive units are connected directly to power amplifiers.

ALIGNMENT PROTRACTOR: A device used to minimise the lateral tracking error of a cartridge/arm combination.

AMPLITUDE: Size or magnitude; hence the amplitude/frequency response, known normally simply as the frequency response, which describes the relative loudness of the system at different frequencies with a constant input voltage.

ANECHOIC: Without echo; a special room or 'chamber' with thick sound absorbing materials on all surfaces to prevent reflections.

ARM MASS: More accurately called *effective* arm mass, because it is *not* the weight of the arm on a pair of scales. It is the mass of the arm and cartridge combination that appears to be concentrated at, and thus felt by, the stylus tip which is tracking a record groove. There is nothing inherently good or bad about arms with light or heavy effective mass; what matters is the manner and choice of their combination with cartridges of different compliance and the low frequency resonance produced by such combination.

AZIMUTH: With reference to tape and cassette recorders, the alignment of head gap to tape path.

BALANCE: 1) The overall relative loudness perceived at different frequencies (eg bass, treble); 2) the accuracy of the match between the two channels of a stereo transducer (eg cartridge or pair of loudspeakers).

BANDWIDTH: A range of frequencies with presumed defined upper and lower limits.

BASS: Lower part of the frequency spectrum.

BELT DRIVE: The motor has its rotational speed geared down to the required platter speed (33 $\frac{1}{3}$ rpm for LP discs) by a rubber or similar resilient belt which runs round a small pulley on the motor shaft and a large pulley attached to or part of the platter.

BEXTRENE: A plastics material frequently used for bass and mid-range cones.

BIAS: (*turntable/arms*) Because the cartridge on a pivotal arm is being drawn across the record surface by the stylus tracking at an angle offset from the pivots, groove friction produces an imbalance of lateral force. Bias is the application of a compensatory lateral force acting in the opposite direction.

BIAS: (*tape*) This refers to a high frequency current passing through the record head which allows the audio current also passing through the head to produce reasonably linear magnetisation of the tape at all levels permitted by the combina-

tion of each machine with the tape. The lowest level of bias is required for ferric cassettes, a slightly higher one for ferrichrome, an even higher one for chrome or pseudochrome, and the highest for metal.

BOTTOMING: The stylus scraping on the distorted rounded bottom of the groove due to incorrect stylus geometry.

CANTILEVER: The thin rod or tube that connects the stylus to the armature and hence the cartridge body.

CAPACITANCE: An element of electrical impedance that is particularly important when matching pickup cartridge, arm leads and amplifier input characteristics to achieve a flat frequency response from discs.

CLIPPING: This is reached when a circuit is overloaded and overdriven, resulting in bad waveform distortion and audibly unpleasant effects.

COLORATION: A general term used to describe the audible effects of distortions, particularly in loudspeakers and record players. These are usually caused by frequency response irregularities and/or resonances.

COMPATIBILITY: The selection of interdependent components to achieve optimum system performance; notably arm/cartridge mass/compliance matching, cartridge electrical loading, or loudspeaker compatibility with amplifiers.

COMPLIANCE: A measure of the springiness of the cantilever/armature seen from the stylus, expressed in compliance units (Cu), where 1 cu = 10⁻⁶ cm/dyne.

CROSSOVER: An electrical circuit which uses combinations of inductors, capacitors and resistors to divide the signal from the power amp into the required frequency bands and with any necessary equalisation for feeding to the individual drive-units of the speaker system.

CROSSTALK: The leakage from one channel to the other in a two channel stereo system.

CUTTER: Mechanism used to cut recorded signal onto lacquer master; consists of turntable, lathe, cutting head, cutting and servo amps.

DIN: German standards body, responsible amongst other things for a popular range of standard plugs and socket specifications.

DAMPING: A means of controlling resonances by means of a resistive medium (electrical, mechanical, or acoustic depending on situation).

DECIBEL (dB): A logarithmic unit that is convenient for expressing ratios that span a wide range on a linear scale. For simplicity it can be regarded as a measure of relative loudness.

DISTORTION: Literally this can mean any deviation from the original, but usually refers to harmonic rather than intermodulation distortions when not specified.

DOLBY: Covers various signal processing/depressing systems, but normally refers to the B & C noise reduction systems used in cassette record/replay, and the B system used for music-cassette replay.

DOPING: A technique involving the application of damping to a loudspeaker driver cone in order to assist in controlling resonances.

DOWNFORCE: The weight, measured at the stylus, which holds it down in the groove.

DRIVE UNIT (DRIVER): The term used to distinguish the loudspeaker unit itself, be it bass, midrange, treble or fullrange in application, from the complete loudspeaker system which combines drive units, cabinet and crossover into a total design.

DROPOUTS: Momentary reductions of programme level due to inadequate head/tape contact caused by oxide particles shedding off the tape onto the head gap, or inadequacies in tape transport or tape.

DYNAMIC RANGE: The ratio in dBs between the quietest sound that can be successfully recorded and the loudest which can be accepted without serious distortion on an average programme.

EFFECTIVE MASS: The inertia, or mass-controlled resistance to movement, of a device, particularly important with regard to tonearms.

EFFICIENCY: The amount of acoustic power delivered for a given electrical input power.

ELECTROSTATIC: A principle employed in some loudspeaker transducers using static electricity effects to set up a polarising field within which the modulated transducer medium moves.

ELLIPTICAL STYLUS: A specially shaped stylus profile that makes the 'plan view' radius along the length of the groove smaller than the 'elevation view' contact radius viewed from the front.

EQUALISATION: (*general*) The deliberate modification of frequency response, usually in response to some engineering limitation or deficiency.

EQUALISATION: (*tape*) This refers to the necessary change in frequency response required of an amplifier so that overall flat frequency response is obtained from a tape medium. Equalisation is required both on record and replay. Any tape recorded on a good cassette recorder should have the same inherent response when played back on another correctly set up machine, since all playback equalisations should have been standardised. These standards are normally specified by the time constants of the circuits involved, eg 79 μ s or 120 μ s (see 'Microseconds').

FARAD: Measure of capacitance.

FM: Frequency modulated; often used to describe radio transmissions of high fidelity potential on the VHF band.

FARAD: Measure of capacitance.

FERRITE ROD: A short rod type aerial used for AM reception; may be fitted internally or externally to a tuner or receiver.

FERRO-FLUID: A magnetic fluid which is introduced into the voice-coil gap to provide damping and/or improved cooling.

FILTER: A circuit (normally) used to restrict the bandwidth of a system; may be fixed or switchable.

FREQUENCY RANGE OF SPECTRUM: Can refer to any particular group of frequencies, but commonly applied to the audible band from 20 to 20,000 cycles per second (Hz), extending from the deepest bass to the highest audible harmonics.

FREQUENCY RESPONSE: The variation in output over a frequency range, particularly of a transducer; can be expressed as a range with decibel limits, or depicted graphically.

Hz (HERTZ): 1 Hz = 1 cycle per second and is a measure of frequency which corresponds to musi-

cal pitch (the higher the frequency the higher the pitch).

HF: High frequency.

HARMONIC: Harmonics are the whole number multiples of a base frequency called the *fundamental*.

HARMONIC DISTORTION: The addition of unwanted harmonics to a signal.

HUM: A low frequency interfering sound produced by break-through or interference from mains wiring or circuitry.

IHF: American Institute of High Fidelity, an important standards body.

IEC: An international standards body.

IMPEDANCE: Measure of resistance (and reactance) in alternating (ie audio) signals; this is of some importance in the compatibility of both cartridges and headphones with amplifiers. For convenience sake is measured in ohms.

INTEGRATION: Used to describe the success with which the output from two drive units combine to give smooth output through the crossover region.

INTERMODULATION (IM): A form of distortion arising from two or more signals producing non-harmonic signals that correspond to the sum or difference of the two frequencies.

KILO (k): prefix meaning one thousand.

LED: Light Emitting Diode; an indicator light.

LF: Low frequency.

LATERAL FRICTION: The resistance to movement of an arm and cartridge combination in the horizontal plane (ie across a record), caused by friction in its bearings.

LINEAR: A transducer that produces an output that exactly portrays its input over the required operating range is described as linear, and is hence distortion free. Hence also nonlinearities (distortions).

LINE-CONTACT: A special stylus profile that extends the ellipse, increasing contact length up and down the sides of the groove.

LOAD OR LOADING: The impedance (including resistive and reactive components, ie ohms, mH, pF) seen by one component looking back to its interconnected component; of importance in compatibility of cartridge/amp, and amp/headphone.

'LOUDNESS': An equalisation circuit frequency switchable on amplifiers which is designed to compensate for presumed hearing characteristics at low listening levels by boosting bass and treble.

MOL: Maximum operating level of tape normally referring to 5% distortion of 315Hz or 3.15kHz.

MEDIUM WAVE: An AM transmission band incapable of high fidelity signals.

MICRO-(μ): Prefix for units meaning one millionth of.

MICROSECONDS (μ s): The time constant of a resistor capacitor combination involving a frequency response change (equalisation).

MIDRANGE, MIDBAND: The central part of the audible frequency range where the ear is most sensitive.

MILLI- (m): Prefix for units meaning one thousandth of.

MODULATION: The audio signal is 'stored' by means of modulations within a medium, eg the 'wiggles' in the groove of a plastic disc, or the

magnetic coding on a tape.

MODULATION NOISE: An additional noise added to tape noise, which increases with the degree of modulation of the tape, caused by the properties of the magnetic coating. This noise has most of its energy near the modulation frequency (causatory tone).

MOVING COIL: A transducer (eg cartridge or headphone) where the signal is generated by the movement of a coil within a magnetic field.

MOVING MAGNET: The most common form of cartridge transduction, where the magnet moves while the coils are held relatively stationary.

MULTIPLEX FILTER (MPX): A circuit which introduces severe attenuation at supersonic frequencies to decrease interference encountered with the output from some stereo FM tuners.

NANO (n): Prefix meaning a thousandth of a millionth of.

NOISE: Random unwanted low level signals.

NOISE MODULATION: An unwelcome breathing effect that can be heard on some programme material, produced by poor noise reduction systems, or circuits.

OCTAVE: Two-to-one ratio of pitch or frequency.

OFFSET ANGLE: The angle measured between the centre line of the pickup cartridge and the line which joins stylus and arm pivot point.

OHM: Unit of electrical impedance (including reactance) or resistance; also kohm, where 1 kohm = 1,000 ohms.

OVERHANG: The extent to which the cartridge stylus extends beyond the centre of the platter is critical, and controlled by fore and aft adjustment of the cartridge on the arm.

PASSIVE: The most common type of system, where drivers and crossover are driven from a single power amplifier.

PEAK RECORDING LEVEL: A level above which distortion becomes apparent. This distortion is introduced when the oxide particles almost reach magnetic saturation, and thus will accept no more level.

PHONO: The most commonly used plug/socket combination in audio components.

PICO (p): Prefix meaning one millionth of a millionth of.

PORT: An opening in a cabinet which is tuned to characteristics of the bass driver and the enclosure volume to provide reflex type bass-loading.

POWER AMPLIFIER: The part of an amplifier that provides power to drive the loudspeakers: usually integrated, it is sometimes a separate component.

PREAMPLIFIER: The part of an amplifier that accepts the input signals, sorts them, applies any necessary equalisation, and then passes the signal to the (normally integral) power amplifiers.

PRESENCE: A quality of forwardness or immediacy in a sound balance, generally related to an upper-middle frequency response boost.

PRINT-THROUGH: A pre- or post-echo of a loud signal created by magnetisation occurring from one layer to an adjacent layer after the tape has spooled or been recorded.

Q: A measure of the magnitude and shape of a resonance; the higher the Q, the sharper and more severe in amplitude the resonance.

REFLEX: a system of bass loading (using port or ABR) which offers improved efficiency and bass power handling at the expense of subsonic control compared to a sealed box.

RUMBLE: The low or medium frequency sound produced mechanically by any moving parts in a turntable, mainly the motor and platter bearings.

SENSITIVITY: The volume of sound output for a specific electrical voltage input.

SEPARATION: As between the two channels of a stereo pickup; see *crosstalk*.

SHIBATA: A special stylus extending the elliptical to a 'line-contact' type of profile.

SIDE-THRUST: A force acting on cartridges in pivoted (ie not parallel tracking) arms, due to the stylus/vinyl 'friction' acting along the line of the offset angle; hence bias or side-thrust compensation.

SIGNAL-TO-NOISE, SIGNAL/NOISE, S/N: The difference in total output when an applied signal is removed.

STYLUS: The specially shaped piece of diamond in contact with the groove and connected to the cantilever.

SUBSONIC: Below the audible range, ie below 20Hz.

SQUARE WAVE: A signal which consists of a fundamental plus a (theoretically infinite) series of odd (3rd, 5th etc) harmonics in a precise phase and amplitude relationship. It is useful for examining transient performance, symmetry, resonance control and 'ringing'.

THD: Total harmonic distortion.

TRACING: The following of the groove modulations by the stylus; hence for example tracing distortion, caused by the inability of a spherical stylus to trace the high frequency inner grooves on a disc.

TRACKABILITY: The ability of cartridge to cope with large amplitude modulations (or of the arm and cartridge to follow the groove itself properly).

TRACKING ERROR: The discrepancy between the truly tangential angle at which a record is cut and the slightly off-tangential angle at which it is tracked by a stylus on a pivoted arm during some parts of the arm's travel.

TRANSIENT: Signal of very short duration.

TREBLE: Upper part of frequency spectrum, typically above about 3kHz.

TWEETER: A small drive unit designed to operate over the high frequency range.

ULTRASONIC: Frequencies above audibility, ie greater than 20kHz; also *supersonic*.

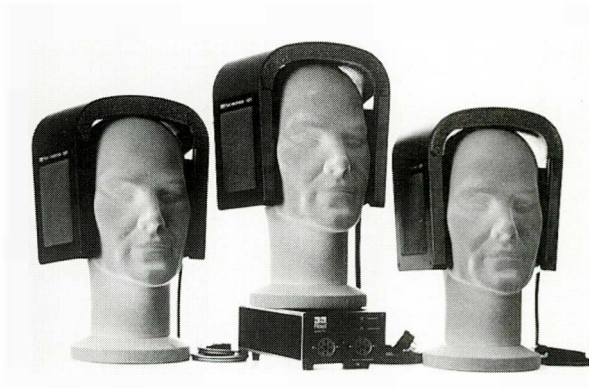
VERTICAL TRACKING ANGLE (VTA): The angle at which the plane of motivation of the stylus is set with respect to the vertical when viewed from a side elevation of the cartridge. Should match the 20° cutter standard.

WEIGHTING: A factor or function that is applied to a measurement to increase its relevance and usefulness.

WOOFER: A drive unit that operates over the bass portion of the audio range.

WOW AND FLUTTER: Low and high frequency pitch variations (from poor tape transport of turntable platters with speed drift).

Float



JJ FLOAT I - JJ FLOAT ELECTROSTAT - JJ FLOAT II

One of the stated design aims of the Float was that it should provide maximum user comfort and an absence of listener fatigue; in this area they are certainly an unqualified success.

(Hi-Fi Review)

With the Floats I found I could have the volume I desired – sufficient to retian the music's Impact – but without the normally attendant headache afterwards.

(Hi-Fi Review)

● “The ELECTROSTAT opens a new world of sound, more precise and realistic, than any other headphone.” **(Gramophone, England)**

● “Listening to music and forgetting that one is wearing a JECKLIN FLOAT, a top model for an affordable price. If one considers, on top of that, the extraordinary physical and psychological values, one can say that the JECKLIN FLOAT II is a best buy. It is a headphone for people who hate headphones.” **(Audio, Canada)**

DCC-1 DIGITAL CONTROL CENTER



This control center offers complete audio tape dubbing, and complete video signal routing for dubbing, as well as digital signal switching for the processor input.

(I A R)

This superb imaging enriches the musical presentation by framing it in a huge space (with rich ambience, depth, and width).

(I A R)

If you have need of a multimedia control at a reasonable price, you might consider buying the DCC-1 primarily as a control center, and view the on-board digital processor as a bonus.

(I A R)

The back is a socket-freak's dream containing no less than 20 pairs of phonotype gold-plated sockets to cover all analogue inputs and outputs, co-axial digital inputs and outputs and VCR monitoring.

(Hi-Fi News & Record Review)

Just as a line-level analogue pre-amp, the DCC-1 offered Lietz like trans and detail.

(Hi-Fi News & Record Review)

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Totally wired

*Want to listen to your hi-fi in the bathroom or kitchen?
Steve Moore, of leading multi-room installers The
Cornflake Shop, describes what you can achieve.*

As the range of home electronics available gets more diverse, it gets more complicated. And peoples' desires become more ambitious. An increasing number of people want to link up their audio and video systems, and with NICAM stereo and surround sound processors available, this would seem to be a sensible idea. Many people would also like to have music wherever they may be in their homes.

There are currently a number of multi-room audio/video systems available, giving you complete control over your hi-fi and video via a keypad on the wall or a hand-held remote control, from any room in the house. With these systems you can set the volume for the room you're in, or select the music you want, without going back to the system itself. You and your family could even listen to different music in different rooms at different volume levels! These systems should be able to give you good quality sound and video wherever you want it, in a way that is simple to operate and understand.

A good multi-room dealer will be able to link all manner of audio and video equipment, ensuring that it all works together, without intruding into your home.

Hidden cables

At their best, multi-room systems can give sound quality comparable to any high-end hi-fi system. At worst they won't work properly, and you'll get muzak piped around your house through a few car speakers whacked into the ceiling. If you're planning to spend thousands of pounds on refurbishing your home, and if you also want to get the best from your future sound and video system, then you should involve the audio consultant and installer in the design process at the earliest possible stage. Even the very simplest (and cheapest) systems can benefit from this - you can conceal all the wiring, ensure the TV cabling is planned so that you can watch videos all around the home, and maybe even build some loudspeakers into walls and ceilings.

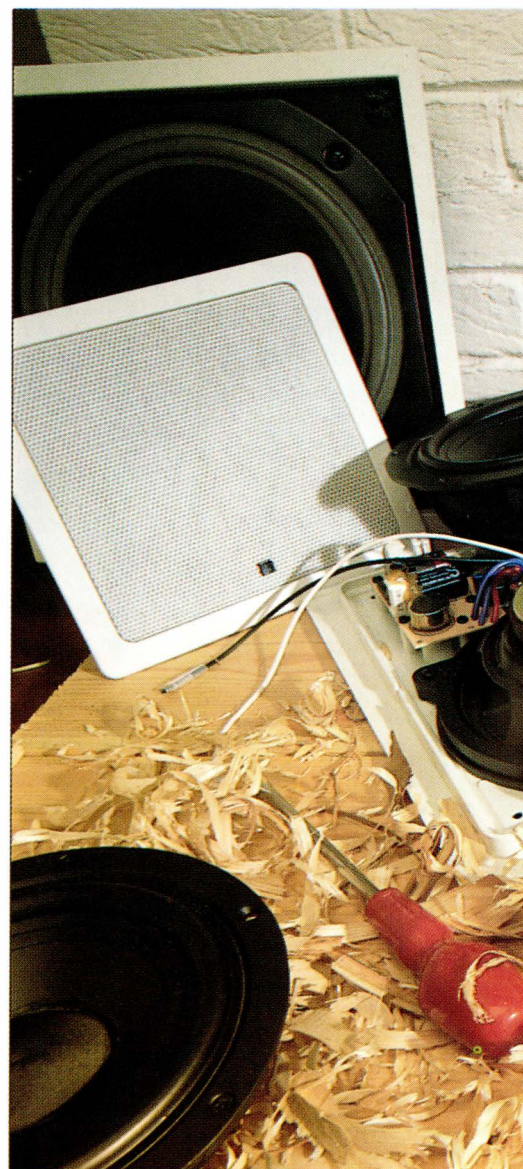
The consultant will also come up with

a specification for space, power and ventilation needs at the equipment site itself, and talk to the designer about acoustics and speaker positions in the various rooms. Bear in mind that any cabling work at the building stage (ie before the decorators arrive on site) will always be much simpler (and therefore much cheaper) than the equivalent cabling work later on.

Don't bodge

Clearly this isn't always possible - if you're fitting a system into an existing house, you'll either have to use an installer with the necessary building skills (plastering etc) or put up with a certain amount of surface wiring. We have installed systems in some very old properties (including an 11th century stately home) and managed to match the original plasterwork and conceal all the cabling, much to the owners' astonishment, but it did result in a pretty substantial labour bill.

Cabling is, I'm afraid, a necessary evil. Although some remote controls use RF



(radio frequencies), most systems rely on infra-red handsets, or fixed keypads, which need cabling from a local sensor point (in the room) back to the main system. All systems currently available need speaker cabling.

This leads to my first big *don't* - don't let the electrician or builder convince you that they can do the necessary wiring. Always consult a specialist - many multi-room installers won't charge you for discussing your basic requirements (either with you or your architect or designer), or producing a quotation, unless you decide to buy a system from them. Take advantage of this - canvass ideas and opinions. I've been called in on many jobs where the client was told by his builder that the house had been "wired for sound", only to discover that the electrician had daisy-chained some mains cable around a few rooms - fine if you want fairy lights, or a mono PA system, but not much good for

Fill your cavities with this lot and you'll be wired for sound.

a remote-controlled sound system. If the cabling is selected correctly, run properly to each location, and checked by the audio installer, you will avoid any problems when the system is installed. We used to subcontract some cabling work to on-site electricians, but no matter how carefully we explained what we wanted, and no matter how good the wiring diagram was, they would always take short cuts. For example, running signal cables alongside mains cables undoubtedly saves time, but it often causes hums and noise in the system later on.

Thinking ahead

A final word about cabling (and this time a big *do*) - do ensure that when you have wiring work done, it takes account of future possibilities. The best multi-room systems are flexible, and will allow the system to grow with you. Even if you don't fit loudspeakers in some rooms, take cables to a convenient point (just leave them in the ceiling or wall cavity if you are using built-in speakers) so that

you can pick them up if you want to. Also have a thought to the future, when you sell the house - you may not want a TV point in the kitchen, but what about the next occupant? Many of our clients insist that every contractor, including ourselves, produces all the relevant documentation on the project, so that they have a complete manual for their home. This is a great asset when selling. Even developers and builders are waking up to the possibilities - in these days of high-interest rates, when double poll tax is chargeable on vacant properties, any added feature or added-value (such as multi-room cabling or cable TV) makes *their* property more likely to be sold.

Pick a good dealer

A good multi-room installer will advise you on the possibilities and alternatives. But how can you tell that he can do his job properly? How can you ensure he won't wreck your dream home? You should check his credentials - ask him to show you a portfolio of work already completed and speak to his existing clients if you can. What skills do the installation engineers have? Can they make good plasterwork and paintwork? Does the dealer have listening facilities where he can demonstrate the equipment? Be sure that he can offer a fixed price quotation, including labour and cabling. Occasionally, on very unusual projects, it may be necessary to be charged on a time and materials basis, but most clients feel happier with a fixed price for an agreed specification. What about a specific instruction manual for your system, wiring diagrams, guarantees etc? How quickly will the dealer be able to sort out problems in future? Has he got the ability to work with other professionals (architects, interior designers) as well as the workmen on site? Can he supply diagrams and drawings? What if you don't like the sound when it's all installed?

You must ask yourself all these questions. Contact a few dealers, or encourage your designer to do the same. We have built up good relationships with a number of designers and architects over the years, but it does take time to earn their trust and respect, so their recommendations should carry some weight.

This kind of system doesn't come cheap, so you want to be sure that the dealer will still be around if you need any maintenance on the system. And it's important to investigate the after sales backup. Many multi-room jobs are a long distance from the dealers base, and some queries clients have can be sorted out over the phone, provided the dealer knows the system well enough. Service calls from multi-room clients can be a bit like a cross between *Treasure Hunt* and *Cluedo* - the



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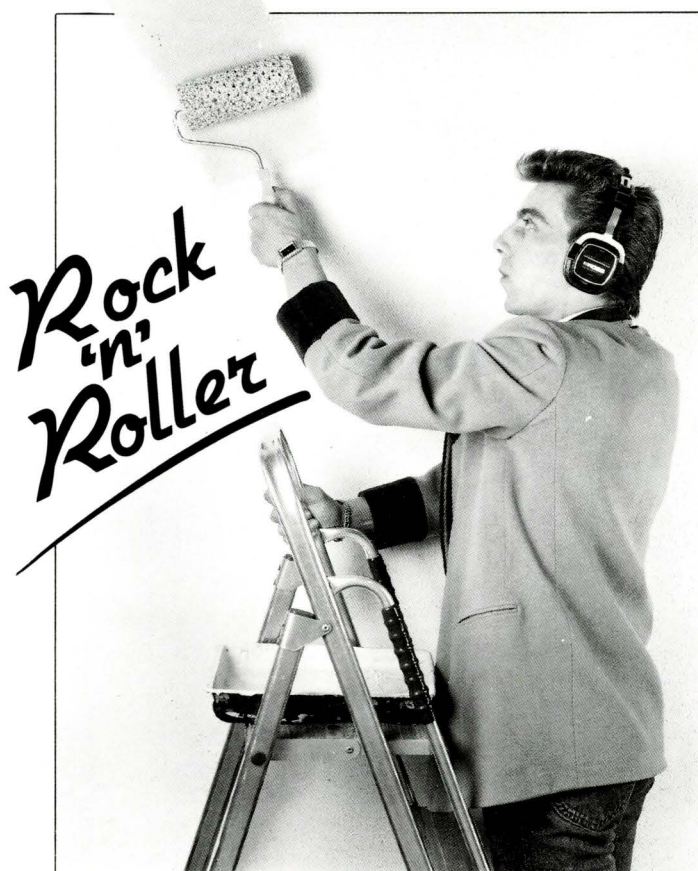
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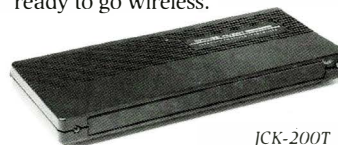


The Koss JCK-200 Wireless Headphones

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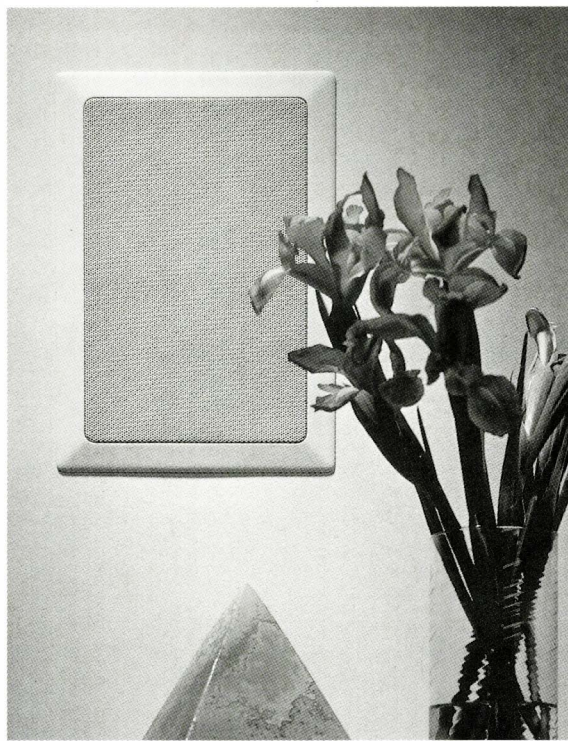
client might say something like "When I turn the radio on in the dining room and go to the kitchen, I can't change channels" and the dealer will need to know what the client could do to rectify the problem. Explaining this to the client is like telling Anneka Rice how to get to the next clue. We keep all the original drawings and notes on file, along with Polaroid pictures of the main bits of the system, and the wiring diagrams. It is a lot more useful for us to be able to say to the client "Push the right hand button on the top unit on the left", than "Find the controller for Zone 1, and reset it". Check that the installer can offer on-site back-up within an agreed period. Does he have a call-out charge for warranty work? Does he offer a maintenance agreement after the original guarantees have expired? Speak to the dealers about these matters.

Simple systems

There are broadly three different types of multi-room system. In almost all cases the bulk of the equipment (source components, amplifiers etc) will be housed together in one position, perhaps in a sturdy cabinet, or a separate media room, with cabling to speakers in each of the rooms that you want to listen in. This is the case for video as well - satellite or cable TV controllers, and VCRs, are often sited with the main system, with cabling to TVs in each room. At the simplest level of system you can run sound around the home, with a volume control (attenuating the level of signal fed to the speakers) in each room. To change radio stations, or change the source you are listening to, you would need to return to the system itself.

The next stage is to add remote control to this - so that you can control what you're listening to either by way of a keypad mounted on the wall or in a cabinet, or by using a hand-held remote control. In both types of system described so far, you must listen to the same sound in different rooms, albeit at different volumes. This means that any command you issue (change track on CD, volume up etc) will have equal effect for all the rooms.

The next level up is to split these rooms into different zones, by using a different controller for each zone - by sending the audio signals from each of your sources (CD, cassette, FM etc) to a number of controllers, you can route different signals to different amplifiers, and on to different rooms. The controller fulfils the role of the preamplifier in a conventional system - switching between the sources, and modifying the output (volume, tone)



Now you see it, now you don't. No messy wiring, and no black boxes.

in various ways. In addition to its preamp role, the controller plays another part - it sends the data signals received from the various rooms on to the source equipment. Some manufacturers have a number of controllers built into one piece of equipment, whereas others supply them individually.

This last type of system, a multi-zone system, opens up a number of options to the user - it's at this stage that you can listen to different music in different rooms. Also, whereas in the second type of system you could set the relative volume level between rooms (back at the amplifiers themselves), whenever you turn the volume up in one room (using the remote control), it rises in every other room simultaneously.

Obviously the ultimate configuration would be to have each room as a different zone. In practice this rarely happens. Kitchen and dining room are often configured as one zone, master bedroom and bathroom as another. We often supply four or five zone systems, but rarely any more than this.

Protect your sources

Before I discuss how the individual rooms are planned, there is one more level of flexibility to discuss - extra source components. A typical system might have five main source components - CD, cassette, FM, sound from the VCR and a turntable or multidisc CD player. If one person is listening to the radio in the kitchen, and someone else is listening to the CD player in the living room (which may well be in a different zone), all is well and good. But say the second listener wants to switch to

the radio to catch the cricket commentary - if they need to change channels to hear their programme this may well disturb the first listener (catching up on *The Archers*) because there is only one tuner. There are a number of ways to get around this problem. The first solution is to buy a separate tuner for each zone where this situation may arise (this clearly adds to the cost). Some manufacturers have devices to prevent this problem occurring - in some cases they build in a priority so that the first listener to switch to a particular input retains control

(you could control volume in the second zone, but not the functions of the device you are listening to).

Other manufacturers incorporate a display into their keypads or remote sensors that indicates what is going on in other zones, so that later listeners are discouraged from interfering. We find that in practice some people need to have the flexibility of additional sources or restricted control - they may want to feed a signal from the main system to a child's bedroom, for example, allowing them to listen to the various sources, but they may want to disable the control aspects of the system, so that the child can't disrupt other peoples listening. Often they may wish to add a local source (cabled back to the main system), such as a second VCR or cassette deck, in some rooms.

Aim high

Another *don't*. Don't forget to explore all the possibilities - some of your dream ideas may be possible! There are a variety of outdoor (ie waterproof) speakers available, and we've recently discovered some excellent-sounding loudspeakers (designed for use in synchronised swimming) that can be built in, beneath the water level, in swimming pools. You should investigate surround sound systems and ask about High Definition TV and Super-VHS if you watch a lot of television. The current vogue in the USA is for dedicated "home-theatres" just for watching films and TV! If you have a CD player in your car, or plan to buy one, it will probably be one of the multidisc types, taking either a six- or ten-disc magazine.

With this in mind, a lot of our multi-room clients buy a multidisc player (in addition to a much higher quality single disc model) so that they can compile se-

lections for the car. They also use this for continuous background music for parties and so on.

Now that you have some idea of what is possible, and how these systems work, you should try and construct a reasonable brief for the dealer. This may well change, but get an idea in your own mind about where you want sound, which rooms need the best sound etc. You may want TVs in a number of rooms, and you may want sound, but not necessarily remote control in other rooms. Think about how you might split the system into zones.

Think out the details

Here are a few more hints. Try and allow for a keypad near the front door, or garage door, so that you can turn the whole system off when you leave. Try and ensure that the power amplifiers switch on automatically when that zone is turned on, as this avoids overheating. Try and allow a fair amount of space near where the equipment is to be situated, so that there is easy access for maintenance and adjustment. If the furniture that stores the equipment is to be built in, allow space to pass cables back and forth. If the furniture is free-standing, ensure that the cables terminate in sockets, or pass through wall plates at the rear of the unit.

Think about storage for videotapes and discs and cassettes - they take up a lot of space, and need to be easily accessible. A final point - the new breed of intelligent remote controls can prove very useful. These are able to control most of the multi-room systems, as well as any local equipment such as VCRs, TVs and even remote controlled curtains and lights! Two more *dos* - do make sure that speakers used in bathrooms and kitchens have been waterproofed, and do use keypads in preference to hand-held remotes in those same (wet) areas.

Choosing the components

Why have I left this until near the end? Only when you have a good idea of what you want the system to do, will you be able to make decisions about what is best for you. There are a number of manufacturers producing multi-room equipment including Meridian, Audio Access, QED, Revox, and Bose. Each system has its own strengths and weaknesses, and some are better at working with equipment from other manufacturers (your existing equipment for example) than others.

Bear in mind that your dealer will have experience of a few systems, and his preference may be for systems that he has

most experience with. This means that he should do a better job installing those systems he likes. Some of the equipment is best hidden away, but some other items are beautiful enough to be displayed. You will want to be sure, for example, that keypads match your light switches so far as possible (as they will end up nearby) or that they are pretty enough to be seen elsewhere in the room.

There are now a lot of manufacturers making quality in-wall speakers, including Sonance, Kef, Meridian Boston, and Infinity. Most of these can be painted to match the surrounding surface, some come with cloth grilles which can be dyed to blend in with fabric wall-coverings.

Configuration

Once all the cabling has been done, and the house is almost ready, with carpet in place and decoration complete, the source equipment, amplifiers, and any free-standing speakers can be installed. This is when the tonal balance, speaker positions and the relative volumes between rooms can be set. This is when the intelligent remote controls can be programmed for each area, and when you should be present so that the system can be fully explained to you.

You should check that you receive all the instruction manuals, and better dealers will produce a personalised "idiot guide" explaining the basics of your own system, along with emergency phone numbers in case you do get things in a tangle (you don't want to look totally incompetent in front of your guests!). This said, the best systems should be worked intuitively, as you would expect at first

sight, and any teething problems should be sorted out in the first week or two.

You must now be aware that, provided you plan things carefully, and involve the dealer and consultant at any early stage, there is no reason that you shouldn't get a wonderful round-the-house system, exactly tailored to your needs. You should understand that the labour element of the total bill may be quite a high proportion (between 10 and 40 per cent).

In return for this outlay, you should get worthwhile advice on room acoustics, ergonomics, the equipment and the system design. The cost of the cable itself may be substantial. The system should be flexible, and in most cases will be much better value than getting single systems for each room - by buying one set of very good quality source components, instead of a number of mediocre systems, the sound quality will be better too.

There is no reason why multi-room systems should be less reliable than standalone systems, and certainly no reason why they shouldn't sound as good. Let's dispel one final myth - purist systems and multi-room are by no means incompatible - we often supply a purist "hair-shirt" kind of system for the main room, and then send a signal from this on to the multi-room equipment that pipes the signal around the home.

Finally - cost. Well, we've supplied systems that fall within the broad description of multi-room from as little as £2,500, and for more than £30,000. We hear reports from across the Atlantic of installations costing more than £250,000, so clearly these systems are limited only by your imagination and your budget!



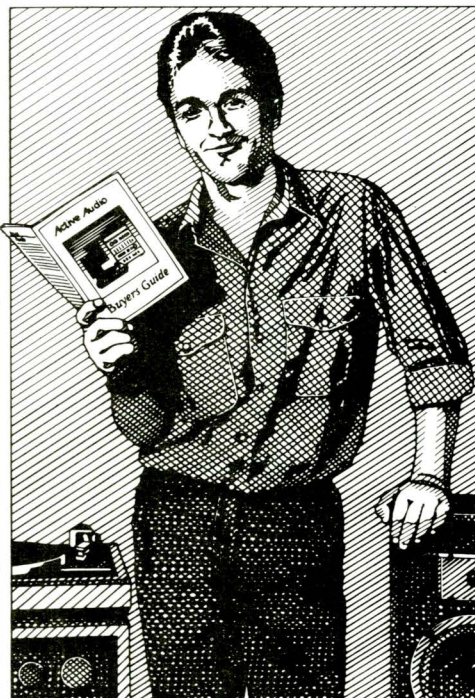
Out of sight, but not out of mind - remote control by infra-red handset.

The Right HI-FI can be a Source of Endless Pleasure

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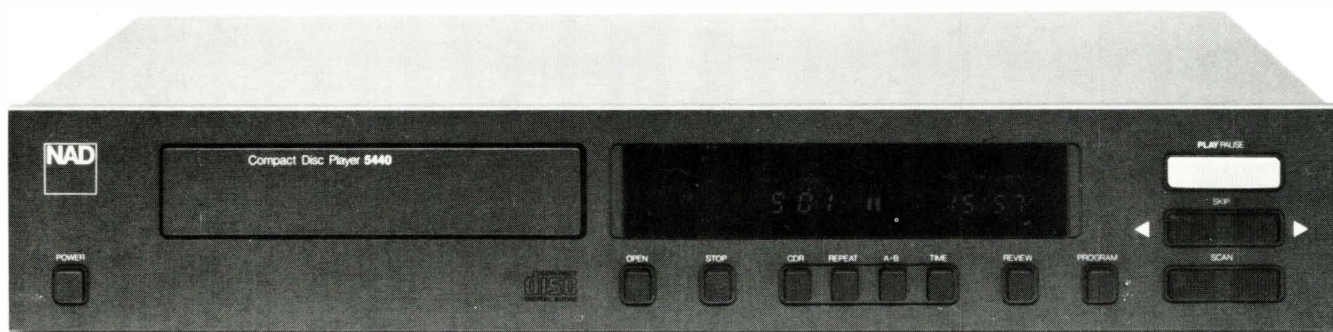
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Win a pair of Celestion ribbon loudspeakers!

Another month means another fabulous free-to-enter competition in Hi-Fi Choice. This month we're giving away three pairs of Celestion loudspeakers worth over £3,000. First prize is the £1,299 floorstanding Celestion 7000 while the second and third prizes are the new updated Celestion 5000 and 3000 speakers, including the tailor made Celestion K-stands. We're even including lead shot for mass loading.



How To Enter

Our simple hi-fi quiz requires six answers which must be written on the entry form provided. Fill in the form, remembering to include your name and address and send it to the address shown in bold type at the bottom of the form. Mark your envelope **Celestion Competition**.

The Prizes

The first correct entry drawn from our mailbag after the closing date will win a pair of Celestion 7000s worth £1,299, the second correct entry will win a pair of Celestion 5000s worth £839 and a pair of K-stands worth £159 and the third will receive a pair of Celestion 3000s worth £769 and a pair of K-stands.

The Questions

Please write your answers in the space provided on the entry form.

1. Which Celestion engineer pioneered the Celestion ribbon loudspeakers? (clue - see Issue 93)
2. Name a personal CD player that incorporates a digital output?
3. What is SME's turntable called?
4. Naim makes three loudspeakers, which is the cheapest?
5. The Celestion SL700 features an unusual cabinet, what's it made of?
6. Celestion revealed a brand new loudspeaker at the Bristol show, what's it called?

Entry Form

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POSTCODE: ME4 4UY TEL: 815110

HFC/MAY/91

Closing date: Monday, 3rd June, 1991

Your answers:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.. AEROLAM
- 6.....

COMPETITION RULES

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

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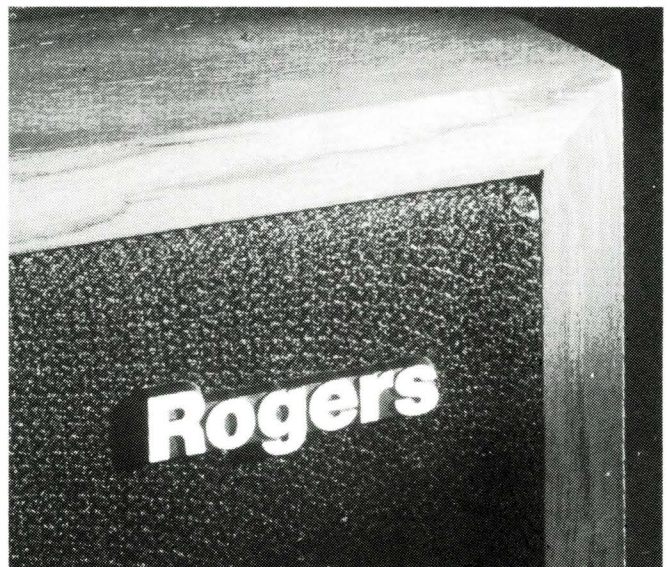
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Readers Write

CHOICE ANSWERS

The gramophone arms

I own an Ariston Pro turntable which is fitted with a Linn K5 MM cartridge. I want to fit a MC cartridge and/or change the tonearm. I have visited almost all of the "reputable" hi-fi shops but have been told by many a condescending assistant that it is impossible to replace the tonearm and that it is not worth my while fitting a MC cartridge.

As you can imagine this kind of attitude is very counter-productive to the efforts of someone whose aspirations are much greater than a student budget!

What I would like to know is whether or not it is worth my while fitting a MC cartridge - I was thinking of the Ortofon Quartz. I would also like to know whether it is possible and wise to replace the Ariston arm with a Rega RB300.

Khurram Hamid,
Kennington, London.

The Pro is not the sort of turntable that naturally lends itself to arm changes, but as it is

fundamentally similar to the Rega decks, you could probably fit a Rega arm. A degree of DIY expertise would be required to do the job well however. Remember that the effective lengths of the Rega and Ariston arms are different (the Rega is 9mm longer) and the mounting point may have to be moved, which would be messy and difficult.

We would not advise fitting a Quartz to the Ariston arm, one of the better moving magnets would be more suitable.

ExAspirations

One of the main reasons that I started buying *Hi-Fi Choice* was to read the *Aspirations* feature. For the first few months it was very interesting and I enjoyed reading about expensive hi-fi systems (many costing hundreds of times more than my own). But reading the recent *Collection* illustrated how boring *Aspirations* has become. Instead of being about hi-fi systems that

Uncovering the best systems and getting people to talk about them can be hard work.



The Ariston Pro can be updated, but is it worth the effort?

readers might aspire to (like those in *The Collection*) it is about normal, middlemarket systems and relies on finding something interesting about the owners of the system. It's fine to interview Hugh Scully about his record collection, just don't call it *Aspirations*.

The worst one was about the sculptor who had cunningly concealed his small Technics system in a large plastic sphere and hung it from his ceiling. Great! I personally aspire to a Micromega/Absolute Sounds system, but I suppose that a Technics/Plastic Sphere must run very close. I am waiting excitedly for next month's feature on the lucky owner of an Amstrad midi system.

In my opinion, you should either track down someone with a really interesting system, (how about someone using an Audio Note *Ongaku*?) or accept that *Aspirations* is now letting down a great magazine and drop it quickly. Simon Bedwell, Harrogate, N.Yorks.

You've got a point, but try finding someone with a serious hi-fi system and a novel and interesting twist (star lifestyle/great house interior) who is prepared to have it invaded by the Choice Aspirations team for an afternoon. It ain't easy to find both; we've had to go to the other side of the globe for this

*month's piece on an OTT horn system in Tokyo. Last month we managed to combine both star quality and megabucks audio in Douglas Adams' sparsely furnished flat. As to *Ongaku*'s we've tracked down a pair of them - on a yacht in Japan - so watch this space.*

Loud heavy rock

Having progressed along the upgrade path I now have the following system: *Little Pink Thing/Tabriz/AT5F* record player, *Mission Cyrus Two/PSX* amplification and *Mission 700* speakers.

However, the speakers are nine years old and struggling to keep up with the turntable and amp combination. I am considering replacing them with one of the following alternatives: *Monitor Audio MA14*, *Musical Fidelity MC4* and *Linn Index* with *Ku-Stone* stands.

One point that concerns me is the effect that my sprung wooden floors would have on bass performance. I would be grateful for some advice on speakers bearing in mind that my musical taste traverses vocal, classical and loud heavy rock.

Also, are there any arm, cartridge or interconnect upgrades which would be noticeably beneficial for a reasonable cost? Ronnie Kennedy, Whitehead, Co Antrim.



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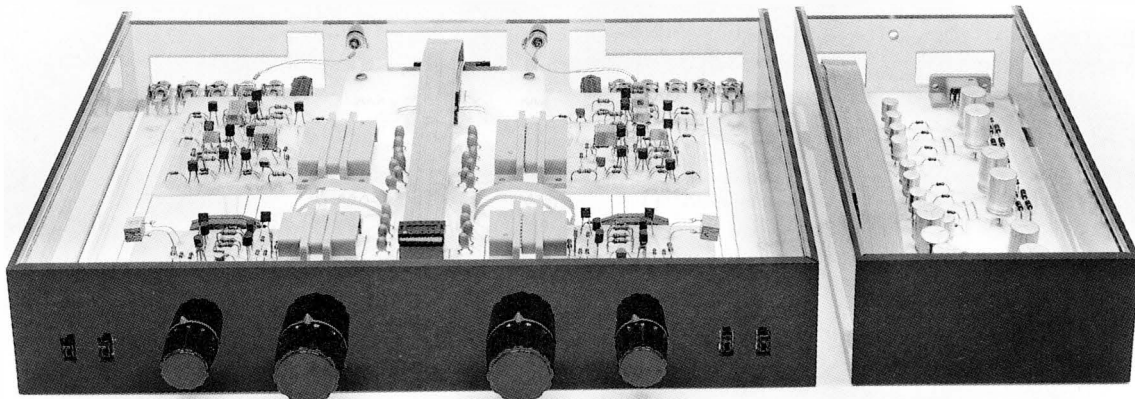
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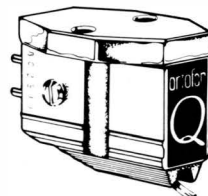
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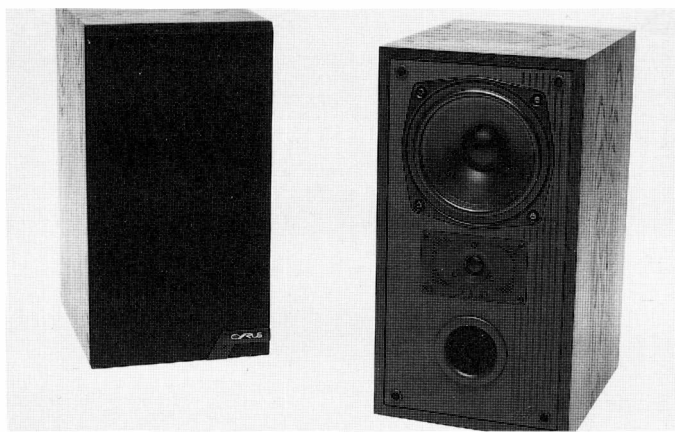
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Cyrus 781s can sound great once they have been run in.

We can narrow down your shortlist by mentioning that Musical Fidelity no longer produces the MC4, and can add a couple more alternatives before you arrange a demonstration. One of the £300 models in this month's test, the Epos ES11, is a particularly musical speaker that's well suited to analogue sources and should prove a good match. Alternatively if you prefer a 'faster' sound a well run-in pair of Mission Cyrus 781s might be preferable. Try to listen to these models.

There's not a great deal that can be done about sprung wooden floors without structural alteration, and if you want to avoid booming floorboards we suggest you avoid speakers that have particularly good bass extension, and experiment with stands.

With a front end such as yours there aren't really any inexpensive arm or cartridge upgrades that are worth pursuing, but it might be worth investigating turntable supports. Mana makes a £150 wall bracket that could make a significant improvement over the support you are presently using.

Why change ageing speakers if you like their sound?

Sales talk

I recently bought a NAD 6340 cassette deck to add to my existing system which comprises a Thorens TD166 MkII turntable with Thorens arm and Nagaoka MP11 cartridge, a NAD 3020 amplifier and AR18 speakers. I bought this system in 1982 and have been satisfied with it ever since.

However, when I bought the 6340 the salesman told me that my speakers are now well out of date and that I could get a much better sound if I replaced them with a more modern alternative. Was he right? If so, what model would you recommend?

Likewise, do you think an upgrade of my amplifier would be advisable? If so, which models should I try? And am I right in thinking that the record deck, arm and cartridge would remain satisfactory in an otherwise upgraded system? Thomas Lines, Brussels, Belgium.

On the one hand the salesman was right; the AR18s aren't particularly competitive by modern standards, but on the other hand you've got a nicely balanced system that you enjoy and gives you good service. You could of course get the system to sound more transparent, dynamic and detailed but unless you're dissatisfied with what you've got there's no real reason to do so. It's not quite the done thing to say so, but higher fidelity doesn't necessarily mean greater musical enjoyment.

By all means listen to some of the speakers we recommend in The Directory, but if you're happy with what you've got spend your money on vinyl, and help maintain the record companies' interest in the medium.

Roksan Interconnect Winner

Digital boogie blues

At the moment, my system consists of an old Luxman T-2 tuner, Denon DCD-810 CD Player, Mission Cyrus One II amplifier and a pair of Wharfedale 505.2 speakers. The system is linked up with QED Incon P2 Gold cable and the loudspeakers are fed via 5m of Mission Cyrus solid-core cable. The whole caboodle sits in my study-bedroom, which is a miserable shoebox. The introduction of QED TS22 Tristands has sharpened up the bass, giving it more life and tune — potential that the Wharfedales are very capable of (is this what Paul Messenger means by "boogies"?). However, the bass still lacks the fundamental pace and quality that the jazz I listen to demands.

Listening to my brother's system (Marantz CD60SE, Cyrus One, 505.2s), I noticed more deficits in my system. The Denon seems to compress the stereo image somewhat, and to add insult to injury, the images are blurred (especially on Michael Hedges' *Strings of Steel* — the tactile quality of his fingers on the strings is all but lost). There is a fundamental lack of 'air' and ambience which frustrates me, especially when trying to listen to live jazz recordings which rely very much on the ambience clues to paint a convincing aural soundscape.

The lack of a digital output on the Denon leaves me with no option but to replace the CD player. What would you recommend? My criteria are; articulate bass, midrange transparency and a civilised treble to cope with the demands of a jazz combo. Stereo imaging and depth is important to place the players in the correct perspective. My budget is severely restricted but I will consider spending up to £300. Would bitstream serve me better with its sweet treble and precise soundstage or will multibit designs offer the dynamics and pace I'm after? It all seems very confusing. Johan Khoo, Epsom, Surrey.

It sounds as though you want the best of both digital to analogue conversion systems. Unfortunately the results you are after have so far only really been realised in very expensive machines like the Marantz CD12 and Micromega Trio. However, having spent some time on the recent CD player blind listening tests it sounds as though affordable machines are getting remarkably good; they don't have the bass power of more substantial designs, but are very competitive in most other respects. Issue 95 will contain full reviews of 27 new players, we would suggest you use it as the basis for an auditioning shortlist and go do some listening in your local audio salon.



CD players are sounding better, but they still lack ambience.



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21st Century Fox

Barry Fox looks at the future of FM - and AM - stereo, and finds technology is no substitute for decent music . . .

I've never thought much of nationalised industries. Well, who could, after travelling on British Rail's Southern region? But in France it seems to work. The government-owned radio and TV research centre in Rennes does sterling work on improving reception.

FM Synchronie is a clever system, being developed for the Winter Olympics to be held at Albertville in France, and now under test near Rennes. FM Synchronie lets a car drive through the coverage area of two transmitters which share the same VHF FM frequency - without the interference which normally spoils reception in the region when the signals overlap.

The trick is to use digitally controlled FM stereo encoders to ensure that the two signals are always tightly locked together in frequency, ie synchronised. Then the car radio can receive from either or both at the same time.

If it works as well as the French claim, can we please have it in the UK, as soon as possible.

The decisions of rival AM stereo developers, Leonard Kahn, of Kahn Communications, and Greg Buchwald of Motorola, to stay safely at home in the USA instead of attending a seminar on AM Stereo in Europe earlier this year, as they had previously promised, prompted reminders of the lady who lit a candle for peace and set fire to her house. For Kahn and Motorola the decision to stay home backfired badly.

Europe is on the edge of AM Stereo. Two commercial stations, Radio Orwell in Ipswich and Capital in London, are already experimenting; stations in France and Monte Carlo are due to start soon.

At the recent Radio Academy Conference in London the issue caught light because the Radio Authority,

which took over from the IBA, is now offering licences to run national commercial radio stations. The cost of the licence is £1m, plus around £4m in transmitter fees. One network will be in the VHF FM band. But this station cannot play rock music.

The FM Independent National Radio station will have to be "non-pop". And pop is defined as anything post-1960 with a rhythmic beat which relies on amplification. (The government legislators worked hard on that definition). The soft rock station which most people want, and which might make enough money to stay in business, will have to be on AM. So AM stereo suddenly starts looking important.

The Kahn system works by transmitting the left and right channels as the upper and lower sidebands of the AM signal. Existing mono AM transmissions have identical upper and lower sidebands. So existing AM receivers sum the different sidebands of a Kahn transmission, while stereo receivers use them separately to produce left and right channel sound. Motorola's C-QUAM transmits the sum of the left and right channels by amplitude modulation of the broadcast frequency. So existing receivers receive mono. C-QUAM transmits its stereo information (the difference between left and right channels) by modulating the phase of the signal. A C-QUAM receiver mixes this difference signal with the sum to decode stereo.

Motorola is fast making C-QUAM the de facto standard in North America and Australia because the company is a microchip manufacturer and thus able to produce low cost decoder chips for use in receivers. The UK tests are with C-QUAM.

The European seminar was aimed at European broadcasters who are currently trying to decide whether or not to invest in conversion to stereo. Khan

sent written claims that his system occupies less bandwidth than Motorola's C-QUAM and that it gives a stereo image which is so much more stable that even his cat can hear the difference. The bandwidth claim was duly refuted in a fax sent by another billed but absent participant, Motorola's European representative, Lawrence Hallett of UK company Phoenix Communications.

I watched the audience sit bewildered at the crossfire of secondhand jargon. Then the one promised panellist who had bothered to turn up, Steve Katz, General Manager of South African AM radio station 702, recounted his personal experiences. In 1985 the station converted to C-QUAM stereo in an effort to win back listeners lost to a rival FM stereo station.

"It didn't work. We continued to lose listeners," said Katz. "In 1989 we stopped, and the only complaints we got were from some of the few listeners with stereo receivers who wondered why their red pilot lights had gone out. Even our own engineers were begging us to switch off the stereo encoder, to get a stronger mono signal.

"Our story has a happy ending, though. In 1987 we changed our programme format. We identified a niche market, the baby boomers, which the FM station wasn't serving. That worked." Summing up, Katz added: "We tried to solve our problems with technology and found we couldn't.

"AM stereo may make you competitive again if your competitor is in AM mono, but not if he's in FM. People listen to FM for the clarity not the stereo. It doesn't matter whether the Kahn system is better than Motorola's, or Motorola's is better than Kahn's. My advice to anyone who is thinking of relying on AM stereo is to think again. Look for a niche market instead."

There is one hidden benefit of AM Stereo which, along with the Radio Authority's refusal to license an FM commercial soft rock station, is why I mention all this in a hi-fi magazine. Over the years the quality of AM radio has gone far further down the pan than necessary. In a vicious circle, receiver makers have cut costs on their AM circuitry, and put all the set's value in the FM section. Radio stations have compressed their AM signal to make it sound better on bad equipment. A switch to AM stereo would encourage the radio stations to put out a better signal, and push the receiver-makers into spending more money on their AM circuitry. This would mean better reception for both mono and stereo.

Nice to see Technics sponsoring live music and not just dreary repeats of the same old safe symphonies. Technics plays patron to The Sixteen, a classy classical vocal group.

At a Sixteen concert of music by French composer Poulenc in St John's Smith Square, the audience got a sheet of the lyrics in the original French with English translation. To keep people on their toes the pages had been stapled together in the wrong order. But I finally cracked it and came to the conclusion that Poulenc was not exactly the world's greatest lyricist. Some of it sounded suspiciously like Ramblin' Sid Rumpole, with other verses more like the Rolling Stones.

I particularly liked this little ditty: "Let's go and send for the girls, Of course we shan't be short . . . Girls are made for housework and looking after the home, Yeah, but to make a marriage you'll need the boys alright". I wonder how the Radio Authority and Home Office would classify that lyric - pop or non-pop.

Uxbridge Audio

Dear Sir

Wembley Park,
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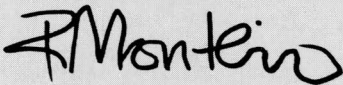
Having embarked on the daunting task of looking for the right music system I visited many Stores and purchased a lot of literature. I was attracted by your advertisement in What Hi-fi magazine. First class sound quality was my top priority and from another article in the same magazine I had made up my mind to purchase a system recommended therein.

A quick phone call to your Shop to find out whether you had them in stock and I was lectured on how a Music System should be purchased . . . "HAVE YOU LISTENED TO IT? HOW DO YOU KNOW YOU WILL LIKE IT'S SOUND? It isn't the same as buying a washing machine, when it has to be taken on faith that it will do the job as you want it. It is more like buying a musical instrument, where personal preference dictates. You do not need to be an expert, you only need to listen to it and decide for yourself . . ."

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

When I first read the letter from a satisfied customer in your advert I didn't think it genuine. But after my experience I know just what he meant. I echo him in commanding you and your staff and I will not hesitate to recommend you. I, once again, thank you for the help in choosing my system and the excellent service and attention I have received at and since it's installation.

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Choosing and Using . . . *Loudspeakers*

*Thinking of buying some speakers but don't know where to start?
Paul Messenger guides you through the maze of loudspeaker selection.*

The first step on the road to choosing your loudspeakers is to specify your personal and particular requirements. It is possible to do this on a basic, simplistic level checking the price, size and intended location. But there are real benefits for those prepared to take a little more trouble. With a little care, the assistance of the data in this issue, and (hopefully) the cooperation of a skilled retailer, the end result can be that much more worthwhile.

Those buying just loudspeakers will have a pretty good idea of the money they have available, which as ever is the fundamental bottom line of any purchasing decision. But there is - and always has been - controversy over the proportion of a budget that should be devoted to loudspeakers, vis a vis that spent on the other components.

Ten years ago conventional wisdom recommended devoting as much as possible to the loudspeaker, as it was regarded as the weakest link in the chain. An alternative philosophy, pointing out that the loudspeaker could do nothing to compensate for an inadequate source, switched attention towards turntables and amplifiers.

Setting a budget

When setting the loudspeaker budget, it is vital to allow sufficient funds for a decent stand or support, and good quality connecting wire. From £200, for example, one should probably allocate £140 for the speaker itself, £50 or so for stands, and maybe a tenner for the cables.

Where one listener may be barely conscious of the subtleties of stereo imagery, another will take particular pleasure in pin-pointing musicians within a recorded

acoustic. Likewise those who listen predominantly to electronic rather than acoustic instruments are liable to sacrifice coloration in favour of dynamic impact.

While a magazine can assist in presenting these alternatives, it is only through skilled demonstration that an individual can be confronted with the different but equally valid options to make an educated choice for himself. At the time of writing I am temporarily living with a £1,000 system which suits me very well, but which certainly represents one extreme. It consists of a £600 turntable with £200 amplifier and £80 loudspeakers on £100 stands. At the other extreme, another audiophile could enjoyably combine a £500 remote control multisource mid-system with £500 worth of high performance, low coloration loudspeakers and stands. But unless one actually has the opportunity to hear the difference between these two very distinct approaches, how can one possibly have any basis for making a choice?

Siting

The site chosen for loudspeakers is often as influential as the choice of loudspeakers themselves. Over the years I have used open stand locations, both with conventional box speakers and panel types, and also stand-mounted wallbacked designs. Each has its own strengths and weaknesses and imposes its own characteristics on the sound, so again personal preference enters into the equation.

Having chosen the siting, one may then choose the loudspeakers and stands to suit. Alternatively, choose the speakers you like in the shop,

and then move them around at home until they sound to your taste.

The end result comes from a complex interaction between the loudspeaker, its support, its site, the acoustics of the room, and the general characteristics of the driving system. That is rarely entirely predictable. For those intending to spend a fair amount of money, it is not unreasonable to expect the luxury of a home demonstration, and/or the option to return and change a pair which do not suit after a day or two.

For any given budget there is an obvious choice between large or small loudspeakers. One instinctive reaction is to favour the big one, particularly if it has lots of drive units, but others will plump for a miniature or compact on aesthetic grounds. In fact the differences and trade-offs are much more far reaching.

Bass extension

Fundamentally, the larger the box the more extended the bass is for the same specific loudness. Ultimately a good big'un is going to beat a good littl'un on loudness and bass extension, hands down. But it is also going to cost a great deal more. The large enclosed volume remains the route to extended bass, and this in turn adds 'weight' and 'scale' to the sound. But it can also reveal the low frequency inadequacies of the sources, be they the equipment or the recordings themselves.

Big speakers suffer from several innate disadvantages. Large box enclosures are expensive to build and ship, and represent an undesirably large surface area of unwanted radiation, which can colour the sound and blur stereo precision. Extra drive units do increase power

handling, but bring problems of crossover complexity and unit integration.

Little speakers can prove more fragile if used for the occasional party, and are certainly not at their best when trying to recreate the power and drama of rock or a full concert hall acoustic.

Given the excessive number of different models competing for attention, manufacturers are inclined to make much of the uniqueness of their particular brew. As a result the industry has become riddled with buzz words to describe any single type of engineering solution, and this leads to the sort of stereotyping which entirely misses the point of loudspeaker engineering.

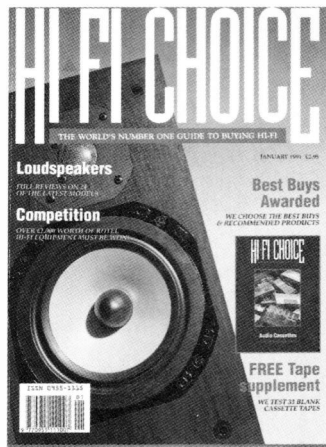
Examples are legion, from the bextrene bass/midrange cones of the early Seventies through to the latest metal dome tweeters which are currently springing up everywhere. The result is that people talk of a 'metal dome sound' as something desirable (or not) per se, whereas in fact there will be a whole range of different metal dome sounds, in all probability some distinctly more 'equal' than others.

The underlying axiom is that great loudspeakers are not created by adopting a quick technological 'fix'. Indeed, history has often shown that the 'radical innovation' is a mere flash in the pan, with benefits in one area more than offset by unforeseen penalties elsewhere.

Technology has steadily improved the performance of loudspeakers over the years, and some innovations have proved decidedly worthwhile. But the whole is much greater than the apparent sum of the parts, and the buyer would do well to bear this in mind.

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Allison AL100

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Roy Allison built a formidable reputation as a loudspeaker engineer back in the glorious past of Acoustic Research. Much of that tradition is reflected in the models that his own company has been building for the past decade or more, albeit modified by Allison's particular perception of low frequency room interaction. In that respect the brand must be acknowledged as the pioneer of close-to-wall siting, a trend that a number of the newer British brands have followed with significant success in recent years.

Hardly surprising in view of the shipping involved, American speakers tend to cost a little more than their British counterparts in the UK. However, thanks no doubt to the current state of the US dollar, that's not the case with these. The £109 AL100 is rather bigger and heavier than its obvious UK price rivals. That said, the half-a-dozen high performance miniatures that dominate the UK scene establish a remarkable standard of performance for the money. A US interloper is not going to find it easy to compete on the same terms.

Not surprisingly, presentation is prosaic, with a certain amount of painted chipboard edging around the rear. Still, the standard of finish is very good, and the grille is a neat shaped section of perforated plastic, better left in place as the heavily doped main driver cone is not particularly pretty.

The box feels pretty solid, helped by its squat shape and 19mm wrap, though the baffle is rather thin, and the rebated main driver uses woodscrews directly into chipboard only 5mm thick. The screws were reasonably tight, but I wouldn't have liked to try and tighten them properly.

The main driver has a small (115mm)

heavily doped fabric cone, and apparently has extra mass loading to lower its free air (and in-cabinet) resonant frequency. Such a technique is also liable to lower the natural HF rolloff of the driver, but Allison uses a lowish (2.5kHz) crossover point, so no matter. The tweeter is a simple plastic dome/annulus under a phase compensator, while the crossover is pretty minimal, barring a protection thermistor, hardwired and tag connected.

Test Report

The basic parameters show unusually good bass extension for such a modest loudspeaker. Part of the reason is found in the combination of slightly below average sensitivity (on our estimate, which cannot be precise given the response unevenness), and a resolutely low impedance characteristic. Choose a partnering amplifier with good current capability.

The overall balance is decidedly uneven, the exposed and forward midrange being the most striking characteristic. This tends to be less obvious when the speaker is fairly close to a wall, though it should not be placed too close or the midbass gets too strong; the lower mid remains lean throughout, and there's a clear discontinuity at the crossover with some loss of presence. The treble response is far from smooth.

Sound Quality

The AL100 did indecently well for a model of humble aspirations in the blind tests, albeit with some dissenters in the panel. A contributing factor might have been that the basic response defies attempts to match levels precisely with flatter designs, but in fact the actual setting used was

lower than most, so this is unlikely to have helped it.

The balance does tend to emphasise vinyl surface noise somewhat, the sound is a little heavy and uneven in the bass, with a rather forward and mildly mangled midband. But all bar one listener found the overall result fundamentally enjoyable. Timing is impressively coherent, and although the bass isn't genuinely defined, it doesn't waffle either, delivering a satisfyingly juicy 'thwack' that gives a surprisingly good sense of scale.

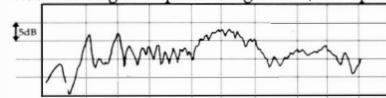
Conclusion

Not the most neutral or polite of the £110 miniatures, the AL100 is nevertheless most enjoyable in its rather rude and crude way. It beats most or all price rivals in its ability to give a very fair (if somewhat misleading) impression of a full size model, and that factor certainly merits a Best Buy rating.

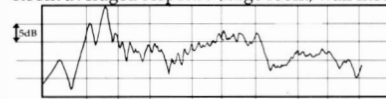
TEST RESULTS

Size (h x w x d)	33.5 x 24 x 21.5cm
Weight	5.5kg
Recommended amplifier power	15-75W
Recommended placement	stands 30cm from wall
In room averaged response limits 50Hz-10kHz	+/-6dB
Large room/space LF rolloff (-6dB ref midband)	40Hz
Large room/wall LF rolloff (-6dB ref midband)	30Hz
Large room output at 20Hz (ref midband)	-11dB
Estimated sensitivity (ref 2.83V, 1m)	87dB
Impedance characteristic (ease of drive)	current hungry
Typical price per pair (inc VAT)	£109

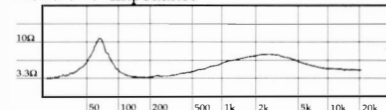
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



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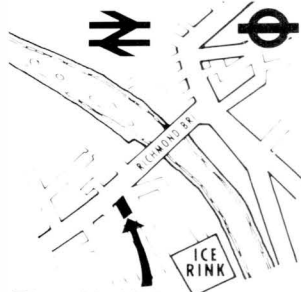
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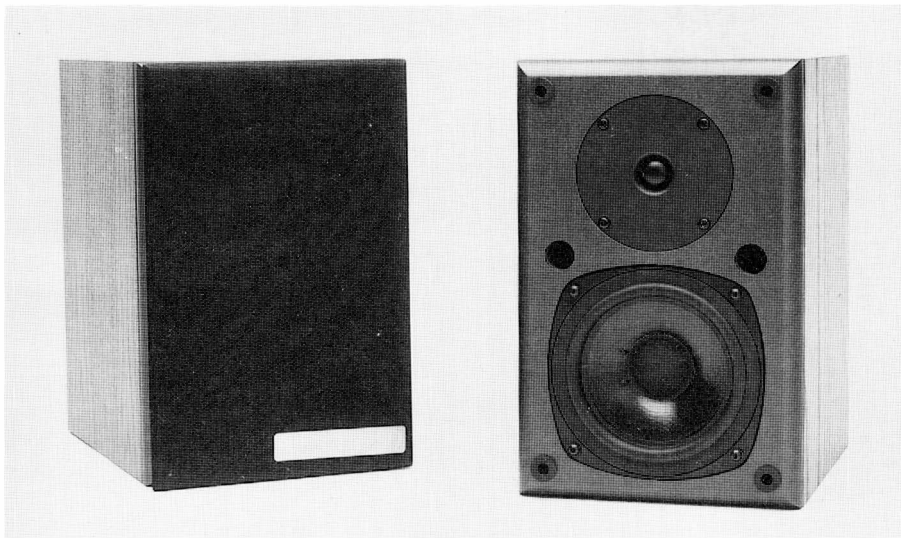
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Brand new designs do sometimes encounter teething problems that only reveal themselves after exposure to the tender mercies of freight distribution UK style. Some early samples of the *Artemis* suffered fractured crossover PCBs in transit, a problem that I understand was quickly and easily cured.

Having managed to get two working samples from two pairs, one of these surviving units made a nasty noise in the listening test. This turned out to be our fault, for failing to ensure that all the screw terminals were good and tight. But by the time this was diagnosed the panel tests were finished, so I was left to assess this model's sound quality on my own.

The *Artemis* is pitched directly at the steadily growing market for luxury high performance miniatures. At least I assume it's growing, because there are at least two other even more expensive entrants in this particular test group, though a dealer friend says he still finds it very difficult to persuade customers to part with so much cash for something so small.

While I can appreciate the customer's point of view, if performance is the prime criterion, then, price for price, miniatures beat bigger speakers in most areas, provided you're not an inveterate headbanger or party thrower.

£300 does seem a lot for a small box, especially when it's necessary to find another hundred or so for stands. But they're very pretty small boxes indeed, with a range of attractive real wood veneers complementing a metallic grey baffle with pretty post-formed edges. The whole structure is solidly built, though the weight is less than some competitors. The rather thick-framed grille with its overlarge badge does no favours

aesthetically or acoustically.

The enclosure is ported, by two tiny tubes of slightly different lengths fixed into the front baffle. The main driver has a tiny 90mm doped paper cone, a generous magnet and cast frame, and was firmly bolted by machinehead screws into the 19mm MDF baffle.

The tweeter has a 19mm plastic dome, while a large PCB crossover keeps the substantial components well apart (the reason for its fracture), has bi-wire or bi-amp connection terminals, and links everything up with audiophile cabling. The wrap is 14mm MDF, while the inside of the enclosure is (controversially) entirely empty and undamped.

Test Report

The instructions recommend placing within 30cm of a rear wall, and from our traces that should be about right for optimum bass alignment, though do take care to experiment, because this speaker shows a wide variation in midbass levels between our two measuring sites.

By miniature standards, sensitivity is a very respectable 86dB, uncompromised by the mild impedance characteristic and with acceptable bass extension to boot. The treble balance, however, is much more worrying. The original traces taken when just one tweeter was working (I wasn't listening too attentively to the sinewaves) looked better balanced!

The mid treble across nearly a whole octave is some 4 dB louder than the presence region, which is bound to have subjective repercussions. Elsewhere there's a certain amount of local unevenness (some of which might relate to reflections within the undamped enclosure), and some peakiness around 1 kHz.

Sound Quality

Without a panel test result to help out, it was inevitable that the *Artemis* was reviewed in the context of the group as a whole, but especially the physically very similar though rather more expensive JRT and Kammerzelt models.

The conclusion has to be that, to some extent at least, the speaker sounds as you might expect it to. The *Artemis* has many of the beguiling characteristics that make the high performance small speaker such an enjoyable experience.

Lovely stereo focus, fine midrange clarity and refreshing freedom from boxiness are all major attributes, but it does suffer from an exposed treble that becomes a little tiresome (though it might prove susceptible to system set-up fine-tuning). And the bass end doesn't quite manage to keep up with the rest. It rolls along in a rather syrupy way, lacking welly and some dynamic assurance, especially at higher levels.

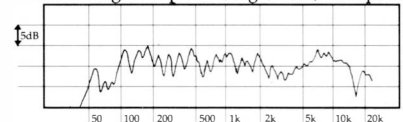
Conclusion

The exceptionally pretty clothes and a significantly keener price than much of the competition is bound to win the *Artemis* plenty of friends. It's certainly good in parts, but lacks a little of the speed and coherence that elevates the very best examples of the breed to the status of true greatness.

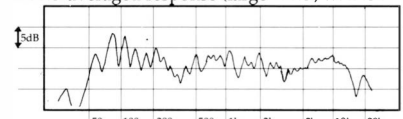
TEST RESULTS

Size (h x w x d)	27 x 17.5 x 22cm
Weight	4kg
Recommended amplifier power	15-60W
Recommended placement	high stands 30cm from wall
In room averaged response limits 50Hz-10kHz	+/-5dB
Large room/space LF rolloff (-6dB ref midband)	50Hz
Large room/wall LF rolloff (-6dB ref midband)	50Hz
Large room output at 20Hz (ref midband)	below -20dB
Estimated midrange sensitivity (ref 2.83V, 1m)	86dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£299

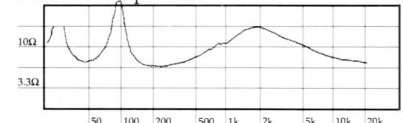
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



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Recommended



It's taken a good few years for the penny to drop, but British loudspeaker manufacturers - presumably both leading and responding to the British loudspeaker buying public - are finally acknowledging that a better loudspeaker is not necessarily a bigger loudspeaker.

As far as modestly priced loudspeakers are concerned, small is usually beautiful. Even small cabinets are quite difficult to control: make them big and you compound these problems.

However, convincing the customer to pay more for a smaller speaker when they can see larger and cheaper models available is difficult, and only really achievable through demonstration. It's therefore much to the credit of UK dealers that this trend has started first in Britain.

All of which is a rather longwinded introduction to a compact new £330 speaker from Arcam, christened the *Delta 2* and actually somewhat smaller than - though just as heavy as - the £200 *Alpha* that got a *Choice* Best Buy rating in issue 82. The *Delta 2* is actually about two-thirds the size of the *Alpha*, but is also slimmer, deeper and consequently a much more fashionable shape.

Construction and engineering, however, are entirely traditional - and by no means the worse for it. The box is attractively finished in real wood veneer, and the speaker looks equally good whether or not the grille is used, partly because the latter fits into a slot machined around the edge of the baffle, which is neater than normal mounting lugs. It is also better designed than most grilles, the chamfered moulded frame offering minimal acoustic impediment.

The wrap is 18mm chipboard, lined with bituminous pads to help damp panel

vibrations, which is certainly a luxury touch these days. The front panel is 19mm MDF, cross-braced and routed to inset the driver frames. A large and long port is fitted to the rear panel behind the tweeter, and internal surfaces are further covered with two grades of acoustic foam.

The generously rated PCB crossover is fitted with bi-wire or bi-amp connections and uses heavy gauge, high quality internal cables hardwired to the drivers.

The tweeter has a small 19mm soft plastic dome with short horn flare, while the main driver is a lovely little unit, with generous magnet, neat cast frame and 120mm polypropylene cone. Both were held unusually tightly in place with fine-pitch machinehead screws and T-nuts.

Test Report

Sensitivity is about average, and the load is nice and easy for any amplifier to drive. The measured in-room balance confirms the installation instructions that the units are better kept clear of wall reinforcement, but, even so, the output at 50Hz is a shade strong, a factor which might cause difficulty in some rooms.

Bass extension is about right for the rest of the package, while elsewhere the midbass is a little lean. The upper midrange, (700Hz to 1kHz), is somewhat forward and exposed, however. There's some loss in the presence band around the crossover, but it's not severe, and the relative treble level looks very well judged, if a touch ragged.

Sound Quality

It may have been helped by its slightly projected midband, or the fact that a rather jaded listening panel had suffered a run of indifferent models and was on the

lookout for something better, but the *Delta 2* was certainly quite a hit in the blind tests.

The sound combines welcome liveliness and openness with good timing and dynamic detail, bringing a real sense of flow to the music, and an impressive sense of scale from speakers so compact. Less welcome is a touch of edginess and high frequency brashness, but the soundstage is more transparent and the sound distinctly less boxy than most.

Working away from the wall always helps minimise midband coloration and promotes spacious and precise stereo imaging, and it's here that the *Delta 2* particularly scores over its stablemate. Where it does fall a little short is in power handling with vinyl sources, the reflex-loading leaving the driver wide open to significant subsonic excursions especially at high levels from warps and the like, which certainly won't improve in-band resolution.

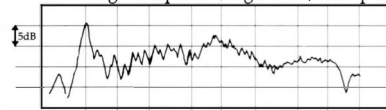
Conclusion

The *Delta 2* is a sensible partner to the *Alpha* speaker. It needs a little more power to achieve the same loudness, but has the same engaging dynamics and liveliness alongside a smoother, sweeter sound with altogether better stereo imaging and lower coloration. All in all, it deserves similarly warm Recommendation.

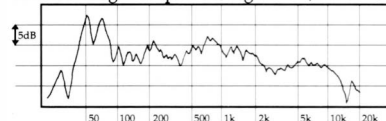
TEST RESULTS

Size (h x w x d)	37.5 x 22.5 x 27cm
Weight	8.5kg
Recommended amplifier power	15-70W
Recommended placement	stands 60cm from wall
In room averaged response limits 50Hz-10kHz	+/-6dB
Large room/space LF rolloff (-6dB ref midband)	40Hz
Large room/wall LF rolloff (-6dB ref midband)	40Hz
Large room output at 20Hz (ref midband)	-15dB
Estimated midrange sensitivity (ref 2.83V, 1m)	87dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£329

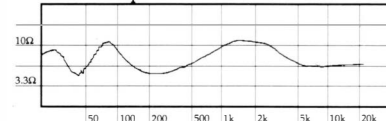
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



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B&W 620

Best Buy

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Halfway through the listening tests, not long after the 620 had already acquitted itself with honour, a message was left on the answering machine to the effect that this quite substantial speaker was to cost £299 instead of the anticipated £399.

Even at the original price it looked a pretty good deal; at £299, if the performance matches up, it could be a steal. One wonders whether the change was stimulated by the current recession, though the official justification is that it was made in order to even up the steps on the price ladder with its four siblings, that start with a £150 600 and extend upwards to a £599 640.

The 620 is a floorstanding speaker, which itself is something of an achievement at the price, whilst also saving customers the necessity of finding another £50 or £100 for a pair of stands. One rather reprehensible economy is that no provision has been made for fitting

spikes into the base of the speaker itself, which is certainly the most cost-effective way of holding things still. I used Michell cones, very successfully as it turned out.

Presentation is nice and modern, if a little cautious with it. The visible baffle is a large moulding in textured grey plastic, chamfered vertical edges being continued in the shape of the moulded frame grille. Gold-plated bi-wire terminals are fitted on the rear, an extravagance in such a model that might have been better directed towards properly engineering the floor coupling.

The box itself is built from 19mm chipboard, stiffened by a large vertical figure-of-eight brace and filled with plenty of carefully placed foam damping. The plastic baffle, which is part hollow but extensively ribbed, adds an extra 20mm of thickness to the front, presumably further contributing to the total stiffness.

What looks on the surface like a three driver array is a straightforward two-way, the lower of the two bass units being just a 'drone cone' auxiliary bass radiator (ABR), which functions in exactly the same way as a reflex port (with the extra luxury of mass control).

Both the generous magnet main driver and the ABR have 150mm plastic cones and cast frames, held in by six rather feeble-looking woodscrews, four biting into only 8mm of plastic but certainly holding very tightly. The 32mm metal dome tweeter is built onto a plastic chassis.

Test Report

Although the 620 has an above average sensitivity rating of 89dB, at least 2dB of this is achieved by sucking extra current from the amplifier by using lowish impedance voice coils. However, let's not be churlish: most amplifiers are only too happy to deliver the extra amperes, and the bass extension is pretty generous too (for the price rather than the size, it must be said).

Kept well clear of walls, the response is remarkably well balanced and surprisingly smooth, all the way up to 1kHz. There's a mild discontinuity as the curve slopes down a few dB from 1kHz to 3kHz, whereupon the treble continues as smooth and flat as before, if perhaps a trifle too well maintained at very high frequencies.

Sound Quality

The 620 did extremely well in the blind tests - a fact which says as much about blind listening tests as it does about B&W 620s. Certainly it would seem to confound

our own acknowledged prejudices against large low cost speakers.

The 620 is indeed an impressive performer in many ways. The sound is smooth, balanced and fundamentally free of any unwelcome nasties. The bottom end is quite impressively weighty, if a bit woolly, but it hangs on in there with some evenness and consistency, and doesn't boom. The slowed midrange is audible as coloration, but the sound is altogether quite coherent, with unusually well-focused stereo for a large box.

The other side of the coin is that it is also fundamentally rather slow and boring. Despite reasonable transparency, there's no real impression of solidity, authority or power. Leading edge detail and emotional content gets lost, while the bass never really manages to assert itself properly.

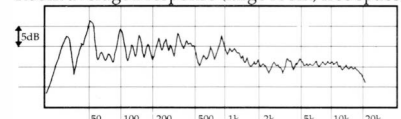
Conclusion

Though my personal preference would certainly still be for something smaller and more nimble, I can't argue with the value for money on offer here, nor with the engineering subtlety that has achieved unusual smoothness and coherence from such a large low cost enclosure. As a fine cost-effective all round performer with wide general appeal, the 620 deserves a Best Buy rating.

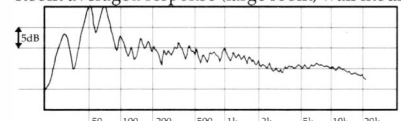
TEST RESULTS

Size (hwxwd)	74x23.5x30cm
Weight	14kg
Recommended amplifier power	15-100W
Recommended placement	on cones well clear of walls
In room averaged response limits 50Hz-10kHz	+/-5dB
Large room/space LF rolloff (-6dB ref midband)	25Hz
Large room/wall LF rolloff (-6dB ref midband)	25Hz
Large room output at 20Hz (ref midband)	-13dB
Estimated midrange sensitivity (ref 2.83V, 1m)	89dB
Impedance characteristic (ease of drive)	current hungry
Typical price per pair (inc VAT)	£300

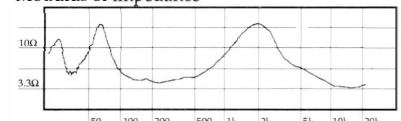
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)

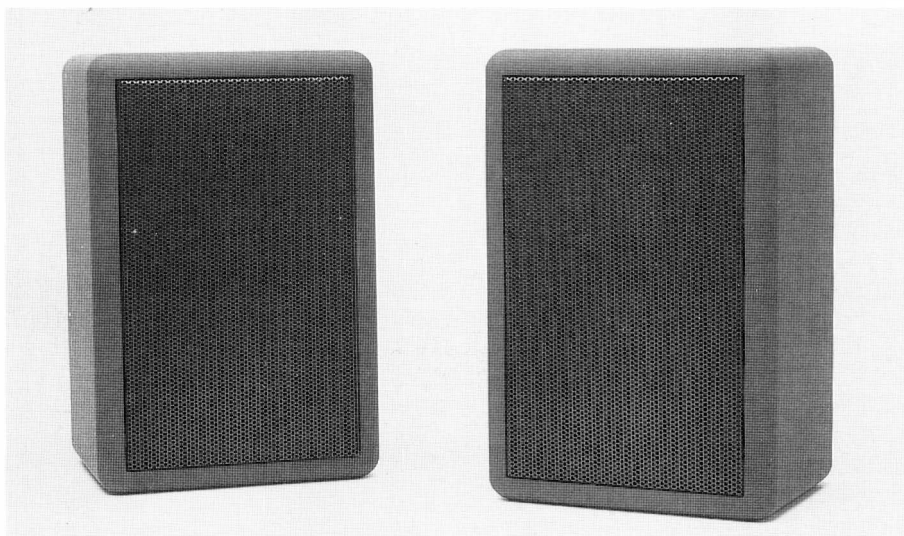


Modulus of impedance



Cambridge SoundWorks Ambiance

CAMBRIDGE SOUNDWORKS UK LTD, HAZLEMERE CROSS ROADS, HIGH WYCOMBE, BUCKS HP15 7LG. TEL: (0494) 715414



The name Henry Kloss is one of a very small handful that resonates down through the history of high fidelity, primarily as the originator of the 'acoustic suspension' (sealed box) bass loading technique that has since passed into widespread general use.

He's been responsible for several 'classic' loudspeakers over the past several decades, under the AR, KLH and Advent banners, though Cambridge SoundWorks is a comparatively new venture. It is based in Massachusetts and uses mail order direct marketing techniques to sell several loudspeaker-based products in the US and the UK.

Besides the miniature stereo speakers featured in this review, there's a four box (subwoofers plus satellites) package called *Ensemble*, and an even more ingenious looking *Model Eleven*. The latter packages a transportable three channel amplifier and a pair of satellite speakers within a briefcase that acts (when unloaded) as the system subwoofer, providing go-anywhere sound from personal stereo type sources (see *Sessions* issue 93).

Showing classic American disregard for spelling protocols and (French) roots, the *Ambiance* tested here is a tiny little loudspeaker, barely half the size of the seven litre 'budget miniatures' so popular in the UK, and making even the *LS3/5A* or *Kan* look large.

At £179 or £199 (according to finish) it's not particularly cheap, nor is it available through your friendly local hi-fi dealer, so you can't actually check our evaluation without sending off a cheque. What you do get is a 30 day period in

which you can return the goods and receive your money back. Which sounds fair enough, for those not too heavily afflicted by personal administration inertia.

In return for said cheque you receive a very pretty looking and very solidly built pair of speakers that look just a little too small to work properly. Ours came in grey Nextel, but paint-it-yourself primer is one alternative, and a very nice looking oak finish carries a £20 premium.

The speakers are beautifully finished, with gold plated terminals and wall bracket mounting lugs built into the rear panel, but it's difficult to see how the engineering content justifies the price. The sealed box is built from 16mm MDF, is well stuffed with wadding and incorporates a complex, high quality PCB crossover.

Lurking beneath an effectively integral perforated metal grille, the main driver combines a massive magnet with pressed steel frame and 90mm paper cone, while the tweeter has a phase-compensated 19mm plastic dome. The various woodscrews were just tolerably tight, with little real purchase.

Test Report

What is particularly clever about the *Ambiance* is the way it has been aligned to give unusually good measured in-room bass extension, even by the standards of boxes twice or thrice its size. Given some help from a nearby wall, the practical balance looks really rather impressive from 50Hz upwards, albeit with some cancellation effects around the crossover.

The price of this impressive extension is one of the lowest sensitivities around. You can drive the *Ambiance* pretty hard, but it's still not going to go that loud.

Sound Quality

When out of sight behind the blind test curtain, these little speakers lose one of the most potent forces in their armoury - the sympathy or 'don't you think I'm trying hard' factor. With their minimalism concealed, the panel was decidedly underwhelmed.

Though there's a refreshing lack of midbass over-richness, cabinet coloration has been moved up to the upper bass instead, and the *Ambiance* never really manages a convincing imitation of a 'real' loudspeaker. Even playing around with positioning and so on, the *Ambiance* fails to impress. Dynamics lack contrast and the upper midrange has a congested hardness that is quite fatiguing.

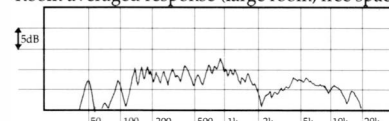
Conclusion

Given its heritage and far from modest price, the CSW *Ambiance* must be regarded as a disappointment, especially in the context of similarly priced 'bijou' models like the *Solid* reviewed in issue 90.

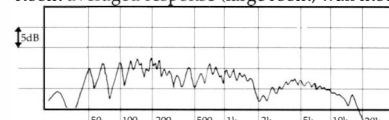
TEST RESULTS

Size (h x w x d)	28 x 18 x 14 cm
Weight	4 kg
Recommended amplifier power	30-70 W
Recommended placement	high stands close to wall
In room averaged response limits 50Hz-10kHz	+/-6dB
Large room/space LF rolloff (-6dB ref midband)	50Hz
Large room/wall LF rolloff (-6dB ref midband)	45Hz
Large room output at 20Hz (ref midband)	-15dB
Estimated midrange sensitivity (ref 2.83V, 1m)	84dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£179

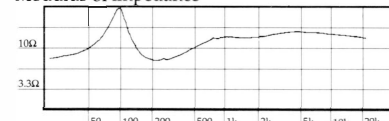
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



Celestion SL6Si

CELESTION INTERNATIONAL LTD, DITTON WORKS, FOXHALL ROAD, IPSWICH, SUFFOLK IP3 8JP. TEL: (0473) 723131



Celestion's original *SL6* broke new ground in the evolution of the modern British hi-fi loudspeaker. Introduced nearly a decade ago, it was crucial to the establishment of the 'upmarket compact' concept, whilst also setting the trend for metal dome tweeters that all manner of manufacturers have since followed. Although the *SL6Si* is the least expensive in Celestion's *SL* range, the £400 '6Si still commands a handsome price premium over such obvious competitors as the Arcam and Epos included in this month's *Choice*. Some of this may be accounted for by the very classy cosmetics, including a very smart badge and cast main driver trim. The grille is not a high spot, however, and should be immediately discarded, the tweeter having its own protective screen/compensator.

The engineering content is impressive too. The classic *SL* tweeter, an unusually large (32mm) diameter aluminium dome, is mounted on its own massive casting, and fixed with damping compound as well as properly tightened screws. Ditto the main driver, which has a hefty magnet and cast frame, along with an unventilated 120mm plastic cone and a special binary surround developed for optimum cone edge termination.

The sealed box enclosure is MDF throughout, the baffle 18mm thick, the 14mm wrap finished in real wood veneer and stiffened internally by a figure-8 brace. The inside is well stuffed with several layers of acoustic foam, and the PCB crossover is complex, high power handling components hardwired with heavy multi-strand cables to the drivers. Perhaps surprisingly, only a single pair of (gold-plated) terminals is provided on the rear.

Test Report

Sensitivity is comfortably below average, though good power handling will still allow decent levels to be achieved with a powerful amplifier, even from vinyl sources, and current demands are quite modest.

One payoff is unusually good bass extension for a 12 litre box. The response graphs show an impressively smooth - if steadily falling - response from 100Hz upwards, with output pretty well maintained through the crossover region. The earlier than usual HF rolloff is a function of the large tweeter diameter, and should be inaudible in any case. The bass traces suggest that a little wall reinforcement will be beneficial, but beware of using too much.

Sound Quality

The *SL6Si* did poorly on the blind listening tests, delivering scores and comments on two separate presentations that in no way reflect the apparent engineering content nor the reputation of this respected range. Strong criticism was directed at the very laid-back balance and rather ponderous, slow bass.

The former is quite clearly, at least partly, a function of the measured balance and to a degree, at least, must be a matter of personal taste. The latter proved extremely reluctant to respond positively, despite trying all manner of stands and positions. I was asked to try alternative amplification, though none was available, and I see no reason why Britain's most popular £1,000+ power amplifier (for many years and by a handsome margin) should shoulder the responsibility.

Eventually I cracked it. The amplifier was cleared of blame by using Slate

Audio's special stands for the test. Costing roughly the same amount as the speaker itself, this substitution was revelatory. Bass congestion is substantially banished; focus, coherence, space and air are all dramatically enhanced. Some cabinet thickening and coloration is still present, but in the main its effects seem greatly reduced.

Conclusion

This is a difficult review to sum up, simply because the only way we could get the *6Si* to sing as they should was by using them on stands that raise the package price to something over £700. However, such was the improvement wrought by using the Slates that the combination actually represents better value for money than cheaper alternatives.

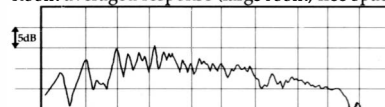
What is clear - and probably explains why the *SLs* have always been controversial, as well as successful - is that the design is very stand-sensitive indeed. An important question we cannot yet answer is whether a less expensive stand exists that can also do a good job.

This new model is still rather laid-back and doesn't deliver the quickest sounds around. But the balance has its own appeal, especially for those who use CD as a prime source. The design still shows the unique qualities of transparency and focus that justify its status as a classic, even though we remain reluctant to confer formal recommendation.

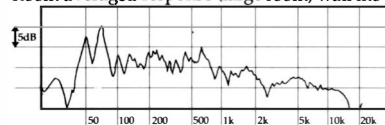
TEST RESULTS

Size (h x w x d)	37.5 x 20 x 25 cm
Weight	8 kg
Recommended amplifier power	20-120 W
Recommended placement	heavy stands 30-60 cm from wall
In room averaged response limits 50Hz-10kHz	+/- 5 dB
Large room/space LF rolloff (-6dB ref midband)	30 Hz
Large room/wall LF rolloff (-6dB ref midband)	30 Hz
Large room output at 20Hz (ref midband)	-10 dB
Estimated midrange sensitivity (ref 2.83V, 1m)	85 dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£399

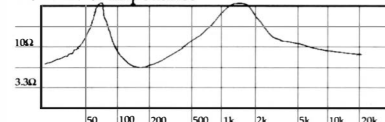
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



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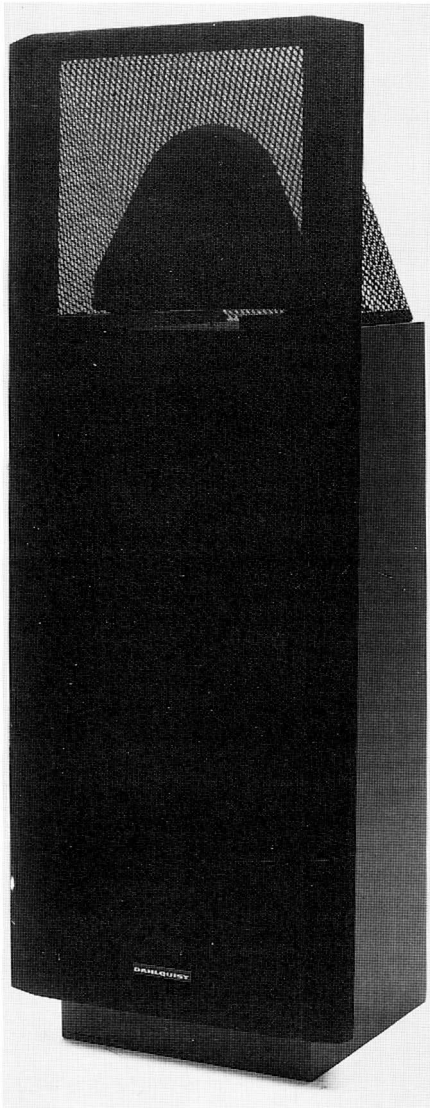
*Voted Best Amplifier 89-90
What Hi-Fi magazine

Cambridge Systems Technology Limited
26 Roman Way Industrial Estate
Godmanchester, Huntingdon
Cambs PE18 8LN, Tel. 0480 52521

Dahlquist DQ8

THE SOUND IMAGE STAGE, 458 ALEXANDRA AVENUE, RAYNERS LANE, HARROW, MIDDLESEX. TEL: (081) 866 2865

Recommended



Dahlquist became famous - perhaps that should be notorious - in Britain a little over a decade ago, with a highly unusual and controversial loudspeaker that looked for all the world like a Quad *Electrostatic* (of the old type), yet which used a complex array of conventional drive units in a peculiar open/staggered baffle arrangement.

Though the original Dahlquist principals moved on some time ago, the company has remained very active in the US, and three models in the open-baffle tradition are distributed in the UK. The *DQ8* under scrutiny here is a quite bulky floorstanding model of altogether more conventional appearance than its ancestor, if a bit weird for all that.

The UK price is £850 the pair, which places it amongst the most expensive in this particular test group, but for that you get something pretty large and substantial. It's not the prettiest of speakers, though

the lack of right angles and slab sides does at least help it stand out from the crowd. At the same time, the design is far from space efficient, looking bigger than many designs with similar bass performance.

The basis is a modest floorstanding rectangular box of about 30 litres, wider than it is deep. A shaped grille frame makes it wider still, and is extended up about 30cm above the box proper. The whole thing is floor coupled by cones.

Set on top of the box but behind the grille is the tweeter, with its own foam covered sub-baffle set back and angled to fire slightly above the heads of listeners. According to Dahlquist it's all to do with minimising baffle edge secondary radiation, with a bit of time compensation thrown in for good measure, both of which are certainly worthwhile design goals.

Presentation is drab, a combination of black cloth and paintwork, which is a pity since the *DQ8* is intended to be used away from walls and angled so that its direction axes cross in front of the listening area. However, the engineering content (or that which was accessible to inspection) seems pretty solid.

The enclosure seems to be a combination of 19mm and 12mm MDF, damped by bituminous pads and light foam. The remnants of a cut-through cross-brace remains mysterious. It is reflex loaded by a generous front port and driven by a 160mm main unit, with what looks like a plastic cone. The bi-wire/-amp crossover has external fuses for each driver (for enthusiasts to bypass), and uses decent rating commercial grade components. The tweeter is a 25mm soft fabric dome.

Test Report

This Dally delivers above average sensitivity alongside a very easy amplifier load, though the price is extracted in bass extension which is modest for such a large loudspeaker. The overall response trend (taken only in free space, since this model is no wall-mount) is remarkably close to the ideal. There's some local unevenness, but little that's likely to cause audible coloration.

Sound Quality

There was quite a variety of reactions from the assembled listeners, some at least coming out strongly in favour of the Dahlquist sound. What is certainly clear is that the out-of-box tweeter is very successful at creating an unusually out-of-the-box and transparent sound, with fine stereo focus and space. The way voices can send shivers up the spine is well up

with the best miniatures, and far better than most bookshelf speakers can manage.

Treble detailing is impressive too, but there was a little too much - and too much untidiness - for some. Much more of a problem is the bass, which somehow doesn't quite match - or match up to - the top end transparency and coherence. There's plenty of power and energy, reasonable evenness and information, but it's all a bit resonant and juicy, without the nimbleness needed to keep up with the treble. Spoken voices from FM radio take on a distinct chestiness.

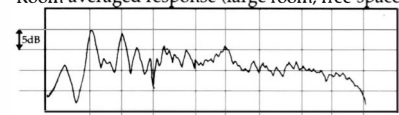
Conclusion

My lasting impression of the original Dahlquist of more than decade ago was of a highly impressive midrange and treble let down by rather indifferent bass performance. History appears to repeat itself here, though that doesn't leave the *DQ8* wanting when weighed in the balance. This two way variation may not be perfect but it's still a very cost effective way of obtaining the unique qualities of the Dahlquist sound, in a practical (if ugly) package that is certainly sufficient value for Recommendation.

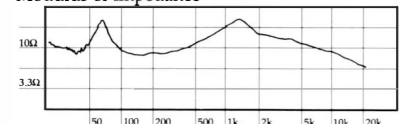
TEST RESULTS

Size (h x w x d)	100.5 x 36 x 28 cm
Weight	16 kg
Recommended amplifier power	20-100 W
Recommended placement	over-angled in free space
In room averaged response limits 50Hz-10kHz	+/-6dB
Large room/space LF rolloff (-6dB ref midband)	30Hz
Large room output at 20Hz (ref midband)	-14dB
Estimated midrange sensitivity (ref 2.83V, 1m)	88dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£850

Room averaged response (large room, free space)



Modulus of impedance



Epos ES11

Best Buy

EPOS ACOUSTICS, UNIT A1, HAZLETON INDUSTRIAL PARK,
HORNDEN, HAMPSHIRE, PO8 9JU. TEL: (0705) 597722



For reasons that lurk in the murky past of loudspeaker review controversy, *Hi-fi Choice* never got around to evaluating the Epos loudspeaker, the £475 *ES14* - which hasn't stopped Robin Marshall's brainchild from carving out a niche as one of the most successful medium size speakers around.

With Epos now a premium specialist brand within the Mordaunt-Short operation, giving Robin Marshall time to concentrate on design work, the long awaited smaller Epos is now a reality.

The £300 *ES11* is roughly two-thirds the volume - and the price - of its bigger brother, though it has just as many drive units. Apart from exceptionally fine finish and very solid build, on the surface it looks like a straightforward enough medium sized two-way 'bookshelf' model. However, there's a little more to the '11 than meets the eye.

Following the example set by the Mordaunt-Short *3-series*, both front and back panels are injection-moulded plastics. Here the process has been taken one stage further, the frame of the main driver itself being an integral part of the moulding. Should you blow one up, it would be necessary to change the whole baffle, but M-S doesn't reckon this would cost more than a normal driver replacement.

Nicely decorated in real wood veneer, the carcass wrap is 25mm MDF, further braced with an O-section internally, which helps account for the substantial weight. The whole thing is held together by four back-to-front bolts, clamping the ported back panel and baffle tightly against the wrap.

Perhaps controversially, but probably sensibly, there's no grille as such. The

25mm metal dome tweeter has its own mesh protection, and a purely protective overall cover is supplied, but must be removed before playing music.

Although two pairs of (very poorly distinguished) terminals are fitted, this was apparently more at the behest of the marketing department than the designers, the crossover being minimal - indeed nonexistent as far as the main driver is concerned. The latter has a 110mm plastic cone and phase plug pole-piece extension.

Test Report

Sensitivity is a little below average, partly because the impedance represents a very easy amplifier load. Bass extension is also surprisingly limited compared to other models of a similar size, having more in common with miniatures than compacts in this respect.

The response traces are significantly more even than most through the mid and treble, with fine crossover transition, showing just mild perturbations from 3-6 kHz. The top end of the main driver's working range shows unusually good control, with just a small step transition down to the tweeter, which is very creditable considering there's no electrical compensation whatsoever.

The overall response evenness clearly benefits from a little wall assistance, but beware of adding too much, and of rooms that unduly exaggerate the output around 50Hz.

Sound Quality

The *ES11* did very well in the listening tests, with comfortably above average marks from all panelists. The bass is decidedly nimble, if a little short of genuine scale and weight, while the midrange is

delightfully open and detailed, focusing well with commendable stereo soundstage precision and depth. Coloration and boxiness are both low, though there's a slight upper range 'glare' that threatens to be exaggerated by poor system set-up.

Quite independently, two panelists even went so far as to mention a lump coming to the throat during Mary Black's plaintive *Columbus* (on CD, to boot), such was the level of involvement and emotional communication.

Conclusion

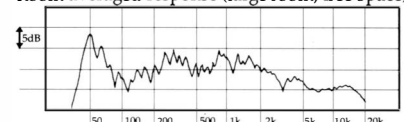
Though a trifle short of scale and welly compared to some of the competition, this loudspeaker's greatest (indeed almost unique) strength lies not in its performance in any one area, but in the way it seems equally capable of satisfying those looking primarily for speed and dynamics whilst not in any way offending those whose main preoccupation lies in the sort of stereo soundfield only achievable with low coloration, out-of-box transparency and fine focus - and vice versa for that matter.

To give a more concrete example, the *ES11* delivers much of the drama and involvement of a Linn *Index*, alongside the sort of delicacy and transparency associated with a Celestion *SL6Si*. Which is quite an achievement in a market that frequently seems all too strongly polarised between these two extremes, and an excellent justification for a Best Buy rating.

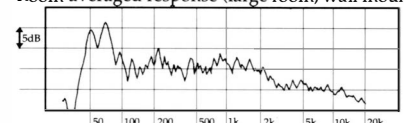
TEST RESULTS

Size (hxwxwd)	37.5x 20x25cm
Weight	9kg
Recommended amplifier power	20-70W
Recommended placement	stands 30-60cm from wall
In room averaged response limits 50Hz-10kHz	+/-7dB
Large room/space LF rolloff (-6dB ref midband)	45Hz
Large room/wall LF rolloff (-6dB ref midband)	45Hz
Large room output at 20Hz (ref midband)	below -20dB
Estimated midrange sensitivity (ref 2.83V, 1m)	86dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£300

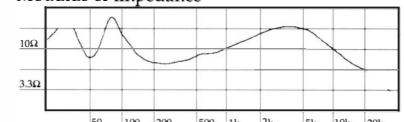
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)

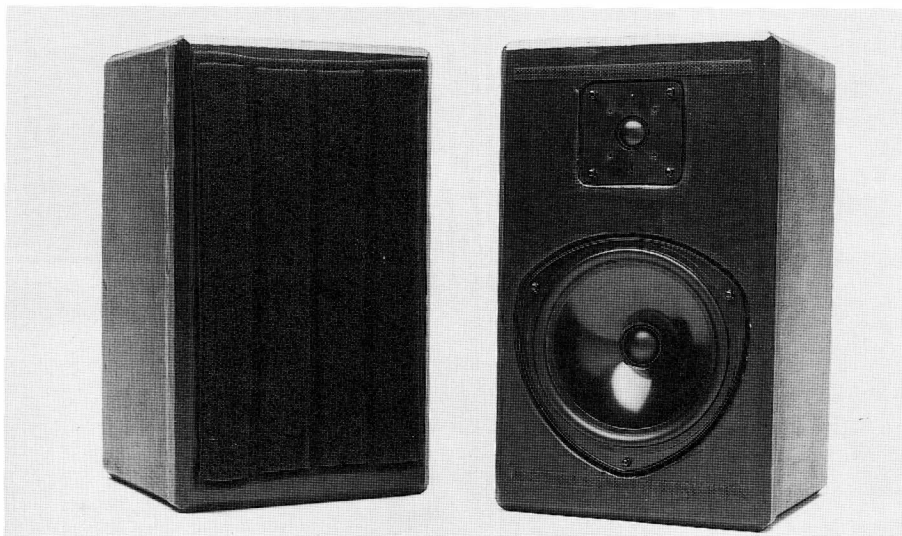


Modulus of impedance



Faraday Siren

FARADAY SOUND, 248 HALL ROAD, NORWICH NR1 2PW.
TEL: (0603) 762967



You're unlikely to find a *Siren* down at your local hi-fi shop, unless you happen to live in East Anglia. Faraday is relying on customers reading about its particular mousetrap and beating a path to the door, hopefully departing satisfied, leaving pound notes behind whilst staggering under the weight of these loudspeakers.

This may not be the best approach to marketing and distribution, but there's probably no practical alternative. Attempting to pack and distribute speakers that weigh half a hundredweight each, let alone persuade dealers to stock and demonstrate them would be well nigh impossible. The fact that the customer saves the shipping costs and retail margin is obviously a bonus.

The *Siren* is built from concrete, and pretty roughcast concrete at that, which a coat or two of black paint and velcro/foam grille do little to disguise. Aesthetically it's one of the ugliest speakers I've seen, but aesthetics often take a low priority for the hair-shirt enthusiast seeking the most performance for his money. And if a speaker's performance is in any way related to its mass - which in my experience is quite often the case - the *Siren* clearly could prove a leading contender in the value for money stakes.

The carcass has a 30mm baffle and 20mm sides, damping foam and felt lining the walls, while the large rear port is well stuffed with wadding. Faraday's contribution to the *Siren* stops with the cabinet. The loudspeaker bit is simply a Kefkit (Kef's Construction Series of raw drivers and crossovers, aimed at DIY markets around the world).

The contents here are otherwise known as KEF's CS3. It was the driver/crossover

complement that was used at the business end of the *R103*, a deservedly popular model in its day, but one which was discontinued in 1983. This driver technology itself has been around for more than a decade, and unfortunately it shows.

One thing's certain, Faraday isn't trying to take anyone for a ride. Add up the retail prices of the CS3 constituents and it comes to £167 for the pair, so the margin left for all that mucky cabinet building is so remarkably slim that someone must be doing it for fun rather than profit. Internal soldering and suchlike was strictly DIY standard.

Test Report

Our sensitivity rating comes out at 87dB, though it's a rather approximate figure since output exceeds that by several dB through the mid and upper bass, and falls rather short through the presence band. Still, the *Siren* will make respectably loud noises with even modest amplification.

Clearly best kept at least 30cm and probably more from room boundaries, the response remains dominated by excess output from 100 to 400Hz, while the 2-4 kHz suckout is followed by a strong recovery at 4-8kHz. The bass extension is distinctly unexceptional for a 21 litre enclosure.

Sound Quality

Going some way towards vindicating the use of concrete, the *Siren* certainly doesn't suffer from the usual box colorations that affect more conventional loudspeakers. Unfortunately the basic response was sufficiently aberrant to completely upset the listening panel (not to mention yours truly attempting to match volume levels).

The *Siren* is definitely coloured, but it's

not cabinet coloration in the accepted sense of the word. Like it or not qualitatively, the bass packs a real wallop, and is at least well paced, if not exactly 'fast'. The treble is unusually well detailed too, if a bit fierce and abrasive at high levels.

Listening 'through' the balance difficulties over an extended period left me in no doubt that the sheer inertia of the cabinet does confer some real benefits. Though focus and depth could be better, the stereo image is impressively stable and out-of-the-box, and the sound seems refreshingly clear of the bass untidiness that afflicts most users of wood derivatives.

Conclusion

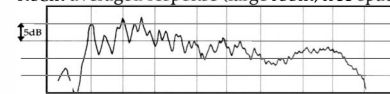
The *Siren* is too unbalanced for formal recommendation in its present form, though it does have some real strengths that tempt one to disregard the problems of ageing driver technology and enjoy the good things a high mass concrete cabinet can bring.

It also serves as a reminder that there is still a niche left for those wishing to roll their own speakers, so to speak, since the concrete enclosure has always been peculiarly well suited to the DIY approach. It would be interesting to find out how a concrete box would sound with something really up to date like an Epos *ES11* baffle and crossover fitted to the front.

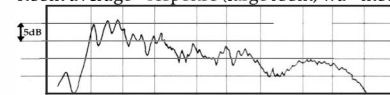
TEST RESULTS

Size (h x w x d)	46 x 27 x 27 cm
Weight	25 kg
Recommended amplifier power	15-100 W
Recommended placement	stands in free space
In room averaged response limits 50Hz-10kHz	+/- 6dB
Large room/space LF rolloff (-6dB ref midband)	48 Hz
Large room/wall LF rolloff (-6dB ref midband)	45 Hz
Large room output at 20Hz (ref midband)	c. 20 dB
Estimated midrange sensitivity (ref 2.83V, 1m)	87 dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£330 (ex works)

Room averaged response (large room, free space)

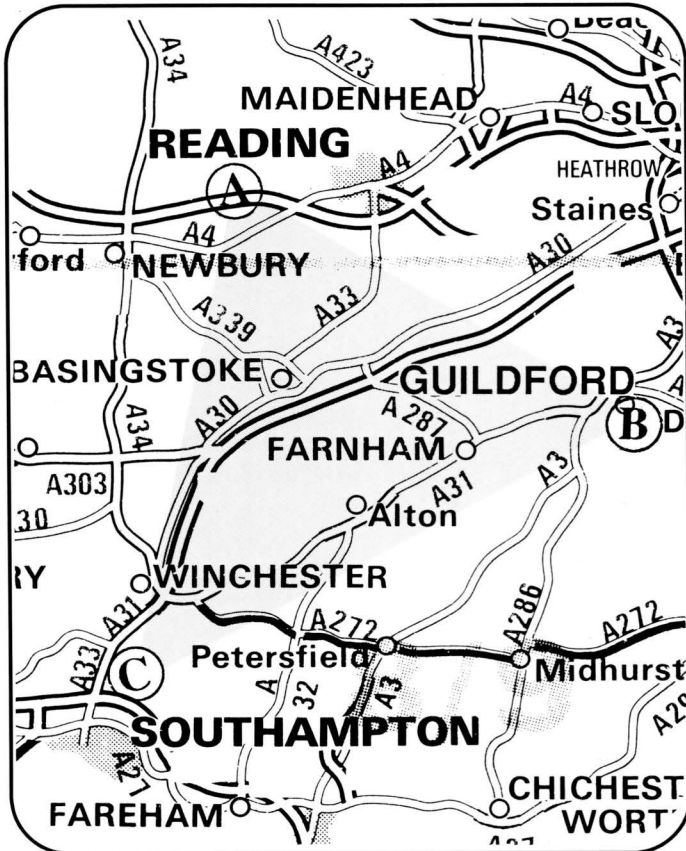


Room averaged response (large room, wall mount)



Modulus of impedance





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Goodmans M500

GOODMANS LOUDSPEAKERS LTD, 1&3 RIDGWAY, HAVANT, HANTS
PO9 1JS. TEL: (0705) 492777



Third of the current Goodmans *M-series* budget loudspeakers to come under *Choice* scrutiny, the *M500* is also the largest of the three. As night follows day it is naturally also the most expensive, though the size of box on offer for £130 gives no cause to think it will be the best sounding.

The budget big box formula looks increasingly dated in this age of high performance miniatures. Other things being equal, a bigger unit will provide more sound from the same amplifier, usually with some extra bass extension besides. But in the real world, the larger the box, the harder it is to control, and the less effective it is at controlling the drivers. What you certainly do get is a quite large loudspeaker for comparatively little money, a recipe that tends to promote perceived rather than sonic value.

The package is clad in a rather anonymous black vinyl, though the front panel is nicely decorated and finished in a grooved grey rubberised laminate that lies flush with the driver frames. Which is just as well, because the thick-framed grille won't do the performance any favours whatsoever, and should be discarded immediately.

Beauty in this case turns out to extend not far below the skin. On one sample at least two of the main driver screws had already stripped any grip afforded by the rather coarse 13mm chipboard front panel, and none of the screws were properly tightened - or indeed properly tightenable. The wrap is a couple of millimetres thicker, but there's no bracing of any kind and internal damping is minimal.

Despite the small rear port loading, the main driver magnet is small. An undamped 145mm paper cone and wide surround is mounted in a pressed steel

basket. The tweeter is a 19mm plastic dome, and the crossover simple, with small components linked with bell wire but soldered throughout.

The first samples delivered turned out to have one tweeter not working, rather to the surprise of the listening panel. Replacements were quickly received.

Test Report

The *M500* shows quite close similarity to its smaller '300 sibling, with a similarly generous 89dB sensitivity rating alongside a benign load that won't embarrass even a mini system amplifier. What the '500 does offer over its cheaper brother is a welcome increase in bass output, at all frequencies below 150Hz.

In fact the response looks basically quite well balanced, especially through the crossover and treble region. However, there is a bias towards the mid-bass and lower-mid that cannot be completely eradicated by careful positioning.

Sound Quality

The panel reacted with supreme indifference to the *M500*. Though such comparison is not strictly valid, collation with earlier tests does suggest it falls well short of the '300, and a little below the '100 too.

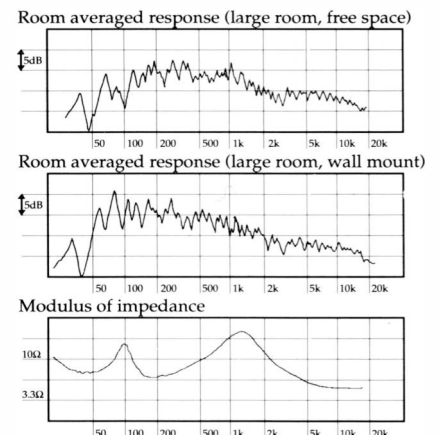
Most of the complaint was directed against a bass which is clearly on the heavy side, yet lacks poise, speed, timing and subjective extension. The speaker sounds quite 'big', but not adequately controlled. Vocal and upper range detail seems distant and veiled, the adjective 'dark' cropping up more than once, as did the comment that the speaker somehow lacks solidity and substance.

Conclusion

It's a bit like Goldilocks and the three bears: daddy bear is the one to avoid. Increasing the size may improve bass reach, but in this instance the charm is also replaced by a crudity that may (or may not) be related either to the size of the box or the rather indifferent standard of build.

TEST RESULTS

Size (hxwx d)	47x24.5x21.5cm
Weight	6.5kg
Recommended amplifier power	10-70W
Recommended placement	experiment
In room averaged response limits 50Hz-10kHz	+/-6dB
Large room/space LF rolloff (-6dB ref midband)	50Hz
Large room/wall LF rolloff (-6dB ref midband)	48Hz
Large room output at 20Hz (ref midband)	-15dB
Estimated midrange sensitivity (ref 2.83V, 1m)	89dB
Impedance characteristic (ease of drive)	good
Typical price per pair (inc VAT)	£130



Heco Interior Plus 404

HECO UK, FOURBURY HOUSE, 36 VICTORIA ROAD, MORTIMER, NR. READING RG7 3SE. TEL: (0734) 333636



West German manufacturer Heco has added a third complete range of speakers to its line-up. The *Interior Plus* models fit in halfway between the *Interiors* and *Superiors*, starting at £250 for the smallest two-way. The subject of this review, however, is on the third of a four rung ladder, at £400.

It's an odd size and shape really, a bit too big to be called a bookshelf model, yet too stumpy in proportions for floorstanding. Heco itself describes it as a 'short column', suggesting it be used on 'sideboards, highboards or qualified pedestals'.

Shape notwithstanding, presentation and finish are first class, helped by real wood veneer that is nicely stained matt black in such a way as to preserve the pattern of the veneer. Three alternative finishes are also available, as is a mirror top plate (presumably for those wishing to add a houseplant or two).

The baffle is slightly recessed as part of the wrap, with nice post-forming on the vertical edges. Consequently the grille is an integral part of the aesthetic package, because the speaker looks half finished without it; though the thick wooden frame looks unlikely to do any acoustic favours.

It's a two-way system operationally, but uses three drivers to achieve that end, twin 120mm polypropylene cone bass/mid units bracketing the solitary 19mm metal dome tweeter. Such an arrangement (also seen in the *Cyrus 782* and *KEF R104.2*) has certain acoustic implications for the crossover region.

A normal two-way has two drivers around a dozen centimetres apart each behaving as a 'point source'. At the crossover point each is attempting to

reproduce the same signal, giving rise to some waveform interference between the two.

In this Heco configuration the interference lobing is improved because the two mid drivers do to some extent pretend they're a single unit at the same position as the tweeter itself. However, because there are two drivers, they behave more like a line than a point-source, generating cylindrical rather than spherical waves. Getting the two types to marry up successfully in the listening room is far from easy.

The bass driver woodscrews were nice and tight, not so those holding the tweeter. Each main driver operates into its own identically-sized sealed compartment, the divide helping stiffen the 15mm high density board enclosure, which is well stuffed with wadding.

Test Report

With sensitivity a shade or two above average, and bass unusually well extended for the box size, a continental type low impedance is pretty well guaranteed. Make sure the partnering amplifier is happy delivering plenty of power into 4ohms.

The overall responses show the 404 should be kept well clear of walls, and even then the balance is inclined to bass richness. Or to put it another way, there's a slight loss of output across a broad valley covering the upper midrange and presence region, from 800Hz to 4kHz. Looking a little like a loudness contour, this is a direct consequence of the distribution pattern of the twin driver arrangement. There's also a certain amount of local unevenness, though no worse than average.

Sound Quality

The listening panel was reasonably happy with the 404, albeit without showing any particular enthusiasm. However, our notes suggest it was played rather too loud for its sensitivity rating, presumably in an attempt to counter the subjective consequences of the rather depressed upper mid, so we're cautious of placing too great a credence in these findings.

The sound is big and rather heavy, with a little too much treble tizz. The sense of scale and lack of boxiness is rather impressive, and the speaker delivers decent power and energy, though the bass is a little slow and the midbass sloppy and uneven, with some dynamic clogging. It can be driven to quite high levels, the slight over exposure of the treble being the subjective limiting factor.

It's not fast, but it's not slow either. Timing gets about halfway there. Cabinet resonances seem well controlled, though the sound could be more solid, and vinyl disc surface noise is a bit obtrusive.

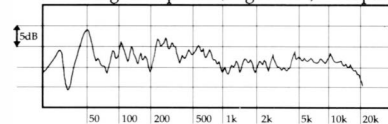
Conclusion

Suffering a little from the loudness or boom'n'tizz syndromes, the 404 is otherwise well mannered enough, delivering a good impression of scale for the box size. But it's an odd shape, must be kept clear of walls and therefore requires a good quality stand, leaving it rather uncompetitive when compared to the latest floorstanders.

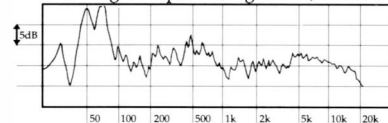
TEST RESULTS

Size (hxwxwd)	58x26x31cm
Weight	12kg
Recommended amplifier power	20-100W
Recommended placement	low stands well clear of walls
In room averaged response limits 50Hz-10kHz	+/-7dB
Large room/space LF rolloff (-6dB ref midband)	25Hz
Large room/wall LF rolloff (-6dB ref midband)	23Hz
Large room output at 20Hz (ref midband)	-9dB
Estimated midrange sensitivity (ref 2.83V, 1m)	88dB
Impedance characteristic (ease of drive)	current hungry
Typical price per pair (inc VAT)	£400

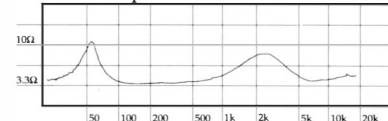
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



Heybrook Point 5 Series 2

Best Buy

HEYBROOK HI-FI LTD, ESTOVER CLOSE, ESTOVER INDUSTRIAL ESTATE, PLYMOUTH, DEVON PL6 7PL. TEL: (0752) 780311



No longer the cheapest model in Heybrook's extensive range of compact 'bookshelf' speakers, that honour going to the brand new £149 *Solo* reviewed in issue 90, the popular *Point 5* now costs £179 in its latest *Series 2* incarnation.

Our review of the original praised the lively character whilst criticising the rather uncomfortable treble, both of which would seem to be characteristics of the brand, so it won't be too surprising if it all comes down to weighing the pros against the cons yet again.

One distinguishing feature of this model is the rather unusual construction of the box. Instead of wrapping the front and back panels with a V-grooved plank of imitation wood, *Point 5 Series 2* has a 15mm wrap forming front, back and sides, while nicely chamfered substantial 25mm MDF top and bottom panels are part-inserted to add stiffening. The inside is carefully filled with a cocktail of damping materials, and a very simple crossover is hardwired using thin 'solid-core' type cabling to two sets of terminals, for bi-wire or bi-amp drive.

The cabinet is finished in a textured black, and looks smart enough with or without the grilles in place. These look harmless enough, but removal improved the sound quality noticeably. The main driver is a small (110mm) paper cone affair, while the new-for-*Series 2* tweeter is a 20mm fabric dome device. Both drivers were exceptionally well secured.

Test Report

Bass extension is very good for the size of the box, and the load is very easy for

amplifiers to drive. The concomitant trade-off is some sacrifice in sensitivity, which is a couple of dB below average.

Although there's a certain amount of local unevenness, the overall frequency balance is very good indeed, especially when sited close to the wall as the manufacturer intends. The crossover transition is very well handled, though the treble is a bit uneven and the upper treble is a shade exposed.

Sound Quality

An overall average ranking is no disgrace for a speaker which is in the lower quartile of the group with regard to price, though one couldn't say the *Point 5 Series 2* had exactly covered itself in glory in the unseen listening tests.

My own notes made during the listening tests praise the exuberance, timing and good wall balance, but also complain of mid and treble scrappiness and untidiness, a combination of attributes that mirror my recollection of its predecessor, and which were repeated under normal listening conditions.

However, although there's scant reference in the accompanying instructions, I recall Heybrook's Peter Comeau once moaning at me for not trying solid-core cables. I'm no great fan of the stuff, which in my experience usually tends to sap some power, energy and speed from a system, but felt obliged to give it a go.

What a transformation! Suddenly the whole sound became much more coherent and sweet, especially from vinyl discs. The slightly 'fat' bass and aggressive 'edge'

both came smartly into line, and the timing became much tighter. Not faster, mind, since this is not a particularly 'fast' speaker, especially via solid-core, but it's much better poised, with a romantically delicate bounce and swing rather than slam and energy.

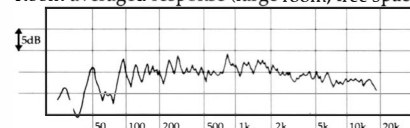
Conclusion

Right up until the solid-core experience, the *Point 5 Series 2* was pretty borderline for recommendation. With the cables substituted, the designer's intentions - and his success at achieving them - become abundantly clear. The result is perhaps a slightly rose-coloured view of the world, but it's highly enjoyable, with unusually delicate transparency for a wall-mount. Heybrook should certainly put much more stress on this cable factor in its leaflets, under which conditions the new *Point 5* clearly deserves enthusiastic endorsement.

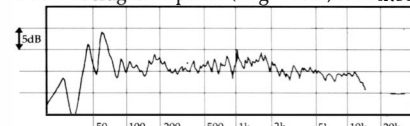
TEST RESULTS

Size (h x w x d)	37.5 x 23 x 24.5 cm
Weight	6 kg
Recommended amplifier power	15-75 W
Recommended placement	HBS1 stands close to wall
In room averaged response limits 50Hz-10kHz	+/-6dB
Large room/space LF rolloff (-6dB ref midband)	28Hz
Large room/wall LF rolloff (-6dB ref midband)	28Hz
Large room output at 20Hz (ref midband)	-11dB
Estimated midrange sensitivity (ref 2.83V, 1m)	85dB
Impedance characteristic (ease of drive)	good
Typical price per pair (inc VAT)	£179

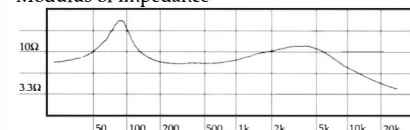
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



Jamo Concert VII

JAMO UK LTD, JAMO HOUSE, HEYFORD LANE, STOWE HILL, WEEDON, NORTHANTS NN7 4SF. TEL: (0327) 349449



Danish brand Jamo picked up something of a headbanging reputation, thanks to the marketing policies of its previous importer. Now that the company is operating through its own subsidiary, that situation is starting to change.

Jamo has taken niche marketing to its logical conclusion. Few - if any - brands operate across such a wide range of products, from speakers disguised as light fittings via the headbangers to some very sophisticated looking models indeed, of which the £649 *Concert VII* is one of the best examples.

Helping make up for any shortfall in brand image, perceived value is certainly good. It's a large (80litre) and exceedingly handsome floorstanding enclosure, weighing a substantial 28kg and sitting on rubber feet (with optional spike inserts).

Our samples were finished in a lovely red mahogany veneer, with contrasting dark baffle. The front panel has nicely

post-formed edges, and an exceedingly neat grille, based on a thin metal plate frame that is held on by hidden magnets set into the baffle.

For want of the right tool, we couldn't get inside, but have plenty of information about this unusual and elaborate design. All that's visible under the grille is a modest size midrange driver and 25mm metal dome tweeter, plus a very generous, curiously shaped moulded port. Inside lurk not one but two bass drivers, each operating in its own quite differently tuned reflex chamber, the outputs combining at the port.

The various internal partitions will provide stiffening, and Jamo is particularly proud of its special 'resonance free' baffle material, a composite of sand and lossy binder. The whole back panel is removable, presumably to facilitate manufacture and servicing. Gold plated bi-wire or bi-amp terminals are fitted, separating the tweeter from the rest.

Test Report

Even in free space the balance is a little bass rich, though not particularly extended considering that the overall sensitivity is a shade below average. This is surprising in view of the high current demands made by the twin woofers system.

The 50-200Hz richness apart, the midband is pretty smooth up to around 1.5kHz, whereupon the tweeter starts to come in. There's some loss of energy across the presence octave, followed by some mid treble recovery. All is reasonably smooth and even, though the subjective implications are likely to be a rich, dulled sound.

Sound Quality

Some listeners were quite taken with the full, rich balance and good articulation of this speaker. Another, with whom I find myself in close agreement, was less complimentary, summing up the sound of the *Concert VII* as follows: "nice vocal, indifferent timing, leaden and ponderous bass; good in parts; about average overall".

This became more obvious when conducting hands on tests, and exploring the performance at higher levels. The bass shakes the floor alright, and does convey a reasonable impression of weight and scale, but it has all the slam of a jelly mould; all the timing of a clockwork orange. Waffle and detachment rule, conveying no serious foundation, substance or authority.

The top end has some sparkle - maybe a little too much for some tastes - while the

midrange is (not unpleasantly) laid back and slightly darkened by the presence losses. But there's none of the dynamic life that comes from true coherence, even when listening from far enough away to give the wavefront from this large enclosure a chance to integrate properly. The overall balance certainly works better with CD than vinyl, but the rubbery bass still gets in the way, while spoken word has a chesty quality too.

Conclusion

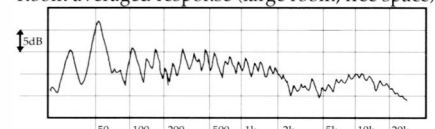
Even though it is one of the prettiest examples of the type, I have to admit I find this loudspeaker a considerable disappointment. That's only partly because I personally dislike the sound it makes; there were those on the panel who really liked the relaxed, rich and laid back balance, and their subjective opinions are as valid as my own.

But the basic performance envelope (sensitivity/extension/impedance) is also disappointing for such a large and complex box, as may be seen by comparing the parameters with the competition. Any benefits from the elaborate construction and technology seem to have been squandered - or maybe it's all the fault of the rubber feet.

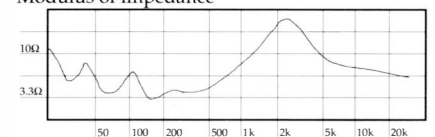
TEST RESULTS

Size (h x w x d)	96x28x31.5cm
Weight	28kg
Recommended amplifier power	15-150W
Recommended placement	well clear of walls
In room averaged response limits 50Hz-10kHz	+/-9dB
Large room/space LF rolloff (-6dB ref midband)	25Hz
Large room output at 20Hz (ref midband)	-9dB
Estimated midrange sensitivity (ref 2.83V, 1m)	87dB
Impedance characteristic (ease of drive)	needs good current delivery
Typical price per pair (inc VAT)	£649

Room averaged response (large room, free space)



Modulus of impedance



JBL L20 T3

HARMAN (AUDIO) UK LTD, MILL STREET, SLOUGH, BERKS SL2 5DD.
TEL: (0753) 76911



One reason why this major US manufacturer has such an enormous range - some 20 models just for the hi-fi market - is simply that it's been around for a very long time. New models may come along from time to time, but don't necessarily replace older designs that are well established favourites.

Such is the *L20*, which has been around in some form or another for as long as I can remember. Or to be more honest about it, for as long as I can't remember, since it's not all that memorable a loudspeaker. Still, it's a pretty enough looking package, and must have done well to have gone on as long as *Mark 3* status implies.

In *T3* form, it costs £249, which is maybe a shade on the high side for a stereotype 'bookshelf' size box and the current state of the US dollar. However, you do get a rather nice line in real wood veneer, and the JBL badge has always been worth a few bob on the pricetag.

One of the brand's hallmarks is the pleated titanium dome tweeter, which again puts in an appearance here, the dome surface sensibly protected by an open mesh screen. Another luxury touch is the substantial cast-frame and generous symmetrical field magnet used by the 115mm plastic cone main driver, itself properly screwed home.

One mild oddity is that the tweeter is offset slightly from the centre line of the front panel. It's a well enough regarded technique for reducing (or at any rate spreading) the effect of baffle edge diffraction, which is one of the real banes of the loudspeaker designer's life. But if truly accurate stereo is to be achieved, the two samples of a pair must be constructed as a mirror image of each other, which is not the case here.

Reinforced Lock Mitre is the expression the company uses to describe the construction technique of what is certainly a very strong little box, built from 20mm thick chipboard panels and lightly lined by absorbent felt. A generous port is fitted to the rear panel, as is the straightforward looking PCB crossover, described by JBL as High Spatial Identification, whatever that may mean.

Test Report

Although sensitivity is commendably close to average, and achieved without any trade-off in terms of a current hungry impedance, the low frequency performance of the *L20* is much more like the typical miniature loudspeaker than a medium sized bookshelf model. You get nothing below 50Hz, and arguably a little too much at 50Hz, though that may depend on the characteristics of the listening room (the port is tuned to 60Hz).

Placed close against the wall the broad bass becomes altogether too strong. The main difference between this and the miniatures is that here a similar overall balance is achieved as long as the speaker is kept well clear of walls, which ought to bring benefits in reduced coloration and improved imaging.

Ought to is the operative word, because although the overall balance looks pretty good, it's plagued by a significant amount of local unevenness, the trend consisting of a switchback series of small peaks and troughs.

Sound Quality

The listening panel rated the *L20* significantly below average, an uninspiring finding if acceptable enough for the price. Certainly the speaker creates

a lively and quite big sound that is initially attractive, but it also somehow lacks solidity and substance and fails to inspire listener involvement.

Despite a touch of 'thump-and-tizz', the end result is sweet enough, but also somehow unsatisfying. There's plenty of detail and nice out-of-the-box stereo, but timing is a bit slow and the dynamics seem a bit soft. Coloration is tolerable enough, though by no means negligible.

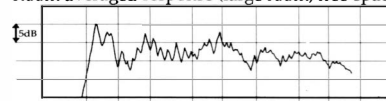
Conclusion

The *L20* has many of the characteristics of a miniature wall-mount, but with greater sensitivity and a balance that optimised for free space siting. It's pleasant enough to listen to, but didn't quicken the pulses of the panelists, as it reproduced music somehow lacking both substance and drama. At the end of the day, the *L20* is simply unexceptional for its £250 asking price; or maybe it's just about ready for retirement.

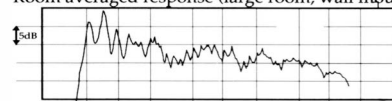
TEST RESULTS

Size (h x w x d)	39x23x20.5cm
Weight	7.5kg
Recommended amplifier power	15-75W
Recommended placement	stands in free space
In room averaged response limits 50Hz-10kHz	+/-7dB
Large room/space LF rolloff (-6dB ref midband)	48Hz
Large room/wall LF rolloff (-6dB ref midband)	45Hz
Large room output at 20Hz (ref midband)	below -20dB
Estimated midrange sensitivity (ref 2.83V, 1m)	87dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£249

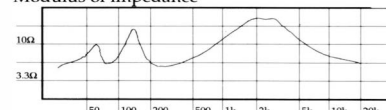
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance

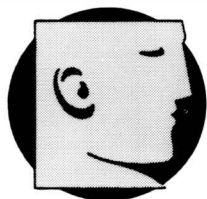


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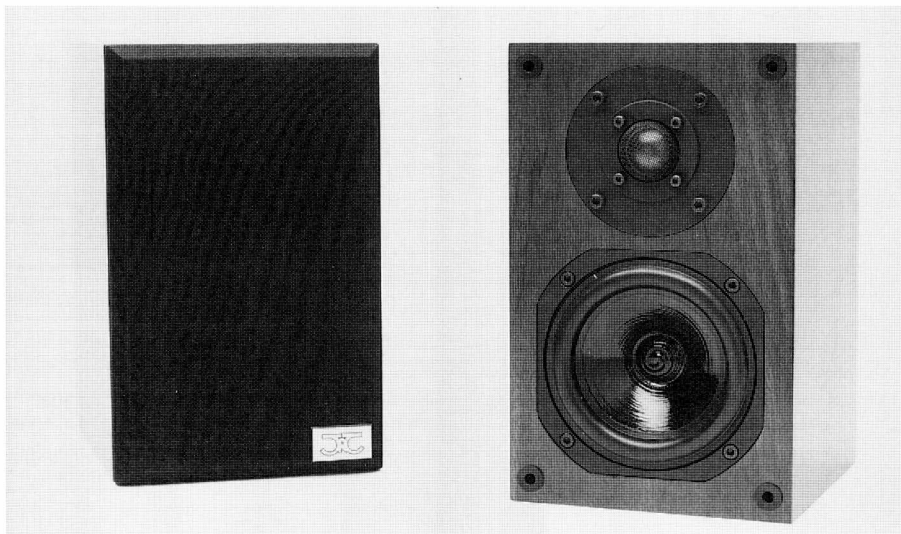


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Recommended



Choice's attention was originally drawn to JRT Loudspeakers on seeing a favourable review of this tiny little miniature in a rival magazine. Julian Taylor, at the end of the telephone, elected instead to send in his much larger AD1 model, which turned out to be one of the higher spots of the reviews in issue 86.

It's therefore high time that we got to grips with the £389 AD1 Micro that set the ball rolling. It's not all that much cheaper than its much larger stablemate, which might seem a bit surprising until you look at the economics of building a low volume specialist product to a high standard. Both have drivers, crossovers and terminals of similar quality; both will take just as long to put together; the only cost differences come in carpentry, wood, packing and transport.

As miniatures go, it's smaller than most, and can just be used on *Kan* stands if they're (the stands of course) turned sideways on. Through a misunderstanding, *Kan* stands (and Slate Audios) were used in the test programme. Having finished all tests we discovered that JRT recommends and supplies a Foundation variant *Sir Fred*. Follow up auditioning is being organised.

The presentation is beautiful, with a lovely oiled real wood veneer on five faces, the drivers neatly rebated to make the front flush. Only the grille mounting lugs spoil the appearance, apart from the grille itself of course, which can be wrapped in a plastic bag and left inside the packaging just in case you want to resell the speakers one day. The little metallised soft dome tweeter has its own protective mesh.

Although we normally dismantle speakers (after the listening is done) so as

to report on the innards, JRT frustrated this procedure by making both drivers and terminals non-removable, even after removal of the formers' big and reasonably tight machine-head screws. Quite what happens should you happen to blow a driver is anybody's guess, but it does ensure fine mechanical integrity for the little 90mm plastic cone with its odd spiral pattern sealed dust cap.

Test Report

Sensitivity is usefully high by miniature standards, and just about average against the market as a whole, while the impedance represents a simple load for the partnering amplifier. The trade-off is of course in the bass extension, the *Micro* making little attempt to do much below 50Hz (in room).

The midbass is usefully reinforced by wall loading, the end result being a little recessed in the lower midrange, a little prominent in the octave above that (round about 1kHz), and with some loss of energy in the presence region. But the overall balance is pretty good, albeit with a bit of a sting at very high frequencies.

Sound Quality

The slightly above average panel test rating reflects the dilemma that this is not necessarily a comfortable speaker to listen to, but it is communicative, coherent and informative, both of the music playing and the rest of the components being used in the system.

The balance errs on the bright side, which tends to emphasise surface noise from vinyl discs. The lack of genuine scale and weight is of course evident enough, depending somewhat on the type of material. The sound may lack slam, but

not speed, and in consequence shows great life and impressive dynamic differentiation, even at bass frequencies. There's little boxiness, and an impressively substantive image is generated, with fine positional detail alongside a good impression of real performers playing.

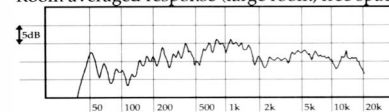
Conclusion

The *Micro* is a shade on the expensive side for its level of refinement, but not for its ability to communicate the messages within the music. It's sufficiently sensitive to the quality of rest of the system to make an excellent choice for the enthusiast with a smallish room, and is very responsive to 'fine tuning' the overall sound according to siting, stands and cables - quite a little jewel in fact, and definitely deserving Recommendation.

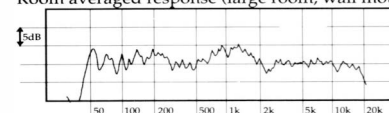
TEST RESULTS

Size (h x w x d)	28 x 17 x 21 cm
Weight	6 kg
Recommended amplifier power	20-70 W
Recommended placement	high stands close to wall
In room averaged response limits 50Hz-10kHz	+/- 5 dB
Large room/space LF rolloff (-6dB ref midband)	50 Hz
Large room/wall LF rolloff (-6dB ref midband)	48 Hz
Large room output at 20Hz (ref midband)	below -20 dB
Estimated midrange sensitivity (ref 2.83V, 1m)	87 dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£389

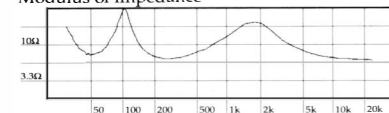
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



Kammerzelt Reference Mini Monitor

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Friedrich Kammerzelt is an amplifier and speaker manufacturer from Hokkenheim in (West) Germany. Kammerzelt Audio Labs' valve preamps and four speakers have carved a small home market niche, but are new to the UK, despite having appeared at two UK Penta shows. A dealer network was being established at the time of writing, so there should be some availability by the time this issue of *Choice* appears.

These *Reference Mini Monitors* are clearly another 'luxury miniature' contender, a small but growing sector of the market that is seeing a number of interesting new entrants. £545 is a great deal of money by miniature standards, though Acoustic Energy's *AE1* has succeeded at an even higher price. It all comes down to the individual's priorities.

If all things were equal, a good big 'un would beat a good little 'un any day of the week, but things are never equal in loudspeakerland. There are precious few (if any) good big 'uns around, and if you're prepared to sacrifice a little scale and a bit more welly and loudness capability, the miniature makes a lot of sense (even disregarding domestic harmony brownie points).

The Kammerzelt looks both pretty and very well built, as the 6kg all up weight would tend to confirm. The very solid wood veneered cabinet (with a choice of four finishes as standard, virtually any to order) has a nice angled 'nose' on the baffle edges, which is continued onto the (better avoided) grille. It's a reflex box, with a slot port along the bottom baffle edge which extends a fair way back,

further strengthening the 16mm MDF enclosure.

The inside is virtually undamped, apart from a layer of foam over the back panel. A complex hardwired crossover with massive components is fed from a single pair of gold-plated terminals, and in turn feeds the drivers along hefty audiophile cabling.

The main driver combines a massive magnet and cast frame with a tiny 75mm paper cone, while the tweeter is a 19mm soft dome, nicely finished with light foam faceplate damping. Although only secured with woodscrews, all were really well tightened up.

Test Report

Unlike most continentals, this is a simple 8ohm load, easily driven without straining the power supply of any amplifier. Sensitivity is somewhat below average, constraining the loudness that can be attained, though Kammerzelt quotes 120W power handling.

Bass extension isn't much to write home about either, cutting off quite sharply below 50Hz in our smallish room. Although the *RMM* can be used close to a wall, it's better balanced when pulled well clear. Even so the balance isn't that flat, with a broad midrange plateau, 300Hz to 1.5kHz, and a downwards step of several dB in the transition from main driver to tweeter (far field measurement).

Sound Quality

The *RMM* did pretty well on the panel tests, though as usual listeners had the difficult task of balancing the strengths

against the slightly restricted scale.

Voices communicate particularly well, and the overall balance is very nicely judged, especially the relative treble level, though the presence is just a little shaded. The bass shows good detail and dynamics, with surprising speed and weight, if slightly 'rubber band' in character.

Pace is measured, with good flow and logic, and the sound is notably free of boxy effects with lovely stereo spread and exceptional focus. Performers sound like real people, voices almost caressing the listeners, while the basically kind sound is pretty informative and dynamic, if a shade on the romantic side of fast.

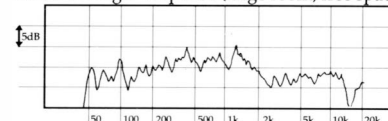
Conclusion

When we originally received the *RMMs*, we were told the UK price was expected to be around £350, which would certainly have guaranteed enthusiastic commendation. £545, however, comes as a bit of a shock. It's still a very good loudspeaker indeed, but needs to be rather nearer perfect to justify such a high price for such a small box. Its strength lies in fine build and a finely balanced sound that cleverly combines good resolution and transparency with an essentially kindly nature.

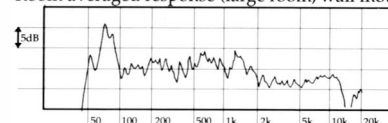
TEST RESULTS

Size (h x w x d)	27x17x24cm
Weight	6kg
Recommended amplifier power	20-100W
Recommended placement	high stands 30-60cm from wall
In room averaged response limits 50Hz-10kHz	+/-6dB
Large room/space LF rolloff (-6dB ref midband)	50Hz
Large room/wall LF rolloff (-6dB ref midband)	50Hz
Large room output at 20Hz (ref midband)	below -20dB
Estimated midrange sensitivity (ref 2.83V, 1m)	85dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£545

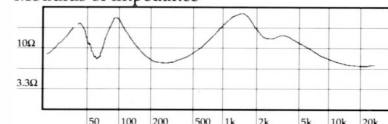
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



Meridian Argent 2

MERIDIAN AUDIO LTD, ECCLESTON ROAD, TOVIL, MAIDSTONE,
KENT ME15 6QP. TEL: (0622) 672269



Hitherto, Meridian has concentrated on active drive systems - speakers with built-in power amplifiers. Now the company is launching a range of passive loudspeakers, collectively dubbed *Argent*, the £995 A2 being the subject of this review.

A thousand pounds is a lot to pay for any loudspeaker, never mind one that requires some sort of stand or support as well. However, this is only a reflection of the way the marketplace has been inexorably moving over the past decade, towards smaller but more elaborately engineered units.

The *Argent 2* certainly feels reassuringly solid, and is as beautifully presented as anything to come out of the Meridian operation. The enclosure itself is built from 19mm MDF, with 22mm thickness used for the baffle, port loaded by a resistive tube set into the baffle below the main driver. It's elaborately damped internally, with bitumen pads, a foam lining and then a good filling of absorbent, while extensive bracing is used to stiffen all panels in all directions.

The cast frame main driver has a Kevlar matrix fibre yellow cone, an enormous magnet, voice-coil and phase plug. It was secured by six machinehead coarse woodscrews, which were not that tight and which don't bite into the full depth of the baffle. The action of removing a driver (to inspect the internals) caused a lot of swarf to scrape off the frame, which might be of less consequence had not the voice coil been left open to possible pollution around the pole-piece. When I reassembled the unit, carefully tightening the screws by hand, one had already lost its thread. The manual suggests tightness should be regularly checked, and cautions against over-tightening, which in my

interpretation sounds suspiciously like the engineering equivalent of opening the mouth in order to insert the foot.

The 25mm metal dome tweeter with horn flare was nice and tightly fitted, while an elaborate terminal block with bi-wire gold plated connectors is set into the rear panel. This acts as the mounting for a highly complex crossover which uses massive components.

Test Report

Although Meridian claims 89dB, according to our assessment (far field in-room) the *Argent 2* has a sensitivity of around 85dB, which is comfortably below average. That said, the bass extension is exceptional for the size, matching most of the floorstanders in this issue without any help from upper bass richness, and the amplifier load is kind too.

Apart from a significant notch in the crossover region, the response is unusually smooth and even from low bass up to 2kHz, while the treble level looks very well judged, the overall trend being gently downtilted from bass to treble. The bass end is very well controlled, and the company's recommendation to site at least 20cm from the wall looks about right.

Sound Quality

This Meridian had a pretty disastrous time on the listening tests, with widespread criticism of a lack of life and coherence, a ponderous, detached bass and little transparency, even though the balance was clearly even and extended.

When replicating the panel conditions for more extensive listening, I couldn't disagree, even though the smoothness is its own reward, and the speaker responds

well to higher power levels. What I did discover was that *Argent 2* is very responsive to cable changes, and is capable of much greater transparency than I originally realised.

Even more dramatic was the effect of changing the stands. The largish enclosure may have looked ungainly on the small top plate, but the sound quality when used with the Slate Audio stands proved a revelation, in much the same way as it had with Celestion's *SL6Si*. Much boxiness and congestion vanished, revealing control and smoothness which tends to highlight the laid back balance and darkened presence, alongside decent but not exceptional speed and good low end weight (probably also linked to the stand). Only after the event did I discover that Meridian supplies a Slate-sourced stand, 45cm high, as an expensive optional extra.

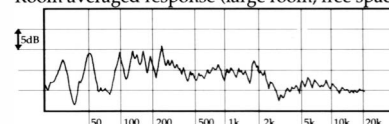
Conclusion

By the time the van arrived to collect the speakers, I had begun to appreciate that *Argent 2* has great potential, much of which hadn't been fully extracted. Its sheer transparency and sensitivity to system optimisation is both a strength, in terms of the potential that can be achieved, and a weakness, in the difficulty of doing so. Capable of great subtlety, smoothness and refinement, it's an enthusiast model that deserves to be taken very seriously indeed - or will do once the main driver fixing is more satisfactorily executed.

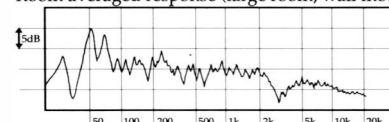
TEST RESULTS

Size (h x w x d)	48.5 x 21 x 29.5 cm
Weight	13 kg
Recommended amplifier power	20-100 W
Recommended placement	Slate stands in free space
In room averaged response limits 50Hz-10kHz	+/-6 dB
Large room/space LF rolloff (-6dB ref midband)	23 Hz
Large room/wall LF rolloff (-6dB ref midband)	23 Hz
Large room output at 20Hz (ref midband)	-8 dB
Estimated midrange sensitivity (ref 2.83V, 1m)	85 dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£995

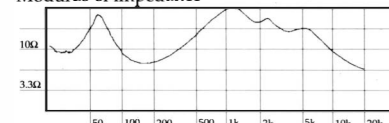
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



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Although the focus of most attention was fixed firmly on its brand new 760 and *Cyrus* 780 'babies', Mission also chose 1990 to launch an improved *i* version of its large but relatively inexpensive floorstanding model, the 764.

Said model was perhaps our least favourite in the range, suffering somewhat from the 'big econobox' syndrome, and actually sounding less poised and together than the slightly smaller and cheaper 763. Precisely what has changed to justify the *i* suffix is not made clear in Mission's Product Information Guide, and our measurement procedure has changed sufficiently since issue 71 to make direct comparison impossible.

What we have here is a lot of loudspeaker for £450. It's a big floorstanding 50 litre reflex box, the baffle attractively if assertively packaged in the modern idiom, and the box covered in a choice of real wood veneers. Optional

spikes may be fitted for proper floor coupling, though these are a trifle on the flimsy side.

The drive system is a conventional enough two-way configuration, including a bass/mid unit with 165mm plastic cone/dust cover, powerful magnet and die-cast frame, plus a 25mm fabric dome tweeter with short elliptical horn flare. The port is a generous plastic tube, neatly styled, while the grille should do little harm - use or not, according to taste.

The enclosure engineering hasn't been skimped either. The baffle is hefty 25mm MDF, while the sides are 19mm chipboard, and a couple of braces stiffen the periphery. Some panels are damped by bituminous pads, and the box itself is well stuffed with wadding - more than usually found in a ported enclosure.

The drivers are secured by bolts and T-nuts, which could have been more tightly done up. The bi-wire or bi-amp terminal block is cleverly arranged to accommodate the generous components used in the quite complex hardwired crossover. Heavy multistrand cables connect the drivers internally, which is perhaps surprising in view of Mission's advocacy of solid-core cables.

Test Report

We can't agree with Mission's claimed 90dB sensitivity rating, finding 87dB a more realistic figure for our samples and measurement conditions. Still, that's in the context of quite exceptional in-room bass extension and an easy amplifier load. It's interesting to note that the normal 'double hump' of a ported system is not visible, so either the port is tuned to around 20Hz, or it has been damped out of existence.

Although the company recommends placing this speaker within 30cm of the wall, our traces suggest that leaving a little more air around them improves low frequency balance, partly at the expense of midband smoothness. It's a tricky trade-off, so careful experimentation is essential. Whichever is adopted, the overall balance is impressively flat overall, albeit with the odd peak or trough here and there. The crossover region is particularly well integrated.

Sound Quality

Despite the obviously generous scale and bandwidth, all but one member of the panel gave a below average rating, basically because the weaknesses, largely due to the size of the box, were judged more obvious than the strengths. Despite

the nice bandwidth, the bass is a bit detached and waffly. There's some attempt at focus, but timing could certainly be sharper, and overall coherence is definitely wanting, robbing the sound of genuine substance, authority and solidity, while the treble gets a bit spitty if one sits too close to its axis.

Subsequent experiments substituted *Cyrus* solid core cable for the multistrand that had been in use. There were certainly significant differences between the two, but not a solid preference for one. Solid core sweetens sound and focuses the midband and voices rather well, but the bass becomes even less distinct. It can sound like a separate subwoofer system, sing-along-a-wardrobe style, all of which I found a bit wearing.

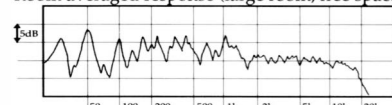
Conclusion

Whatever the improvements that have been incorporated in this latest version of the 764, they're insufficient to transform it into a sonic swan. Wallowing and coloured bass let down its predecessor, and much the same result comes out of this latest test programme. The physically perceived value remains very good, but the sound side of the equation doesn't really add up.

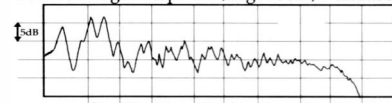
TEST RESULTS

Size (hwxwd)	88.5x25x32.5cm
Weight	17kg
Recommended amplifier power	20-100W
Recommended placement	try 30cm-60cm from wall
In room averaged response limits 50Hz-10kHz	+/-5dB
Large room/space LF rolloff (-6dB ref midband)	below 20Hz
Large room/wall LF rolloff (-6dB ref midband)	below 20Hz
Large room output at 20Hz (ref midband)	-5dB
Estimated midrange sensitivity (ref 2.83V, 1m)	87dB
Impedance characteristic (ease of drive)	good
Typical price per pair (inc VAT)	£450

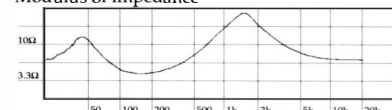
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



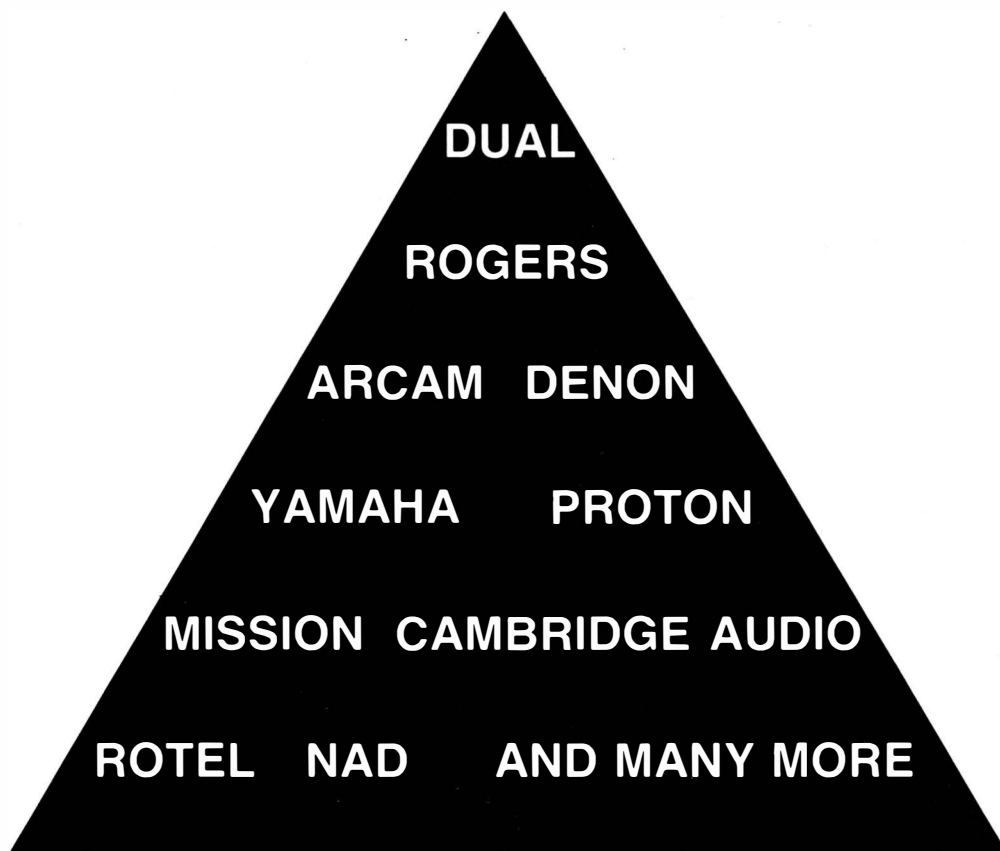
Modulus of impedance



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Recommended



Monitor Audio has not had a good run in recent *Choice* loudspeaker reviews - to the point where diplomatic relations seemed to be in some danger. Happily, the *Monitor 11* arrived on the doorstep just in time for inclusion in this project - and just as happily, it looks like the most promising MA model for some time.

For years Monitor has enjoyed much success with a clutch of medium size stand-mount speakers priced £300 - £400, with a variety of sizes and finishes. The £300 *11* fits in perfectly with the value-for-money side of this tradition, as does its 30cm taller £380 *14* sibling. Both also build on the success enjoyed by the smaller 7 and 9, which introduced this particular style of MDF cabinetwork.

The box is fashionably slim and quite tall for a bookshelf or stand mount design, partly no doubt as a function (or determinant) of the twin main driver 'two-and-a-half-way' arrangement. Two apparently identical bass/mid drivers are fitted, one operating just to augment the bass where a large cone area is an advantage, the other carrying on up into the midrange where its small size helps promote good crossover integration to the tweeter. It's an arrangement that sounds fine in theory, but which designers often find difficult to put successfully into practice.

All is finished in an attractive shiny black paintwork, the drivers bolted straight to the baffle with well-tightened T-nut screws. The rather plain grille is better left unused, partly because the speaker looks prettier without it, but also because the baffle is narrow and the frame

rather thick, while the 25mm metal dome tweeter has its own protective mesh cover.

It's not a particularly heavy loudspeaker for its size and configuration, largely because the very strong MDF panels are only 11mm thick. Extra figure-eight bracing is applied to stiffen the longer panels, and all is lined with pads of acoustic foam. A bi-wire or bi-amp crossover is fitted behind the twin terminals, and all connections are hardwired. The main drivers are simple low-tech affairs, with 110mm doped paper cones, small magnets and pressed steel frames. The tweeter is mounted on a heavy cast faceplate.

Test Report

The *11* achieves average sensitivity without resorting to a current hungry low impedance, and manages pretty good low frequency extension too, especially considering the compact dimensions.

However, as is often the case with twin main driver systems, the overall bass level is a little strong in relation to mid and treble, whether or not wall reinforcement is augmenting the 50 to 100Hz octave. In practice free space siting was subjectively preferred, some added 'body' from 100 to 400Hz being the inevitable but tolerable consequence.

Elsewhere the response is pretty well balanced with a slightly downtilted characteristic, though still somewhat uneven with it. The presence and crossover regions are well handled, but the treble does seem to focus rather around 5-10kHz, especially in the context of the slight energy loss in the octave below.

Sound Quality

The *Monitor 11* managed to scrape its way into the top ten of the test group, which is creditable enough for a £300 model. Although it does nothing exceptionally well, there is very little deserving serious criticism either. The extra 'body' is not unattractive, making the speaker easy to live with whatever one's taste in music, though spoken word radio does sound a touch 'chesty'.

The presentation is a shade thumpy and thick in the bass, the treble is slightly detached, and the overall sound is a little slowed, but the whole still manages to sound lively, bouncy, mostly coherent and above all enjoyable. The balance certainly suits CD rather better than vinyl.

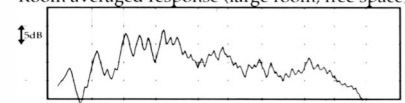
Conclusion

Fashionably good looking and respectable enough material value for money, the whole comes together even better than the sum of its constituent parts. One might pick nits in both the measured and subjective performance, but the whole package is a well balanced compromise, which is what the art of speaker design is really all about. Recommendation is entirely appropriate.

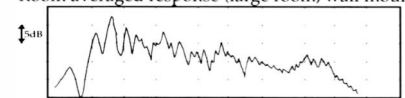
TEST RESULTS

Size (h x w x d)	52 x 20 x 24 cm
Weight	8 kg
Recommended amplifier power	15-100 W
Recommended placement	stands at least 30 cm from wall
In room averaged response limits 50Hz-10kHz	+/-7 dB
Large room/space LF rolloff (-6dB ref midband)	48 Hz
Large room/wall LF rolloff (-6dB ref midband)	30 Hz
Large room output at 20Hz (ref midband)	-12 dB
Estimated midrange sensitivity (ref 2.83V, 1m)	87 dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£300

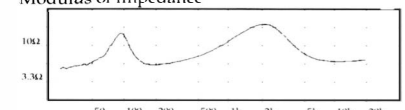
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)

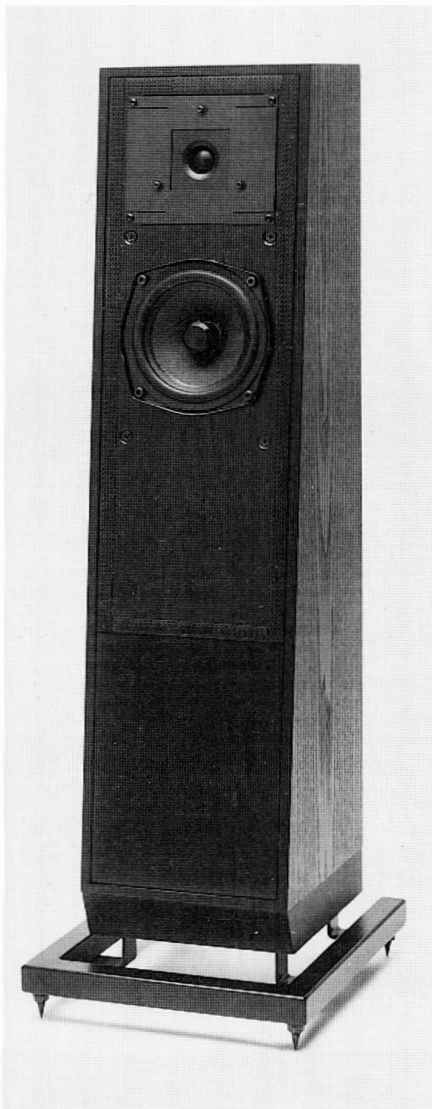


Modulus of impedance



Naim NA IBL

NAIM AUDIO LTD, SOUTHAMPTON ROAD, SALISBURY,
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The *IBL* is the smallest of three Naim models, and the first to come under *Choice* scrutiny. It's a very compact floorstanding speaker for use close against a wall and costs a surprisingly expensive £800.

Smallness is its own virtue of course, especially here in the UK. The bottom line is that an *IBL* takes up rather less room space than a seven litre miniature on a stand, yet has a larger box volume and looks quite cute too, the baffle slanting backwards a few degrees.

The stand is a permanently fixed part of the package. It sticks out an inch or two all round the speaker itself, which looks a little odd, though increasing the footprint thus makes good mechanical sense.

Although it may appear expensive for the material content, the *IBL* does include several rather unusual and creative design ideas. It is also exceptionally and consistently well built, all of which offers some justification for the price.

Constructed in nicely veneered 19mm MDF, the box shape is inherently tough. It consists of three boxes in one, the divides and inset rear panel providing further stiffening. The tweeter has its own section at the top, for reasons we'll come to in due course. The little main driver works into a small enclosure immediately behind, but that in turn is connected via an acoustic resistance panel to the main enclosure below. It's an arrangement whereby, as I understand it, the driver 'sees' a large enclosure, but the smaller chamber helps control large cone movement.

I first encountered a spring-decoupled tweeter not long ago, and was mightily impressed by the treble delicacy of Roksan's *Darius*. Naim's application is considerably more elegant, using a leaf-rather than coil-spring arrangement which merely requires a carefully slotted faceplate. Gas pressure sealing is lost, hence the sub-enclosure.

Tightly fitted, the main driver uses a tiny 85mm paper cone with phase plug extending from the pole piece, driven by a massive magnet mounted on a pressed steel frame. A tuned mass damper is fitted to the magnet, and I understand more are used on panels in the main enclosure. Subtle attention to detail is seen in the careful baffle scalloping around the rear of the driver.

Heavy cables connect the drivers to an external encapsulated crossover mounted on the rear panel. There's no bi-wire/-amp option, but direct driver access is available for active drive, using Naim's electronic crossover.

Test Report

Sensitivity, at any rate through the main fundamental range, is well below average, though the load is easily driven. The bass extension is pretty respectable for the size, if limited compared with many floorstanding models.

In view of the manufacturer's siting recommendations, the room curve was only taken close against the wall. Even under these conditions the bass balance is on the dry side, so wall reinforcement is clearly essential. It does a very effective job both in terms of low frequency evenness and in matching the treble level.

The problems occur in between. The midrange starts rising from about 500Hz, to the point where it's nearly 5dB too strong, 1kHz to 1.5kHz, which is bound to have significant subjective repercussions. Elsewhere the crossover is nicely integrated, the treble smooth and well balanced.

Sound Quality

The *IBL* only rated about average in the listening tests, which is disappointing for one of the most expensive models tested, though entirely explicable nonetheless in terms of a frequency balance which is well outside the norm.

As the measurements predict, the *IBL* sounds light in the bass and peaked up in the midband. With no bass waffle going on to disguise it, the combination creates midband coloration that is impossible to ignore, even though tolerance varies from one individual to another.

Hands-on listening makes it plain that this is a very interesting loudspeaker indeed in several other respects. The treble has a delicacy and dynamic subtlety that strengthens the argument for baffle decoupling, while the bass (what there is of it) is remarkably clean, even and uncoloured. Speed and timing are near the top of the class, and dynamics exceptional, if perhaps a bit hyped. On the end of a sympathetic system the whole experience can be vastly entertaining - provided you can handle that peaky mid.

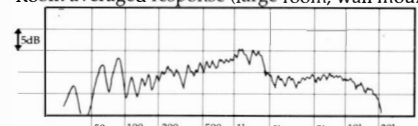
Conclusion

Naim's *IBL* has many good qualities and clever ideas. But speaker design is also about balance, and that's where this one trips up. Some will be able or indeed happy to live with the projected forwardness, others may endure it for the sake of the very real strengths in other areas, but general recommendation doesn't seem quite appropriate.

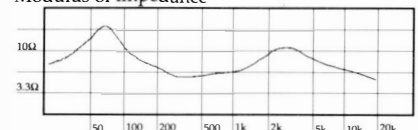
TEST RESULTS

Size (hwxwd)	80x18x15-20cm
Weight	12kg
Recommended amplifier power	20-70W
Recommended placement	close against wall
In room averaged response limits 50Hz-10kHz	+/-6dB
Large room/wall LF rolloff (-6dB ref midband)	30Hz
Large room output at 20Hz (ref midband)	-17dB
Estimated midrange sensitivity (ref 2.83V, 1m)	84dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£798

Room averaged response (large room, wall mount)

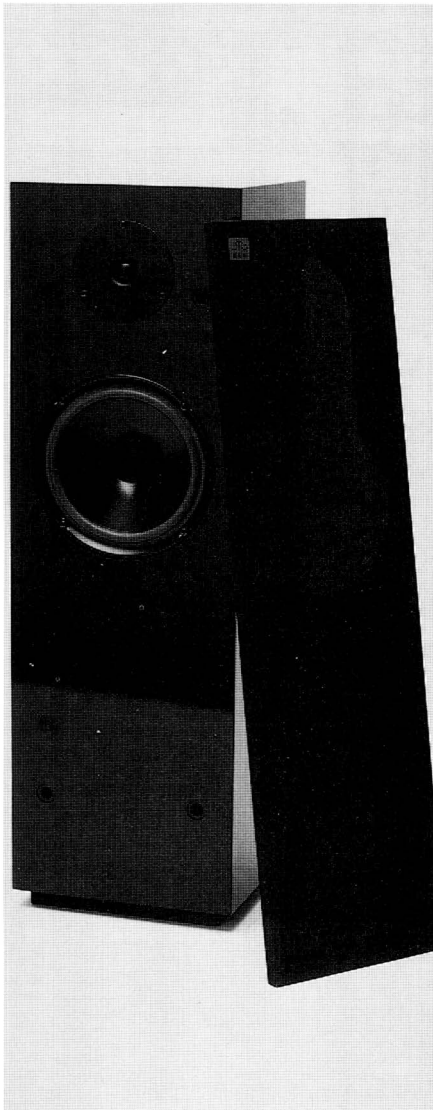


Modulus of impedance



RAM Hermes

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WITNEY, OXON OX8 6UB. TEL: 0993) 771174



Those with long memories will doubtless recall the RAM brand from about a decade ago. Although it apparently disappeared, presumably during one recession or another, in reality the company was purchased by Belgian interests and has been trading elsewhere in Europe for some time. Now the brand is being reintroduced to Britain by Oxford Distribution.

The £450 *Hermes* belongs to the emerging category of compact luxury floorstanding models that have been appearing and frequently impressing me over the past year or two. One of the (presumed and possibly fallacious) advantages of this configuration is that it's not necessary to purchase stands as well. The money goes into the speaker, not the support, though in this particular instance the whole business of floor support seems to have been largely ignored.

Hermes is no larger in volume than a

conventional bookshelf loudspeaker, but is shaped very slim, narrow and tall so it may be placed directly on the floor. However, there's no provision for fitting spikes to ensure decent mechanical floor coupling, while the footprint/height ratio looks decidedly unpromising. The cabinet itself is less than a foot deep, and RAM has only compounded the situation by mounting it on an even smaller plinth.

Our samples were particularly well finished, in a lovely piano-black lacquer on all five visible faces. The grille looks a pretty dreadful affair from an acoustic point of view, but fortunately the speaker looks pretty good without it, thanks to the rebated drivers (but no thanks to the exposed main driver frame and ugly grille mounting sockets).

The box itself is constructed from substantial 18mm MDF, is loaded by a short, large diameter reflex port and is lightly filled with damping material. The PCB crossover is fairly simple and uses top quality components, feeding the drivers with really heavy hardwired cables.

The main drive unit uses a 125mm doped paper cone, a pressed steel frame and a surprisingly small magnet. The drivers were tightly secured, but only with small coarse woodscrews.

Test Report

Our sensitivity rating is a high 90dB, give or take several dB depending on the frequency chosen for measurement. Partly that's due to a Eurostyle low impedance characteristic that will demand extra current from the partnering amplifier, but it's a decent enough figure for a small enclosure even so. However, the price is paid in bass extension which is rather unexceptional despite the overstrong midbass.

The responses are quite ragged and uneven wherever the speakers are placed. Free space and well clear of walls is the obvious starting point, though the midbass, port tuned to 55Hz, is still rather too enthusiastic. The overall balance is pretty good above 200Hz, but far from smooth with it, thanks to significant peaks at 1.2kHz and 5kHz, with a concomitant trough failing to fill the gap between. The upper treble is also rather uneven.

Sound Quality

Perhaps reflecting confusion created by the balance anomalies, which certainly made level matching a rather haphazard affair, the panel delivered unusually inconsistent results.

The 'three-humped' frequency balance is notorious for its ability to fool listening panels. First you notice that the bass packs a good thump, then that the midrange is nicely encapsulated and projected, while the tinkle at the top is further reassurance that all is well. It's all too easy to overlook the bits that are missing in between, and that the three bits aren't glued together very well.

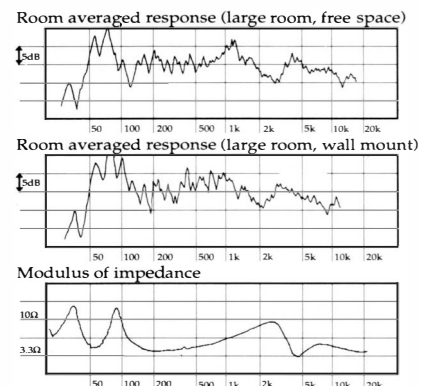
Hermes has rather more than its fair share of colorations, but is nevertheless quite an entertaining experience, even though the glue between the bottom and the middle isn't really up to the task. The bottom end thumps away creating a decent sense of scale without any great precision, while the top end is a bit abrasive too. The midband, where much of the real musical action is, focuses and communicates rather well, sounding lively, dynamic and quite solid, with a generous, if not entirely precise, soundstage.

Conclusion

It's interesting to note the parallels between *Hermes* and the Equation *O*, a much more expensive model distributed by Oxford that nevertheless shows many similarities in size, shape and performance. The Equation may cost thrice the price, but it pays proper attention to floor coupling and is much the more polished performer. Lacquer finish notwithstanding, *Hermes'* lack of sonic polish rather lets it down.

TEST RESULTS

Size (hwxwd)	70x21.5x23cm
Weight	11kg
Recommended amplifier power	10-70W
Recommended placement	cones clear of walls
In room averaged response limits 50Hz-10kHz	+/-7dB
Large room/space LF rolloff (-6dB ref midband)	40Hz
Large room/wall LF rolloff (-6dB ref midband)	45Hz
Large room output at 20Hz (ref midband)	-20dB
Estimated midrange sensitivity (ref 2.83V, 1m)	90dB
Impedance characteristic (ease of drive)	current hungry
Typical price per pair (inc VAT)	£425



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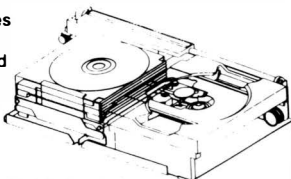
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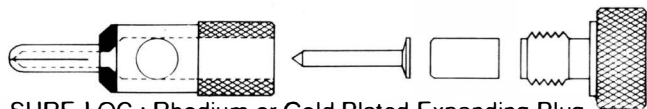


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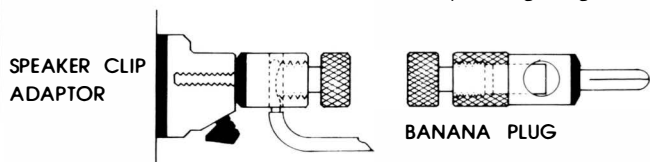


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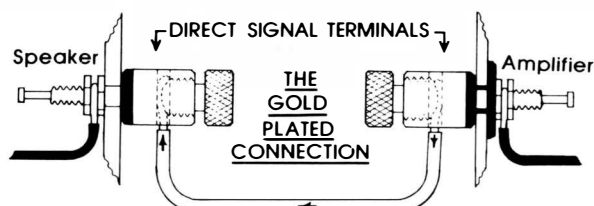


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Royd A14 II

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Recommended



I've been rather fond of the Royd speakers I've heard so far, and have also built up a healthy respect for one of the pioneers of the 'small is beautiful' trend. Anyone with the commercial temerity to offer six identically sized models across a three to one price span, which are differentiated purely by engineering content and sound quality, certainly deserves some respect.

What this review should establish is whether Royd's obvious mastery of the seven litre 'miniature' box is matched when the enclosure volume is doubled. I recollect trying an *A14* the best part of a decade ago, but this *Mark II* version is very different, and currently retails for £199.

It's certainly a big enough box for the money, though undeniably an ugly one too. Devoid of any decoration, the rather squat shape gives a somewhat dated impression, harking back to the pre-designer era. What you do get, however, is a pretty solid helping of engineering content for your money, exemplified by an all up weight of 8kg. The grille is a rather hefty and severe affair, though it's nicely chamfered and doesn't have a detrimental effect on the sound.

Unlike most Royds, and despite the fact that a little foam pad inset into the rear panel looks for all the world like a damped port, this is a sealed-box design. There's nothing particularly special about the cabinet, which has a 19mm baffle and 15mm sides, is unbraced and lightly damped with absorbent. The most important extra is a heavily damped aluminium tube that braces the back of the main driver magnet to the rear panel. Besides well-tightened screws, the drivers are actually glued into place, ensuring good mechanical integrity.

The crossover is minimalist, with no

bi-wire or bi-amp option. The main driver has a hefty magnet, pressed steel frame and light 115mm paper cone with very lossy surround. The treble is handled by a small 19mm soft dome with short horn flare.

Test Report

With sensitivity close to average, a kind amplifier loading characteristic and bass extension that is better than most, the overall parameters of the *A14 II* have been very sensibly chosen to suit most rooms and systems, allowing for the creation of rather more welly than most bookshelf models can normally manage.

Although the overall balance looks pretty good, the responses could certainly be smoother. The upper mid and presence region (2-4kHz) is slightly forward, and the overall treble is several shades stronger than the norm, and distinctly ragged close to the limit of audibility. Siting should be fairly uncritical, about 30cm from the wall providing roughly the right degree of reinforcement in our test room.

Sound Quality

The *A14 II* passed muster on the blind listening tests, without in any way distinguishing itself. Most listeners reacted positively to the good sense of timing and the foot-tapping, well-extended bass, but also criticised the rather brash and uncomfortable presentation of high frequencies, attempting to arrive at an overall judgement that combined these observations.

Subsequent seen experiments largely confirmed the findings with the *LK20* cable used for the blind tests. Substituting *Cyrus* solid-core sweetened things considerably, albeit at some price in bounce and speed,

while Naim *NACA4* turns out to represent a very good compromise (whereas *NACA5* sounds altogether over the top).

Although the rough edges remain something of an impediment to relaxed enjoyment, the very fact that the *A14 II* proved so transparent to these changes is itself highly impressive.

Conclusion

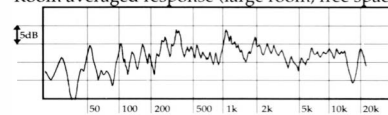
Not the prettiest speaker at the price, the *A14 II* is nevertheless a largely successful attempt at creating a genuinely informative largish bookshelf model, despite its fair share of cosmetic and sonic blemishes. Recommendation is clearly in order, tempered by the warning that this speaker is very sensitive to the precise set-up of the system, and apt to sound aggressive and uncomfortable.

Welcome though this newly revised model is, I can't help hoping that Joe Akroyd will soon turn his attention towards something halfway between his *7s* and *14s*. The ten or 11 litre compact size that sits midway is justly increasing in popularity, offering a worthwhile volume increase over the miniatures without bringing in too many of the extra engineering difficulties of a 14 litre enclosure. They look a lot prettier too.

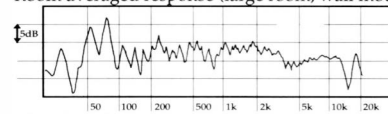
TEST RESULTS

Size (h x w x d)	40x26x23cm
Weight	8kg
Recommended amplifier power	15-70W
Recommended placement	open frame stands 30cm from wall
In room averaged response limits 50Hz-10kHz	+/-6dB
Large room/space LF rolloff (-6dB ref midband)	30Hz
Large room/wall LF rolloff (-6dB ref midband)	30Hz
Large room output at 20Hz (ref midband)	-10dB
Estimated midrange sensitivity (ref 2.83V, 1m)	87dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£199

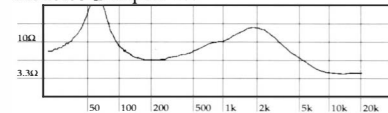
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



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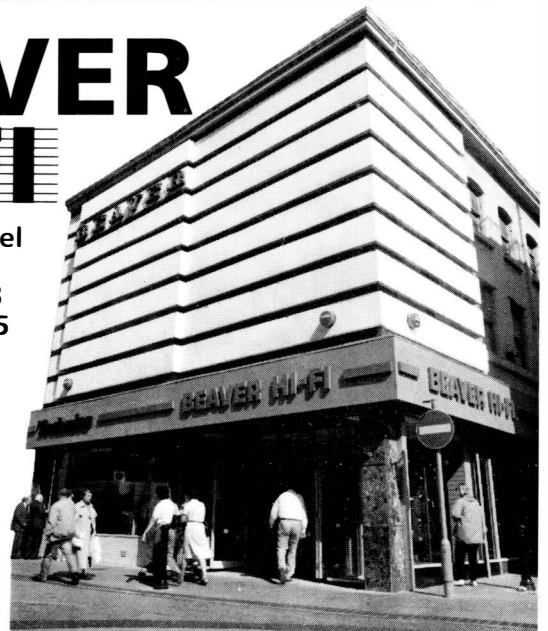
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Tannoy J95

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Recommended



Having engineered a large floorstanding enclosure that's unusually rigid for its size, Tannoy then offers it to purchasers in two alternative forms; the DC3000 (reviewed in issue 78) which is fitted with the latest domestic versions of its famous dual-concentric driver, and the rather more conventional J95, a speaker which looks exactly the same as the '3000 until you remove its grille, yet which costs a staggering £150 less.

This alternative J95 driver line-up has several implications. Whereas the '3000 uses a reflex-loaded enclosure to match its very high sensitivity horn-loaded tweeter, the '95 is aligned at a lower (though still by normal standards high) sensitivity, and therefore uses the enclosure fully sealed.

In marketplace terms then, this is a generous and substantially engineered floorstanding three-way model, with quite sufficient refinement to justify its £499

pricetag. It's nicely enough presented, with real wood veneer all round, and low key baffle decoration, though it's all a bit sombre in black ash. The grille has a neat plastic frame, but is even more sombre.

Maybe I should call it a two and a half way, because the two near (though not quite) identical main drivers operate in tandem over the bass part of the spectrum, the lower one rolling off fairly early and the upper one continuing through the midrange to the tweeter crossover point.

The driver line-up is drawn from the familiar 90 series components. In this instance both main drivers have 150mm polypropylene cones and generous magnets, while the tweeter - now with removable mesh protection - has a 25mm metal dome. All were well secured with substantial woodscrews, the main driver magnets located against gooey damping material and internal bracing, and driven via audiophile grade cables from a complex, good quality crossover with gold-plated bi-wire/-amp terminals.

The enclosure itself is hefty 19mm MDF, with internal crossbracing going every which way and strategic, absorbent fill and lining. An angled partition cuts off the lower 30cm or so, thereby spreading vertical internal standing waves and incidentally allowing the lower section to be filled with lead shot and/or sand for increased stability. Four large and strong adjustable spikes ensure good floor coupling with a reasonably good fore-and-aft footprint.

Test Report

Though it's 4dB down on the '3000, sensitivity is still a very generous 90dB, with a much easier load for the amplifier to drive. In fact the responses are very similar, with a slight advantage in treble extension in this version.

Bass extension is pretty good, as is mid and upper bass control for such a large enclosure. The broad midband of 100Hz to 1.5kHz is well balanced, though the response drops away a full 6dB over the next two octaves, flattening out for the octave following that.

Sound Quality

The J95 passed muster on the listening tests, with praise for the tight extended bass and good dynamic detail, but some widespread criticism of boxiness besides.

However, blind testing is arguably somewhat unfair on a speaker such as this, as all have to be driven at a level within the capacity of the least capable. Experiments soon showed that this

Tannoy has performance in some areas where others are left at the starting gate.

Perhaps because of the sealed box, the bass sounds even better than the '3000. It's quite a boogie box, encouraging the listener to drive it flat out. It delivers satisfying low end thwack with lots of speed and slam, conveying a real sense of authority and hanging together well, even when driven hard.

Scale is not enormous and the upper bass is a bit heavy and boomy here and there. You can hear the box alright, as it drones along with the cones, but it's still a fine effort with good pace and stability, and it doesn't seem to interfere with the flow or drive in the way that big boxes often do.

Stereo imaging is good for a large speaker, and good dynamics are maintained well into the vocal region, though the balance here is a bit laid back and dark. The vocal sound is a little box-bound, rounding the edges somewhat.

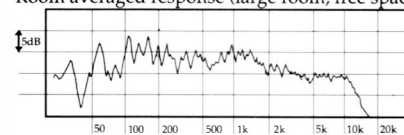
Conclusion

Although it seems to have been somewhat overlooked in the general enthusiasm for the DC3000, in our judgement the J95 is the better overall speaker of the two, and it's cheaper to boot. It may not be the last word in subtlety, delicacy and speed, but has an endearing consistency with genuine dynamic authority unmatched in its class, and should go quite loud enough to satisfy 99 per cent of the people for 99 per cent of the time. Enthusiastically Recommended.

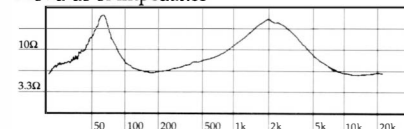
TEST RESULTS

Size (hwxwd)	93x26x32cm
Weight	23kg
Recommended amplifier power	10-120W
Recommended placement	well clear of walls
In room averaged response limits 50Hz-10kHz	+/-7dB
Large room/space LF rolloff (-6dB ref midband)	30Hz
Large room output at 20Hz (ref midband)	-10dB
Estimated midrange sensitivity (ref 2.83V, 1m)	90dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£499

Room averaged response (large room, free space)



Modulus of impedance



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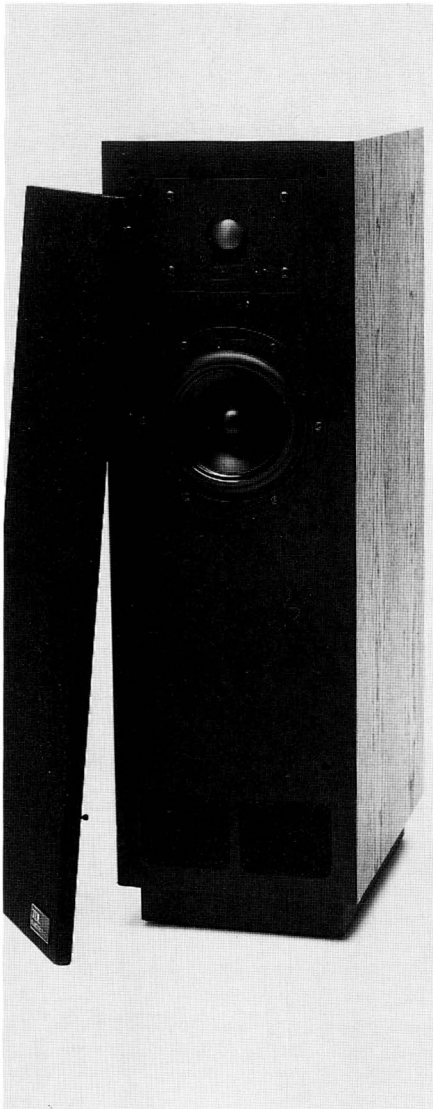
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TDL Studio 0.5

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Following in the footsteps of IMF, TDL specialises exclusively in transmission line loudspeakers, offering a range of half a dozen of different sizes and prices up to £3,000. Two of these have already been favourably reviewed in *Choice*, while the model submitted for this project is the smallest, least expensive and most recent.

Transmission line apart, the *Studio 0.5* clearly belongs to an increasingly impressive class of luxury finish loudspeakers best classified as compact floorstanders. The speaker doesn't incorporate floor coupling spikes; instead a (quite expensive) optional small frame spikes the floor and lifts the speaker a couple of inches.

A transmission line is a type of bass loading that draws on both reflex and tuned column techniques. The idea is to duct the rear radiation from the main driver down a long folded tube, absorbing the higher frequencies whilst using a port

at the end of the line to output bass frequencies to augment the main driver. The main difficulty lies in controlling the relative phase of the two separate bass sources.

The *0.5* is a neat shape, readily accommodated even in small rooms, where it's practical to keep the speakers well clear of walls. Presentation is nice enough, if a bit sombre in the black full height grille cloth and veneer of our samples.

Although the drivers are nicely rebated, the baffle is not a styling feature, being painted (black of course) rather than veneered, so the grille must be considered a fixture, which is maybe a pity in view of its thick frame.

The box itself is built from MDF, with 18mm baffle and 13mm sides, the latter most effectively reinforced and stiffened by the internal partitioning used to form the single fold line. This is filled with an elaborate cocktail of damping materials, whose selection is crucial to the art of transmission line design.

The main driver has a tiny 90mm plastic cone with integral phase plug/dust cap, a big magnet and cast frame, and was well screwed home into six T-nuts. The tweeter uses a 25mm metal dome under a mesh cover, and the generous foam covered port exits at the bottom of the baffle. At the top of the rear panel, twin gold plated terminals feed a quite simple commercial PCB crossover which is hardwired to the drivers with adequate cables.

Test Report

Sensitivity is low, so generous amplification is probably desirable. However, the load won't embarrass even less capable models. Given the sensitivity and size of box, bass extension is surprisingly modest, whereas the midbass is clearly rather too strong wherever the speaker was placed in our test room - two afflictions that the somewhat larger *Studio 1* manages to avoid. Free space siting looks obligatory, and a home trial arrangement is almost certainly worthwhile in case the strong port-related 50Hz output interacts badly with the listening room.

The balance clearly separates out into three distinct bands: the rather strong mid/upper bass; a midrange that is somewhat exposed, especially around 1-2kHz; and a slightly detached though smooth and well balanced treble. Certainly it's far less well balanced than the larger TDLs, partly due to the limited line length but also to the tiny, powerful main driver.

Sound Quality

The *0.5* did well in the panel listening, but we suspect that the balance anomalies tended to work in its favour, since the highlighting of both midbass and upper midrange often does sound initially impressive. Certainly the speaker delivers a good helping of bass energy, creating a good impression of a much larger unit, but there were also persistent criticisms of the quality thereof, in terms of coloration, detachment and information.

On the plus side it sounds quite quick and lively, with good midrange clarity and vocal definition, any coloration from the upper mid forwardness tending to be masked by the bass richness. The treble is well judged too, helping to keep things nice and polite with just a touch of extra sparkle, while stereo imaging is clearly much better than most.

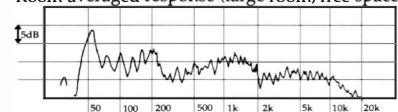
Conclusion

The *Studio 0.5* is by no means a bad loudspeaker, but nor is it in the same class as the larger and slightly more expensive *Studio 1* (reviewed in issue 90), which delivers an altogether better balanced sound, at any rate in the room used for the tests. It's certainly worth trying, as several of the panel were well impressed, but I remain suspicious of the bass quality and its practical in-room predictability.

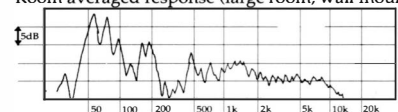
TEST RESULTS

Size (h x w x d)	66 x 20 x 30 cm
Weight	11 kg
Recommended amplifier power	25-75 W
Recommended placement	well clear of walls
In room averaged response limits 50Hz-10kHz +/-8dB	
Large room/space LF rolloff (-6dB ref midband)	40Hz
Large room/wall LF rolloff (-6dB ref midband)	40Hz
Large room output at 20Hz (ref midband)	-17dB
Estimated midrange sensitivity (ref 2.83V, 1m)	85dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£399 (stands extra)

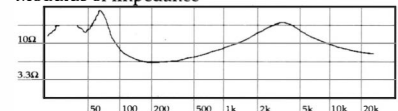
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance





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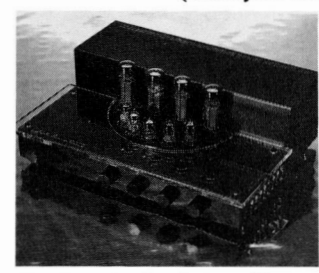
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Wharfedale 410

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Wharfedale has been a dominant force in budget bookshelf loudspeakers since a decade or two before the Dawn of Time. Maestros of the £100 econobox, value for money has always seemed good, and the company has had a knack of anticipating - or setting - market trends, as in the hugely successful *Diamond* series.

The latest *Diamond* (now in *Mark IV* form) came under scrutiny in issue 90, emerging with Recommended honours. This time it's the turn of the third model up the ladder, the £130 410. This has a great deal in common with the *Diamond IV*, but uses a slightly larger box and main driver, and costs an extra £20. Whether the difference is worth the premium must remain to be seen. All too often (for example in the latest Mordaunt-Short range) the next step up brings surprisingly little advantage.

As a package, from a superficial examination of size, weight and constituents, the 410 looks reasonable but not exceptional value for money. It follows the standard bookshelf recipe, distinguished here by the rather unusual grille design that Wharfedale is currently using.

The fabric is actually fitted behind the frame, which in turn clips over the front of the baffle, the fitting itself smoothing out any sagging. It's quite striking, but the edge overlap also makes it look a bit of an afterthought. Some people prefer the aesthetics with it removed, even though the silver dome of the tweeter does look rather exposed.

The baffle is very nicely finished, with post-formed verticals and a mottled textured finish. The drivers are rebated with fixings concealed underneath plastic trim, and were pretty tightly secured to

the substantial 23mm MDF baffle. The rest of the enclosure is more prosaic chipboard, with a light fill of damping material.

The main driver has a 125mm textured, mineral-loaded plastic cone, and a substantial magnet to take account of the loading provided by two identical small rear ports. The PCB crossover is more complex than some, with tagged driver connections.

Test Report

Sensitivity is a usefully high 89dB, some three dB more than the smaller *Diamond*, and achieved without recourse to low impedance except at high frequencies (metal tweeters tend to need all the help they can get). The bandwidth is almost exactly the same as the *Diamond*'s, the decision clearly being to opt for improved sensitivity rather than bass extension.

There's no attempt here to get down much below 50Hz in the bass, but the response through the crossover region is significantly smoother than the smaller model could manage, which may be down to the different driver but also perhaps the more complex crossover that appears to be fitted here.

The overall balance is very good and reasonably smooth with it, especially when located quite close to a wall. The crossover region is well integrated, though the largish dome does tend to focus the mid treble (6-10kHz) somewhat.

Sound Quality

The 410 did no better than should be expected from one of the least expensive models in the test group, which means not very well at all, and in fact rather less well than the *Diamond IV* last time.

The problems seem to lie in the bass end, where the sound is slow, congested and lacking in rhythmic grip, with a tendency to congestion as things get busy. Weight is a little lacking but the balance is fine, with a clear, detailed and pleasantly laid back presentation which is in no way offensive. But the whole affair seems rather lifeless, listless and bland, altogether disinterested in bringing the listener into the music.

Conclusion

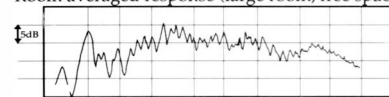
Simply on sound quality grounds the 410 seems to suffer by comparison to its smaller, cheaper and considerably more famous *Diamond IV* stablemate, though quite why this should be the case is not at all clear, since the measured performance looks smoother, and sensitivity is up a worthwhile amount. Perhaps it has lost some of the simplicity that helps the *Diamond* along.

The 410 is not in itself a bad loudspeaker, but neither does it seem to be a particularly distinguished one either, the generally smooth balance and increased loudness capability being insufficient compensation for the blandness and bass inadequacies.

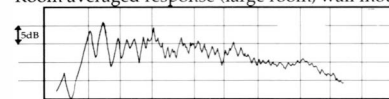
TEST RESULTS

Size (hwxwd)	34.5x22x22.5cm
Weight	5.5kg
Recommended amplifier power	10-80W
Recommended placement	stands close to wall
In room averaged response limits 50Hz-10kHz	+/-5dB
Large room/space LF rolloff (-6dB ref midband)	48Hz
Large room/wall LF rolloff (-6dB ref midband)	45Hz
Large room output at 20Hz (ref midband)	below -20dB
Estimated midrange sensitivity (ref 2.83V, 1m)	89dB
Impedance characteristic (ease of drive)	fairly good
Typical price per pair (inc VAT)	£130

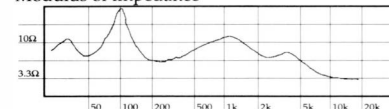
Room averaged response (large room, free space)



Room averaged response (large room, wall mount)



Modulus of impedance



Conclusions Best Buys and Recommendations

Paul Messenger sums up the general and the particular findings of this latest loudspeaker review project.

The more you know, the less you understand' is an aphorism that could have been coined with loudspeakers in mind. One might expect that the task of assessing them would get progressively easier, and results more consistent as experience grows. But every time I tackle one of these projects, and think I'm getting a good fix on the various different models, some unexpected new variable comes crawling out of the woodwork and punctures my complacency.

The dilemma that faces the loudspeaker reviewer is whether one should assess all models against some arbitrary and absolute set of criteria, or take a more flexible approach that attempts to wrestle the best out of each model.

Both approaches can be attacked and defended until long after the cows have come home; in reality I believe a bit of both is required. The strength of the *Choice* methodology is that it automatically imposes an arbitrary, fixed framework, by setting measurement and listening test programmes which permit little variation in assessing different models.

At the same time, the randomly selected group of twenty five models under test generates its own averages and sets deviation standards which invariably closely reflect the market as a whole.

But the episode outlined in the Heybrook review, and similarly ego-deflating experiences when moving Celestion *SL6Si* and Meridian *Argent A2* from steel to Slate Audio stands, make it quite clear that a fixed framework can also be an inflexible dictator, with judgements that may be both arbitrary and fickle.

No intelligent reviewer can claim to avoid these pitfalls on every occasion, but

by increasing the time spent on and importance given to hands-on listening, there's a good chance of keeping them to a minimum.

The counter argument is that extra hands-on listening inevitably imposes more of my own opinion (preferences, prejudices etc.) upon the overall subjective findings, which is indisputable. However, the same blind panel testing is retained, providing the prime framework of subjective evaluation, and this hopefully serves to keep me in line! Our *Readers Write* pages are open for your comments.

This particular group of loudspeakers covered a narrower price and size range than is usually the case. None cost more than £1,000, or weighed more than 30kg, yet there were also far fewer budget priced models than usual, only six of the 25 costing less than £200.

Tradition demands that the listing of Best Buys and Recommendeds begins at the cheapest and moves steadily through in ascending price order. As a system it's as good as any, I suppose, but it raises as many difficulties as it solves. The Alphason *Artemis*, Arcam *Delta 2* and B&W *620* all cost close to £300, and in practical terms the last and by far the largest of these is also the cheapest, since it requires only a set of cones, not a proper stand.

Whether or not supports form part of the evaluation equation, it is still fundamentally impossible to compare three speakers of such disparate size. Certainly the B&W offers the best material value, but that doesn't necessarily make it the automatic choice. The Arcam actually suits my own system and preferences much better, while a less ambitious front end with less low frequency resolution could well be best served by the little Alphason,

undoubtedly the prettiest and most discreet of the three.

Size is just as important a criterion as price to the loudspeaker purchaser, and certainly provides good discrimination between the 25 models assembled for this group test. A rough count comes out at four miniatures, four 'bookshelf' models, four 'large bookshelves(ves?)', five 'luxury compacts', three 'miniature floorstanders' and five 'large floorstanders', each group having its own appeal across a wide price span.

Having made a strong case for classifying speakers within specific size categories, there are still other vital factors, such as placement, to take into account. Some rooms will find it difficult to accommodate a speaker that has to be a metre out from the wall, maybe because it all but blocks the doorway. Another might have bookshelving or a bay window that makes wall mounting impractical.

Furthermore, these alternative positions create sounds of quite different 'flavour', so that experienced enthusiasts used to one may find the other almost impossible to accept.

Listing the loudspeakers in ascending order of price may not necessarily make a lot of sense, but neither would size categories (because it leaves out placement and price), or placement (etc etc). So we'll stick with price for the time being, and leave the reader to ignore those which are the wrong size or stand in the wrong place, which will at least help whittle down the selection process from the impossible to the just about manageable.

Best Buys

Four Best Buys. That's twice as many as I've given before. Am I going soft? Or are speakers getting better? I doubt either, but the four

selected all make sense, for various different reasons.

It must be a while since a US loudspeaker earned a Best Buy accolade in a UK market context, but there's no disguising the competitiveness of the £109 **Allison AL100**. Although this near-miniature wall-mount lacks the subtlety and refinement of the best British rivals, and has rather more than its fair share of coloration and untidiness, it's bigger than many, is solidly enough built and packs a lot of sonic punch for the price.

There hasn't been a Best Buy at around £180 since the Wharfedale *505.2* was reviewed more than two years ago, so the smaller, nimbler **Heybrook Point 5 Series 2** helps fill an important gap in the market. It's a lively little thing, tucks neatly back against the wall, and sounds a bit brash and untidy with multistrand cables, but really comes together with sweetness and midband coherence when solid core leads are used. Certainly an improvement over Heybrook's less expensive *Solo*, all you need to do is become convinced you like the solid core route (he adds sceptically).

Best Buy ratings are truly rare at £300, but both these are thoroughly well deserved, though the loudspeakers responsible couldn't present a greater contrast. The **B&W 620** is about as big a serious loudspeaker as you'll find at the price, floorstanding and needing plenty of space around it. Yet the voicing has been carried out with great care and subtlety, so that it manages to avoid many of the pitfalls that await the large econobox. It doesn't have the upfront clarity and speed of smaller rivals to be sure, but its snoozing-by-the-fireside comfortable sound is its own form of palliative after a hard day's graft.



Robin Marshall's new **Epos ES11** is one of the most impressive newcomers in a long while. Unusual in that the main driver is an integral part of the moulded front panel, this attractive looking luxury compact needs a good partnering stand and a little wall assistance. The sound is a triumph of the art of compromise, combining good speed with delicate transparency and precisely focused imaging, though it's a little lacking in weight and scale.

Recommended models

Least expensive of this edition's recommendations, the £200 **Royd A14 II** is larger than most at the price. Not the prettiest of speakers around, the sound is nevertheless engaging and lively, if a little untidy with it, with a good sense of scale and a loudness capability that reflects the decent enclosure volume. Working best about 30cm away from a wall, it's very transparent to the quality of the drive signal, so needs good quality stands and careful set-up and system tuning.

The £300 **Monitor Audio Monitor 11** perhaps belongs amongst the luxury com-

Boxing clever: which loudspeakers made the grade this month?

pacts, though it looks rather larger and has an extra driver to help out in the bass. The consequence is a little less precision, control and transparency than the best at the price, but the *11* remains a thoroughly entertaining and involving experience, delivering nice out-of-box stereo when stand-mounted well clear of room boundaries.

The **Arcam Delta 2** is a stereotype luxury compact, competing head-on with the *Epos ES11*. It's a little forward and coloured in the midband, but the lively, open and informative low frequencies are ample compensation, providing care is taken to place them for maximum evenness - about 30 to 60 cm from room boundaries is likely to work best - and mount them on proper stands such as *Heybrook HBS1s*.

The tiny little **JRT AD1 Micro** looks pricey at £389, but it's beautifully built and finished, and the little enclosure helps provide speed and coherence that's the envy of most larger boxes. The sound has slight aggressive tendencies, but is also very responsive to system set-up, allowing the enthusiast plenty of scope for fine

tuning.

Clearly good material value for money - rather more so than the more famous *DC3000*, which shares the same cabinet - the £499 **Tannoy J95** is capable of unusually powerful and well controlled bass, thanks to its large and exceedingly well engineered floorstanding enclosure, which needs space to work in. The presence and treble is a little laid back and box-bound, but the sound has an impressively meaty quality, going loud and encouraging full use of the generous performance envelope.

Finally, Recommendation goes to the £850 **Dahlquist DQ8**. This large free space floorstander is a bit of a boom box and far from pretty, but uses an out-of-box treble driver to excellent effect, achieving an commensurately out-of-box sound that has very pleasing transparency and spaciousness, plus a good sense of scale.

Although not formally Recommended, three other models nevertheless deserve special mention, simply because of the rather special way they achieve certain goals, even though that

involves certain peculiarities.

The *Celestion's* £399 **SL6Si** manages to combine considerable potential with a certain practical perversity, its somewhat laid back balance coming beautifully to life when its placed on *Slate Audio* stands that cost the price of the speaker itself. Whilst the search for cheaper effective support goes on, it's still worth a serious listen, especially for CD fans.

Meridian's £995 **Argent 2** seems to follow rather similar rules to the *SL6Si*, especially as far as the *Slate* stands are concerned, and to some extent the overall sound too, its higher price justified by an altogether bigger and smoother sound, but marred (hopefully temporarily) by a driver mounting problem.

Most interesting, and consequently, perhaps most disappointing of all is the utterly discreet £798 *Naim IBL*. For one so small this speaker shows an astonishing ability to resolve detail right out to the frequency extremes, whilst maintaining brilliant dynamics across a wide range. But it's flawed by a midrange peak that is made all the more obvious by the clarity elsewhere, and which several listeners found quite impossible to ignore.

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Tech Talk

Paul Messenger explains how the loudspeaker listening and measurement tests were performed, and outlines what the findings reveal about the products.

These days the *Choice* loudspeaker test schedule involves almost continuous appraisal of batches of 20 to 25 models, which are published thrice a year, alongside occasional smaller groups of niche models - miniatures, giants or whatever.

'One-site' testing is the only sane and sensible way of handling the logistics, even though it does leave my home inundated by black vinyl and cardboard for many months of the year.

The main listening room therein is used for the 'blind' panel and subsequent hands-on listening, and also for the test measurements, which does help provide correlation between the two, but which inevitably means said room will exert a major influence on results. Which may not be ideal, but which is probably unavoidable. The room itself is described in detail later.

Listening

The 'blind' tests on this occasion lasted three days with about five listeners, making up around 30 separate presentations of about half an hour each. Split evenly between vinyl and Compact Disc, the programme covers as broad a range of music as possible. Care is taken to try and 'normalise' the relative volume of each loudspeaker, though differences in frequency balance, bass extension and room drive unavoidably get in the way. A highly experienced operator places the loudspeakers carefully and securely.

Choice of ancillary components inevitably influences the type of sound, possibly as much as the room itself, and is one potential source of prejudice I know no way of avoiding. The main drive system comprises Naim amplification, sourced from Linn *Sondek*/Naim *ARO*/*Troika* vinyl disc and Marantz

CD91 two-box CD player all mounted on Mana tables. Grilles are deliberately left on.

Bookshelf models were used on Linn *Kan*, Foundation *Designer*, and Heybrook *HBSI* stands, with Slate Audio brought in for hands-on work. Bi-wiring is adopted where possible, using heavy multi-strand cables (Linn *LK20*) in the blind tests, backed up hands-on by Mission Cyrus solid core and Naim *NACA4* and *NACA5*. Except where specifically instructed otherwise, the speakers are usually auditioned both sited against a rear wall and in free space.

My particular thanks go to Jason Kennedy for all his hard work as operator on the blind listening tests, and also to panellists: Ken Weller (Tannoy), Richard Dunn (NVA), Alan O'Rourke (Ruark), Neil Truckell (Mordaunt-Short), Chris Ransome (Jamo UK), Julian Ashley (KEF), Doug Randall (Marantz, and especially for the loan of his own very tasty CD player), Graham Quinton Jones, Martin Payne and Struan Robertson.

Measurements

Without decrying the value of anechoic work, especially when developing a single product in isolation, there's no doubt that the room averaged measuring technique which Martin Colloms originally introduced has proved by far the most effective predictor of listening test behaviour, and is particularly relevant to group testing.

Although a solitary in-room measurement of any specific loudspeaker is of very little value, a good idea of the subjective balance is obtained by averaging the measurements at a number of points in the listening area. Further, the comparison of a number of loudspeakers enables the effects of the room to be taken into account.

The main change from before has been to focus

exclusively on room measurements and room averaged response (RAR) traces for the published data. The current test programme involves two separate sets of room measurements, in most cases taken with the specific wall and free space sites used in the listening tests; intermediate positions produce more or less intermediate results.

A conventional pen recorder/mike set-up (Neutrik) is used to carry out sequential rapid sinewave sweeps (high pen and paper speeds) for a succession of microphone positions. By the time half a dozen sweeps have been completed on the same piece of graph paper, an obvious 'average' pattern will have emerged that clearly delineates the averaged response in the listening area.

The technique allows examination of wall-mounted or free space siting, with results that show fine subjective correlation.

A perfectly flat straight line is not necessarily the 'target'. Careful comparison with listening findings and established references suggest that ideal balance should be a flat and straight line up to around 5kHz, followed by a gentle high frequency rolloff. Low frequencies are heavily modified by the main room modes - most notably the c10dB boost at 30Hz (or 10dB suckout at 42Hz if you prefer). For the rest, even and smooth variations are better than sharp discontinuities.

The listening room

The speaker and microphone sites parallel the listening tests, giving a measuring distance of three to four metres, the room itself being a sturdily built, sparsely furnished 4.5x5.5m

plus bay.

Sensitivity differences have as much to do with impedance variations as with conversion efficiencies, which is one reason why the impedance has also been plotted and presented. Halve the impedance value and a speaker will suck twice the current and therefore twice the power for the same amplifier volume setting. By adopting 4ohms rather than 8ohms impedance, 'current hungry' designs therefore 'pinch' 3dB of extra sensitivity. Few amplifiers have the capability to deliver this extra 3dB in full, most settling for 1.5 to 2dB, so an apparent sensitivity advantage may well be partly negated in practice.

One consequence of the room-based testing is that the frame of reference that defines low frequency extension is the room as much as the speaker. Tradition defines the low frequency roll-off as the -6dB (sometimes -3dB) point referred to the sensitivity. Such a technique can be applied to room measurements, but the results tend to be strongly modified (even modulated) by the main room modes.

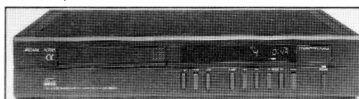
Probably more useful is to specify the relative level of 20Hz ref the midband sensitivity. However, this has the drawback that a good percentage of speakers don't get down to 20Hz, and can't be measured below 30Hz.

Until I can figure out a better approach, I am quoting the -6dB points for both free space and wall mount conditions, plus the 20Hz level. The *Directory* 'bass from' entries for the recent reviews carried out using room measurement techniques therefore refer to the large room/best position -6dB point for the speakers concerned, and cannot be compared directly with earlier 'anechoic' entries, though each has its own internal consistency.

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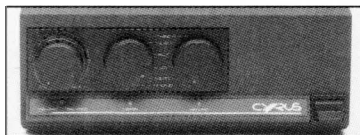
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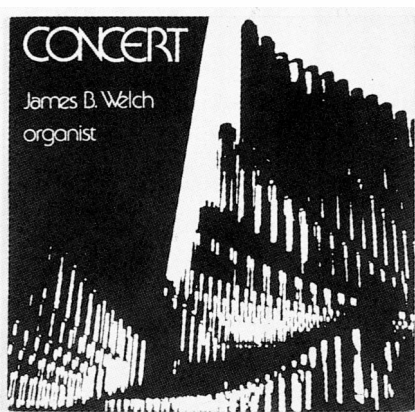
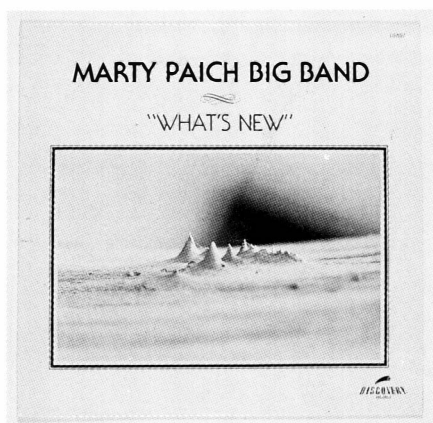
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RR16

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RR23

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Two of the Wilson Audiophile label's famous recordings of classical organ works. On a big system these discs are truly breathtaking — watch out for your woofers!

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Tremendous value: both *Concert* and *Recital* on one compact disc!
W177, W278, WCD177/278

The Choir of Grace Cathedral, San Francisco

Ref CD26 £17.99

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W805, WCD794/805.

Another breathtaking example of Wilson Audiophile's pure analogue recordings, used as reference discs by hi-fi gurus around the world. The discs are hard to find in the UK.

THELMA HOUSTON & PRESSURE COOKER: I've Got the Music In Me

Ref CD27 £18.99

Ref LP27 £16.99

One of Sheffield Labs' most famous recordings. The original direct-cut has been out of print for many years and is now highly collectable — but the recording sessions were of course taped, and this issue will still blow your socks off! Sheffield ST200, CD2. Listed below are further highly collectable Sheffield Labs discs which are astonishing in their sense of realism and truly awesome dynamics:

CLAIR MARLO: Let It Go

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TLP29, CD29

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LAB17, CD17

JIM KELTNER & RON TUTT: The Sheffield Lab Drum Record

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LAB14

The Sheffield Lab Track Record

Ref LP31 £16.99

LAB20

Both the *Track Record* and the *Drum Record* are available on a single CD -

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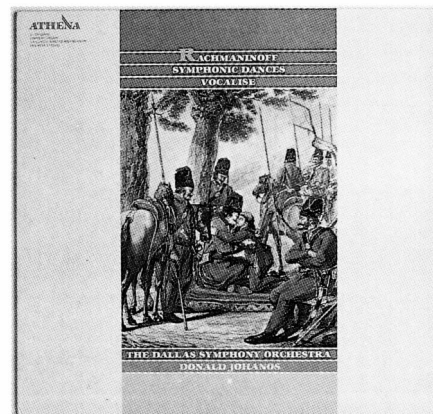
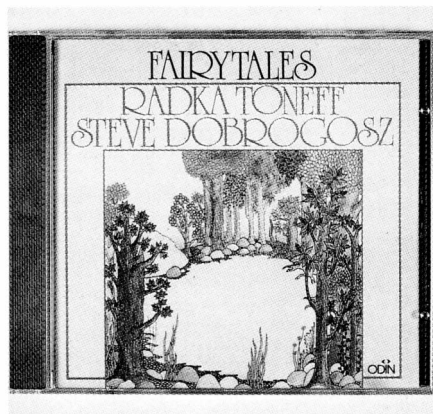
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LAB23, CD23



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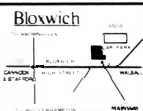
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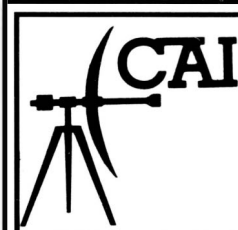


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KENT

HI-FI CENTRE LTD, 65 King Street, Ramsgate. (0843) 590321. A.R., Aiwa, Ariston, Celestion, Goodmans, Kenwood, Marantz, NAD, Radford, Tannoy etc. etc. + guaranteed recon. equip. Dem room + home dems. Hi-Fi repairs & servicing. Trade in & Cred Facs. Mon-Sat (9.30-5.30)

THE HIFI FACTORY, 103 Kirkdale, Sydenham SE26 4QJ. (081) 291 0095. Bose, Tannoy, Mordaunt Short, Cerwin Vega, Celestion, JVC, Kenwood, Philips and many more. Plus cheaper ex-demo systems & separates available. Demonstrations available no appointments necessary. 7 day home trial, installation available, service and repair department. Access, Visa, Instant credit available up to £1000 subject to status. Open 10.30-7.00 Monday-Saturday

JOHN MARLEY HI-FI CENTRES, 2 Station Rd, West Canterbury. (0227) 769329. Also at Dover - (0304) 207562. B&W, Heybrook, Magnum, M.Y.S.T., Nakamichi, Pink Triangle, Rotel, Sansui, Technics, Quad. Dem and home trial fac. Mon-Sat 9-5.30 closed Thurs. Free install. Credit to £1,000. Access, Visa, Credit charge. Service dept.

KIMBERLEY HI-FI, 193 Broadway, Bexleyheath, Kent. (081) 304 3272. Pioneer, Technics, Kenwood, Denon, NAD, Aiwa, Tannoy, Mission, Wharfedale, Castle. Separate dem room, no appointment necessary. Free installation. Service Department. Instant credit facilities. 9.30-5.30. No early closing.

PHOTOGRAPHY HI-FI, 40 High St, Ashford (0233) 624441. No.1 in Kent for Linn, Naim, Rega, Roksan, Exposure, Onix, Epos, Royd, Creek. But before you choose equipment choose where to buy it. Dem room, appts necessary. Home trial and free installation. Visa, Access, Bada Chargecard. 9-5.30 Mon-Fri (Wed & Sat to 5 only), Service Dept.

PROGRESSIVE AUDIO, Rainham, Kent. (0634) 389004. Alphason, Audio Innovation, Conrad Johnson, Proac, Raymond Lumley, Rock Reference, Snell, TDL, Voyd and others. Dem by appt., please phone. Home trial. Free installation. Access, Visa.

STANDENS, 92a High Street, Tonbridge, Kent TN9 1AP. (0732) 353540 Pink Triangle, Kelvin Labs, TDL, Ruark, Marantz, Quad, Musical Fidelity, Micromega, NAD, Arcam, 2 Demo rooms. Home trials. Free installation and Service dept. Access & Visa. HP terms and Bada credit charge. 9.00-5.30 Mon-Sat except Wed 9.00-1.00.

TONBRIDGE HI-FI, 96 Woodlands Road, Gillingham, Kent. (0634) 52858. Linn, Naim, Rega, Pink Triangle, Exposure, Creek, JRT, Sony, Ruark, KEF, Arcam etc. If your interest is music pay us a visit & find out what we do. TONBRIDGE HI-FI, 31 High Street, Tunbridge Wells, Kent. (0892) 24677. Linn, Naim, Rega, Pink Triangle, Exposure, Creek, JRT, Sony, Ruark, KEF, Arcam etc. If your interest is music pay us a visit and find out what we do

VOLUME 1, 41 Upper Wickham Lane, Weelings, DA16 3AD. 081 304 4622. Arcam, Creek, Dual, Epos, Exposure, Mordaunt Short, Monitor Audio, Nakamichi, Pink Triangle, Rotel, Royd, Ruark. Large demo room, no appt nec, darts & snooker facilities. Evening dems in shop by appt. Home trial & demonstration, free delivery & installation. Access & Visa, credit up to £1000. 9.30-5.30 Mon-Sat.

V J HI-FI, 29 Guildhall St, Folkestone. (0303) 56860. Mon-Sat 9-6. NAD, Yamaha, Marantz, Cambridge Audio, Denon, Kenwood, Rogers, Dual, Musical Fidelity, Quad, Dem and home trial facilities, free install, credit to £1000. Amex, Diners, Visa, Access. Service dept.

V J HI-FI, 119 High Street Margate. (0843) 226977. Mon-Sat 9-6. NAD, Yamaha, Marantz, Cambridge Audio, Denon, Kenwood, Rogers, Dual, Musical Fidelity, Pioneer. Dem and home trial facilities, free installation, credit to £1000. Amex, Diners, Visa, Access. Service dept.

LANCASHIRE

MONITOR SOUND, 54 Chapel St, Chorley. (02527) 71935. A&R, Denon, Dual, Pioneer, Quad, Rogers, Rotel, Spondor, Technics, Thorens, Wharfedale, Yamaha, etc. 2 dem rooms. Open Mon-Sat, closed Weds. Free installation. Credit to £1000. Access, Visa. Service dept.

NORMAN AUDIO, 131 Friargate, Preston PR1 2EE. (0772) 53057. Fax 562731. Sony Hi-Fi News Area Winner. Aiwa, B&W Loudspeakers, Denon, Marantz, Mission, Cyrus, Monitor Audio, Nakamichi, Quad, Roksan, Rotel & many others! 2lux. dem. Inge. Home trial by arrangement. Free install. Service dept. Inst. cred. facs. with several companies. Most credit cards accepted. 6 days 9-5.30.

LEICESTERSHIRE

ALPHA AUDIO, 1-3 Guildhall Lane, Leicester LE1 5FQ. (0533) 530 330. Allison, AR, Denon, Luxman, Proton, Revox, Teac, Thorens, plus lots more. 3 dem rooms. Jovial, friendly, crazy staff. Relaxed atmosphere. Home trial facilities, free installation, service dept on premises. Credit facilities (sort of interest free). 10-5, closed Thurs afternoons (sometimes).

MJS HI-FI, 80 Stapleton Lane, Barwell, Leicester LE9 8HE. (0455) 46977. The Rock, Audio Innovations, Kelvin Labs, Snell, Heliuss, Suggden, Ruark, Concordant, Valdi, JPW. Dem and home trial facilities. Mon-Sat 9.30-7.00. Free installation and service dept. Visa, Access.

THE LEICESTER HI-FI CO, 6 Silver Walk, St. Martins Square, Leicester LE1 5EW. Tel: (0533) 539753. Fax: (0533) 626097. Arcam, Creek, Marantz, Mission/Cyrus, Musical Fidelity, Nakamichi, QED HI-FI, Quad, Rogers, Roksan, "and oodles more". 2 dem rooms, home trial arranged, free installation, service department. Credit facilities. Access, Visa, Diners, Amex. 6 days 9.30-5.30. Leicestershire's only Bada member

SOUNDS AROUND, 146A Clarendon Park Road, Leicester LE2 3AE (0533) 702442. (Specialists in used Hi-Fi), A.R. Celestion, TEAC, Mordaunt Short, Tannoy, Marantz, Wharfedale, Philips. No appts necessary, free installation. Service department. Access, Visa. Tue-Sat 10-5.

LINCOLNSHIRE

BOSTON HI FI CENTRE, 65a Wide Bargate, John Adams Way, Boston, Lincs PE21 6SG. (0205) 365477. Quad, Nakamichi, Creek, Ariston, NAD, Denon, Marantz, Castle, Rotel, JPW, Rogers. Separate demo studio. Home trial. Free installation. Service department. Access, Visa, Hi-Fi Markets Chargecard. Tues-Sat 9-5.30pm.

LONDON

ANALOG AUDIO, 849 High Road, London N12. (081) 445 3267. Denon, Dual, JBL, NAD, Marantz, Rotel, Wharfedale, Cerwin Vega, Teac, Mordaunt Short. Free install. Service dept. Instant credit up to £1000. Visa & Access 9.30-6 6 days.

AUDIO ACOUSTIC, West Ealing, (081) 998 9041. Audio Dimensions, Audio Innovations, Audion, Audio Note, ATC, D.C.M., Glastonbury, Goldring, Heliuss, Infinity & Modulas, JPW, Lynwood, Mana Acoustics, Marantz/Audiophile, Mitchell, Nova, Ongaku, Oracle, OriginLive, Ortophon MC3000II + MC5000 + T3000, Pirates, Rata, Revox, Rotel, Rose Industries, Rock Reference, Snell, Supra, Systemdek, Target, Triangle Products, Valdi, Vecture, Voyd & Reference Voyd. Home demos. Free install. Single Spker Demo. Free System Design. Free knowledgeable service. Access, Visa 9.30-6pm. Till late Mon-Sat. Demo by appt. please.

AUDIO CHOICES, 66 High Road, Leytonstone, Stratford E15. (081) 534 6987. Marantz, A&R, Musical Fidelity, SD Acoustics, Rotel, Audio Technica, Ruark, Roksan, Moth, Nakamichi, B&W, Van den Hul, Dual, Pink Triangle, Alison Acoustics. Dem room, home dems within M25 area. 10.30-7.30

AUDIO VENUE, 24 Church Road, Crystal Palace, London SE19 2ET. (081) 771 7787. Linn, Naim, Nakamichi, Marantz, Dual. Credit available. 2 yr. warranty. 2 demo rooms. Closed Weds.

BILLY VEE SOUND SYSTEMS, 248 Lee High Road, London SE13. (081) 318 5755. Linn, Rega, Naim, Nakamichi, Quad, etc. 2 dem rooms. Int. free credit. Access, Visa. Closed Thurs.

CORNFLAKE SHOP, 37 Windmill Street (just off Tottenham Court Road), London W1. (071) 631 0472. Mon-Sat 10-7. Rega, Roksan, Naim, Monitor Audio, Koetsu, Marantz, Yamaha, SME, DNM, Epos, Three dem rooms. Delivery and installation service. Credit facilities. Access, Visa. DOUG BRADY HI-FI, 14-18 Monmouth St. London WC2H 9HB. (071) 379 4010. Wide range of top specialist hi-fi from Britain, America and Japan. 3 dem rooms.

GRAHAM'S HI-FI, Canonbury Yard, 190a New North Rd, London N1 7BS. (071) 226 5500. Winner Sony/HFN Greater London Dealer Award 1986-1989-1990. Linn, Naim, Rega, etc. £400-£3000-£13,000.

THE HI-FI FACTORY, 103 Kirkdale, Sydenham, SE26 4QJ. 081 291 0095. Bose, Tannoy, Mordaunt Short, Cerwin Vega, Celestion, JVC, Kenwood, Philips and many more plus cheaper ex demo systems & separates available. Demos available. No appts nec, 7 day exchange home trial, installation available, service & repair dept. Access, Visa, instant credit available up to £1000 subject to status. 10.30-7pm Mon-Sat

JUST MUSIC, 52 Upper Tooting Road, London SW17 7PB. (081) 767 1233. Aiwa, Dual, Denon, Marantz, Quad, Rogers, Thorens, Musical Fidelity, Suggden, Heybrook and many more. Dem facilities. Appts can be arranged. Home trial. Free installation available. Access, Visa, Amex, Hi-Fi Markets Chargecard, Creditcharge, finance arranged. 10am-7pm Mon-Thurs, 10-6 Fri & Sat.

KAMLA ELECTRONICS, 251 Tottenham Court Road, London W1. (071) 323 2747. Amadens, Ariston, B.L.Q. Gale, Incatech, JPW, Linn, Mordaunt Short, SME, Systemdek, Thorens, Townshend, Ruark, Wharfedale

KJ WEST ONE, 26 New Cavendish St, London W1M 7LH. (071) 486 8262/63. Fax (071) 487 3452. Arcam, Audio Research, Acoustic Research, Apogee, Arcam, Audiolab, Creek, Epos, Linn, Meridian, Musical Fidelity, Pink Triangle. Appts nec. Home trial. Free installation. Service dept. Major credit cards. Mon-Sat 10-6pm. (Late night Thursday til 7pm)

SOUND ORGANISATION LONDON, 1 Cathedral Street, London SE1 9DE. (071) 403 2255/3088. Linn, Rega, Roksan, Micromega, Radford, Rotel, Nakamichi, Onix, Creek, Naim, Exposure, Royd, Heybrook, Epos. Interesting new equipment always under evaluation. Single speaker listening room. Credit facilities. Appts. preferred, free install. Service dept. Open Tues-Sat 10-6. Late dem. by appt.

SOUND SENSE, 350 Edgeware Road, London W2 1DX. (071) 402 2100. Alphason, B&W, Nakamichi, Celestion, Cambridge Audio, Dual, Denon, Monitor Audio, Marantz, NVA, Sony ES. Appointments preferred. Installations available. Access, Visa, Standard credit facilities. Mon-Sat 9.30-6.30

SOUTH LONDON HI-FI & VIDEO, 210 Brixton Hill, Streatham SW2. (081) 674 4433/2033. Denon, Rotel, Yamaha, Kenwood, Tannoy, B&W, INakamichi, Dual, Thorens, Technics, Monitor Audio, Single speaker demo room. Appts. not nec. Installation available. Service Dept. Access, Visa, Amex. Interest Free & Standard credit. 9-6, 6 days

STUDIO 99, 79-81 Fairfax Road, London NW6. (071) 624 8855. Linn, Naim, Meridian, Rega, Quad, Nakamichi, Mission/Cyrus, KEF, Bang & Olufsen, Yamaha, Creek etc. 2 single speaker dem rooms. Appts. nec. Home trials, free install. Service dept. Visa/c, Access/c & finance terms. 10-7 (Mon-Fri), 10-6 (Sat)

TIME AND TUNE, 218/220 Whitechapel Road, London E1 1BJ. (071) 247 0567/8/9. Akai, Aiwa, Bose, Hitachi, Kenwood, Mitsubishi, Panasonic, Philips, Pioneer, Sony, Technics. Home trial facilities. Free installation. Service dept. Instant HP. 9.30am-6pm Mon-Fri, 9.30am-2pm Sun, Sat Closed.

GREATER MANCHESTER

THE AUDIO COUNSEL, 12 Shaw Road, Oldham, Manchester OL1 3LQ. (061) 633 2602. Linn, Naim, Rega, Rotel, Arcam, Micromega, EPOS, Creek, Nakamichi, Denon. 2 dem rooms. Free install. Visa, Access, Licenced credit brokers up to £1000 instant credit. 10.00-5.30 Tues, Weds, Sat. 10.00-7.30 Thurs, Fri. Closed Mon.

CHRIS BROOKS AUDIO, 10-12 Oak Street, Hazel Grove, Stockport SK7 4EJ. (061) 419 9050. Tues-Sat 10-6, 2 dem rooms, credit facilities. All credit cards. Just like the Warrington shop - total absence of bull****.

MURRAY HI-FI, 19 Middle Hillgate, SStockport. (061) 429 7666. Linn, Naim, Rega, Arcam, Yamaha, Royd, Epos, Creek, Nakamichi, Rotel. Full demo facilities, free installation & delivery, service dept. Full 2yr guarantee on all products. Access, Visa, Lombard Tricity, licensed credit broker. 10-6 Tue-Sat.

SWIFT HIFI DELITY, 12 Chapel Street, Cheadle. (061) 428 7222. Arcam, Denon, Kenwood, Marantz, Nad, Cyrus, Rotel, Pioneer, Mission, Tannoy. Demo room. 9.30-6. Closed Wed.

MIDDLESEX

HARROW AUDIO, 27 Springfield Rd, Harrow. (081) 863 0938. Mon-Sat 9.30-5.30. A&R, Audiolab, Cyrus, Denon, Dual, Heybrook, Linn, Monitor Audio, Musical Fidelity, Quad, Rotel, Tannoy etc

The Choice Dealer Directory

BRITISH AUDIO DEALERS ASSOCIATION



NORTHWOOD AUDIO, 126 Pinner Road, Northwood, Middlesex HA6 1BP. (0927) 420877. Exposure, Musical Fidelity, Pink Triangle, Manticores, Audio Innovations, Rotel, Ruark, SD Acoustics, Moth. Dem room. Home trial. Free install. Access. Visa. 9-6 Mon-Sat.

RIVERSIDE HI-FI LTD, 422 Richmond Road, East Twickenham, Middlesex TW1 2EB. Tel. (081) 892 7613. Fax (081) 892 7749. A.R., Arcam, Audio Innovations, Castle, Dual, Denon, KEF, Luxman, Nichell, Musical Fidelity, Micromega, Marantz, Nakamichi, Rotel, Spenhdor, Systemdek, Tannoy, Yamaha. One demo room, in-car demo for car hi-fi systems. Appts not always necessary. Home trial facilities. Free installation. Service dept. Lombard Trinity, Access. Visa, Amex, Diners Club. Mon-Sat 9.30-6, Thurs, Fri 9.30-7.

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

MERSEYSIDE

BETTER HI-FI, 16 Cook St, Liverpool L2 9RF. (051) 227 5007. Linn, Naim, Quad, Arcam, Audio Innovations, Threshold, Creek, Denon, Yamaha, Mordaunt Short. 3 dem rooms. Home trial. Free install. Service Dept. Access. Visa. Instant credit up to £1000. 0% on certain items. 9-5 Mon-Sat.

W.A. BRADY & SON, 401 Smithdown Rd, Liverpool L15 3JJ. (051) 733 6859. Largest choice of specialist Hi-Fi in N.W. £100-£20K+. All credit cards. 3 dem rooms. Closed Monday. **BADA**

IN CONCERT HI-FI, 144 Seaview Road, Wallasey, Wirral, Merseyside. (051) 630 5055. Denon, Kenwood, QED, G-Alexander, Spica, Shan Acoustics, Systemdek, Musical Fidelity, Audio Dimensions, Voyd. Single speaker dem. room. Home trial, free installation. 10-6 - closed Mon. Access, Visa

NORFOLK

BASICALLY SOUND, The Old School, School Rd, Bracon Ash, Norwich NR14 8HE. (0508) 70829. Arcam, Linn, Naim, Denon, Spendor, Exposure, Audio Technica, Creek, Rega, Epos, etc. 2 comprehensive dem rooms. Home trial. Free installation. Visa, Access, HP facilities. Tues-Sat 9.30-1, 2-5.30.

MARTINS HI-FI, 5 High Street, Kings Lynn. (0553) 761683. Established 1968. **BADA**

MARTINS HI-FI, 85/91 Ber Street, Norwich. (0603) 627010. Established 1968. **BADA**

SOUND APPROACH, 161 aUnithank Road, Norwich. (0603) 622833. Kuzma, Ariston, Castle, Denon, Exposure, Ion, Royd, NVA, Roksan, Ruark, etc. etc. Dem and home trial facilities. Mon-Sat 9-6.30. Free installation. Credit to £1,500. Visa, Access, Diners Club. Service dept.

NORTHAMPTONSHIRE

CLASSIC HI-FI + VIDEO, School Lane, Kettering, Northants. (0536) 515766. Rotel, Musical Fidelity, Wharfedale, Monitor Audio, Yamaha, JBL, Dual, Marantz, Kenwood, Kef, Celestion, and many more. Home trial, free instal., service dept. Access, Visa, credit facs. 9.30-5.30pm.

CLASSICAL SOUNDS, 84E Watling St East, Towcaster, NN12 7BS. Tel 0327 359588, call for details.

THE AUDIO SHOP, Coffee Tavern Court, High St, Rushden. (0933) 56651. Denon, Goldring, Ariston, Tannoy, Royd, Mordaunt Short, JPW, Ion Systems, Rotel, Creek. Dem room. Home trial and free installation. Mon-Sat 9.30-5.30 (Thurs 9.30-2). Service dept.

NOTTINGHAMSHIRE

CHANTRY AUDIO, Chantry Walk, 18a Eldon Street, Tuxford, Newark, Notts NG22 0LH. (0777) 870372. Pink Triangle, Royd, JPW, Rotel, S.D. Acoustics, NVA, Nichell, Art Audio (valve), Kelvin Labs, Sumo and much more. 2 dem rooms, appts preferred. Home trial, free installation. Access, Visa & credit facilities and mail order. Mon-Fri 10am-4.30pm. Sat 9.30-5.30. Sun home dem by appt. Closed Weds.

DEFINITIVE AUDIO, (0602) 813562. Voyd, Audio Innovations, Snell, Helius, Systemdek, Revox, Deltac, JPW, Pirate, Loewe Audio Visual plus more. Home dems through Notts and E. Mids. Free install. 10-7, 7 days. Tel. (0602) 813562 for further info appt

WEST MIDLANDS

AUDIO CENTRE MAINWAY, Sharing Asda Car Park, High Street, Bloxwich, Walsall, W. Midlands. (0922) 473499, 493499. Meridian, Kef Reference, Arcam, Rogers, Musical Fidelity, TDL, System Dek, Moth, QED Elect, Ariston, Linn, Audio Technica, JPW, Van den Hul etc. The Midlands most exclusive Hi-Fi Centre with private listening studio. Open evenings by appointment Home trial. Free install. Own service department. Inst. credit. Chargecard. Interest free. Access, Barclaycard. Mon-Sat 9-5.30. BRIDGE HI-FI, 3 Tudor House, Bridge St, Walsall (0922) 640456. NAD, Dual, Yamaha, Kenwood, Technics, Pioneer, Mission, Celestion, Denon, Mordaunt Short. Appts required. Home trial & free install. Access, Visa, Diners, Amex. Credit to £1,000. 9.15-5.30 Mon-Sat. Service dept.

FRANK HARVEY HI-FI EXCELLENCE, 163 Medieval Spon Street, Coventry. (0203) 525200. All major agencies. Free inst. Service dept. Partex. 3 dem rooms. Mon-Sat 9.30-5.30. Wed til 8pm **BADA**

GRIFFIN AUDIO LTD, 94 Bristol Street, Birmingham. (021) 692 1359/ (021) 622 2230. Castle, Creek, Cyrus, Denon, Linn, Marantz, Naim, Quad, Rega, Rotel. Tues-Sat 10-6 **BADA**

HORNTON ELECTRONICS (1987) LTD, 8-9 Lower Temple St, Birmingham B2 4JD. (021) 643 0972. Aiwa, Acoustic Research, Denon, Marantz, Mordaunt Short, JVC, Mission, Sony, Technics, Wharfedale. Credit to £1000. Access, Visa. 9-5.30 Mon-Sat. Service dept. **MUSICAL APPROACH**, 37 High Street, Aldridge, Walsall, W. Mids. (0922) 57926. Linn products, Arcam, Creek, NVA, Revolver, Onix, Epos, Marantz, Rotel, Quad & more. Dem facs. Home trial. Service dept. Credit facs available. Access, Visa. 9.30-5.30 Mon-Sat. 9.30-1 on Thurs

NAAM HI-FI VISION, 122-123 New Street, Birmingham. (021) 633 4944. Pioneer, Akai, Aiwa, Panasonic, Toshiba, Hitachi, Bose, Wharfedale, Sony. Demo facilities available, appointments preferred. Access, Visa, 10 month interest free credit. Amex, Loombarid Trinity Creditcharge. Mon-Sat 9-6.00. SUPERFI, 67 Smallbrook, Queensway, Birmingham B5 4HZ. (021) 631 2675. Specialist Hi-Fi stockists of: Audio Lab, Musical Fidelity, Quad, Pioneer, Yamaha, Rotel, Wharfedale, Tannoy, Celestion and many more. Single spkr rooms by appt. **BADA**

OXFORDSHIRE

ASTLEY AUDIO LTD, 3 Market Place, Wallingford. (0491) 39305/34349. Technics, Panasonic, Pioneer, Kenwood, Sony, Yamaha, Denon, Dual, Mission, Tannoy, Home trial, free installation. Service dept. Access, Visa, Amex, Diners. Instant credit. Tue-Fri 9-5.30, Sat 9-5. Records & CDs stocked

OXFORD AUDIO CONSULTANTS LTD, Cantay Hse, Park End Place, Oxford OX1 1JE. (0865) 790879. Oxford Acoustics, Audio Research, Krell, Magneplanar, Apogee, Aragon, Stax, Marantz, Wharfedale, Cambridge Audio. Home trial and free installation. Instant credit, Access, Amex, Visa. 10-6 Tues-Sat. Service dept.

WITNEY AUDIO VISUAL, 28 High St, Witney, Oxford. (0993) 702414. Aiwa, Akai, AR, Bose, B&W, Cambridge, Dual, Mordaunt-Short, NAD, Onkyo, Pioneer, Roberts, Sony & Sony ES, Tannoy, Wharfedale, Yamaha, Reference Point Dealer. Dem facilities. Mon-Sat 9-5.30. Free installation, credit to £1,000. Access, Visa. Service dept.

SHROPSHIRE

AVON HI-FI, 12 Barker Street, Shrewsbury, Shropshire SY1 1QJ. (0743) 55166. NAD, Quad, B&W, Arcam, Kenwood, Aiwa, Bose, Nakamichi, Revolver, Onkyo. Dem room. Home trial. Free install. Service dept. Access, Visa. £1000 instant credit. Mon, Tues, Wed, Fri, Sat 9-5.30.

CREATIVE AUDIO, 9 Dogpole, Shrewsbury. (0743) 241924. Linn, Naim, Roksan, Mission, Arcam, Rogers, Denon, Marantz, Rotel, Celestion, etc. Dem room. Home trial and free installation. Credit to £1000. Access, Visa. Tues-Sat 9.30-5.30. Service dept.

SOMERSET

PAUL ROBERTS HI-FI, 32 North Str., Taunton. (0823) 270000. For facilities see entry under Avon.

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

STAFFORDSHIRE

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

ACTIVE AUDIO, 95 Stafford Street, Hanley, Stoke on Trent. (0782) 214994. Arcam, Ariston, Celestion, Cyrus, Denon, Kef, Kef Reference, Marantz, Rogers, Rotel, etc. etc. The only BADA Member in Staffordshire. Full dem & home trial facs. Account and credit cards. Ring for opening times and free Fact Pack. **BADA**

GRANGE HI-FI LTD, 153 Branston Road, Burton-on-Trent, Staffordshire DE14 3DQ. (0283) 33655. Audio Innovations, Arcam, Castle, Denon, Pink Triangle, Rotel, Rogers, Systemdek, SME, Quad, Voyd. Demonstrations facilities available, appointments necessary on Saturdays. Free installation. Service department. Access, Visa. 9.00-5.30pm. Closed Wednesday. Closed for lunch 12.00-12.30.

INTERSOUNDS, 62 Bennett Precinct, Longton, Stoke-on-Trent. (0782) 336233. Arcam, Denon, Dual, Mission, Musical Fidelity, NAD, Nakamichi, Revolver, Rotel, Systemdek, etc. G.0008 different speaker manufacturers. 2 dem rooms. Free install. In-house service dept. Access, Visa, £1000 credit subject to status. 9.30-5.30 Mon-Sat. Closed Thurs.

MUSICAL APPROACH, Unit 7, Waddings Yard, Baileys Str., Stafford. (0785) 55154. Linn Products, Arcam, Creek, NVA, Revolver, Audiotec, Onix, Epos, Marantz, Rotel and more. Home trial. Free installation. Service dept. Credit facilities available. Access, Visa. 9.30-5.30 Mon-Sat.

SUFFOLK

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

THE STEREO SHOP, 94 Norwich Road, Ipswich, Suffolk. (0743) 233832. Linn, Exposure, Musical Fidelity, Creek, Epos, Monitor Audio, Mordaunt Short, Marantz, Rotel, Philips, NAD, 2 single speaker listening rooms. Multi rooms specialists. Free installations. Service dept. Plus 3 year guarantee. Access & Visa. Lincensed credit broker. 10.00-6.00 Tue-Sat. Thurs 10.00-8.00 (by appointment).

SURREY

AUDIO INC, 44 Walton Road, East Molesey, Surrey KT8 0DQ. (081) 941 4234. Acoustic Energy, Conrad, Johnson, JA Nichell, Proac, Croft, VPI, Thorens, Pink Triangle, Rotel, Luxman. Single speaker demo room. Home trial facilities. Free installation. Access, Visa. Interest Free Credit on some items, standard credit terms. 10-6 Mon-Sat. 10-8 Thurs. 10-4 Sun.

AUDIO SOUTH, 5 Mead Lane, Farnham, Surrey GU9 7DY. (0293) 619295. Audio Innovations, JPW, Luxman, Marantz, Ortofon, Rotel, Snell, Sugden, Teac, Voyd. Dem room and evening appointments available. Home trial facilities. Free installation. Access, Visa. 10.30-6.00 Mon-Sat. Closed Tuesdays. DATASOUND, 23 South Street, Dorking, Surrey RH4 2JZ. (0306) 862897. Arcam, Celestion, Denon, Dual, Marantz, Mission, Musical Fidelity, NAD, Rotel, Tannoy. Dedicated listening room. Free install. Service dept. Up to £1000 instant credit subject to status. 9.30-5.30 6 days

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

RIVERSIDE HI-FI, 422 Richmond Road, East Twickenham, TW1 2EB. Tel: (081) 892 7613. Fax: (081) 892 7749. See main entry under Middlesex. ROGERS HI-FI, 13 Bridge Street, Guildford, Surrey. (0483) 61049. Aiwa, Denon, Dual, JPW, Marantz, Monitor Audio, Philips, Pioneer, Systemdek, Tannoy. Demonstration facilities available, no appointment necessary. Free installation. Service department. Access/Visa. Instant credit up to £1,000 subject to status. Monday-Saturday 9.30-6pm, later by appointment.

SOUNDS EXCLUSIVE, 1 Kent House, High Street, Cranleigh, Surrey GU6 8AU. (0483) 268185. Marantz, Sumo, QED, Nichell, Alphason, SME, Ortofon, Finestra, Proac, Bose. Home trial. Dems a pleasure. Appts preferred. Service dept. Free install. Access, Barclaycard. **BADA**

SPALDINGS HI-FI, 352-4 Lower Addiscombe Rd, Croydon, Surrey. (081) 654 1231. 3 dem rooms and home dem. Free installation, credit. Mon-Sat 9-6. Tues to 8. Closed Wed. Service dept. **BADA**

SURBITON PARK RADIO, 48 Surbiton Rd, Kingston-Upon-Thames, Surrey (081) 546 5549. Quad, Dual, Denon, Kenwood, Nakamichi, K. Rotel, Pioneer, QED, B&W, Tannoy. Dem and home trial facilities. Access, Visa. 9.30-5.00 Tues-Sat. Service dept.

SURREY HI-FI, 45 High Street, Godstone, Surrey RH9 8LS. (0883) 744755. Parking, easy access - just 2 mins off junction 6, M25. Marantz, Musical Fidelity, QED, Radford, Tannoy, TDL, Kelvin Labs, Gyrodec, Reference Imports, Acoustai. Single speaker demo room. Appts not necessary, home trial facilities, free installation, service dept. Access, Visa, Mastercard. 9-6 6 days a week.

TRU-FI SOUND AND VISION, 2 Central Parade, Redhill, Surrey. (0737) 767404/766128. Aiwa, Audio Technica, B&W, Nakamichi, Mission, Mordaunt-Short, Nakoaka, Sony, Technics. Dem. facilities. Free installation. Service dept. 0% finance. Access, Visa. Mon-Sat 9.30-6

TRU-FI SOUND & VISION, 10 Church Street, Leatherhead, Surrey. (0372) 378780. Sony, Technics, Panasonic, Mitsubishi, Ferguson, Aiwa, Pioneer, Sanyo, B&W, Mission. Free installation. Credit facilities. Access, Visa. 9.15-5.30 Mon-Sat. Closed Wed. Service dept. UNILET HI-FI, 35 High Street, New Malden, Surrey KT3 4BY. (081) 942 9567. Kef, Mission, Musical Fidelity, NAD, Nakamichi, Quad, Rotel, Tannoy. Dem. Amex, Access, Visa, etc.

SUSSEX (EAST)

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

HASTINGS HI-FI, 33-35 Western Road, St. Leonard's, E. Sussex TN37 6DJ. (0424) 442975. Linn, Musical Fidelity, Quad, Nakamichi, Arcam, Celestion, NAD, Denon, Yamaha, Tannoy, 2 listening rooms. Home trial. Free installation. Service dept. All credit cards welcome. Instant credit up to £1,000, written offers on request. 9-6pm Mon-Sat

JEFFRIES HI-FI, 69 London Road, Brighton, East Sussex. (0273) 609431. 2 dem rooms, closed Mon, late night Wed. Parking, bus route. Credit facilities. **BADA**

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

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

The Choice Dealer Directory

BRITISH AUDIO DEALERS ASSOCIATION

BADA
THE ULTIMATE IN
SOUND ADVICE

THE POWERPLANT, 66 Upper North Street, Brighton BN1 3FL. (0273) 775978. Roksan, Musical Fidelity, Onix, Marantz, Rotel, Yamaha, Bryston, Tannoy, Monitor Audio, JPW, etc. Comfortable single speaker demonstration rooms. No appts. nec. Home trial facilities, free install. Service dept. Credit facilities available on request. Mon-Sat 10-1.00, 2.00-6pm.

SUSSEX (WEST)

CHICHESTER HI FI, 7 St. Pancras, Chichester, W. Sussex PO191SJ. Tel: (0243) 776402. Linn, Naim, Rega, Creek, Nakamichi, A&R, Denon, Roksan etc. Tues-Sat, 10-1, 2-5.15 (closed Mon) **BADA**
MALCOLM AUDIO, 12 South Street, Chichester, W. Sussex. (0243) 787562. Sony, Technics, Denon, Yamaha, Sherwood, Mordaunt Short, Wharfedale, Allison, Dual, NAD. Appointments necessary. Home trial facilities. Free installation. Service Dept. Access, Visa. 9.15-5, Mon-Sat.

TYNE & WEAR

BILL HUTCHINSON LTD. 87A clayton Street, Newcastle-Upon-Tyne. Tel: (091) 2303600. A.R., Aiwa, Denon, Dual, JVC, Mission, Mordaunt Short, Omar, Technics, Yamaha, etc. Demonstration facilities. Free installation, service department. Instant credit, Access, Visa. Mon-Sat 10-6.
RED RADIO SHOP AND HI-FI CENTRE, 11 Olive Street, (Off Park Lane), Sunderland. (091) 567 2087. Castle, Denon, Bose, JVC, Kenwood, Mordaunt Short, Michell, Teac, Tannoy, Shure. Dem room, large with comparator facility. Free install. Service dept. Interest free credit and no deposit interest free credit. 9am-5.30pm daily

WARWICKSHIRE

NAAM HI-FI VISION, 78 Lower Precinct, Coventry CV1 1DX, (0203) 632086. Technics, Pioneer, Kenwood, AR, Akai, Aiwa, Panasonic, Toshiba, Wharfedale, KEF. Demo facilities. Access, Visa, Amex, Lombard Tricity credit charge. 9.00-6.00 Mon-Sat.

WORCESTERSHIRE

WEST MIDLANDS AUDIO, 158 Ombersley Road, Worcester WR3 7HA (0905) 58046. Linn, Naim, Rega, Absolute Sounds, Meridian, Mission, Arcam, Ion Systems, Roksan. 3 dem rooms for budget. High end & Audio Visual appointment necessary. Home trials. Free installation. Service Dept. Access, Visa, Amex. Diners, Lombard/Hitachi. Mon-Fri 9.30-8.30 by appt Sat 9-5.30

YORKSHIRE (NORTH)

SCARBOROUGH HI-FI CENTRE, 53 Dean Road, Scarborough, N. Yorks YO12 7SN. (0723) 374547. Aura, B&W, Mission, Quad, NAD, Oxford, AlphaOne, Rogers, Nakamichi, Ruark, Voyd. Dem room, appointment preferred. Home trial facilities. Free installation. Service department. Access/Visa/Creditcharge/£1,000 instant credit/Amex/Diners. 10-6 Tuesday to Saturday.
HARROGATE HI-FI CENTRE, 15 Commercial Street, Harrogate, N. Yorks HG1 1UB. (0423) 504274. Aura, B&W, Mission, Quad, NAD, Oxford, Alphason, Rogers, Nakamichi, Ruark, Voyd. Dem room, appointment preferred. Home trial facilities. Free installation. Service Department. Access/Visa/Creditcharge/£1,000 instant credit/Amex/Diners. 10-6 Tuesday to Saturday
SOUND ORGANISATION YORK, 16 Gillygate, York YO3 7EQ. Tel: (0904) 627108. Linn, Naim, Rega, Roksan, Sony, Arcam, Mission, Denon, Ion, Rotel. 2 single speaker dem rooms. Appts. preferred. Home trial. Free installation. Service dept. Access, Visa. Instant free credit available. 10am-6pm Tues-Sat. Sony dealer. Award nominated 86, 87, 88.

BADA
TRC HI-FI, 3 Kings Cross Str, Halifax, HX1 2SH. 0422 366832. Full demonstration facilities at any time, no appts nec, free install, service dept Access, Visa, Lombards credit charge available. 9-5.30 Mon-Fri, Closed Thurs, 9-5 Sat 10-4

YORKSHIRE (SOUTH)

HI-FI STUDIOS, Sunnyfields, Doncaster. (0302) 781387. Heybrook, Monitor audio, Art Audio, TDL, Michell, Sugen, Acoustic Energy, Alphason, Teac, Dual. Listening room demos, appointments necessary. Home trial. Free installations. Service available. Access, Visa. 10-8pm 7 days. Phone for further info
MOORGATE ACOUSTICS, 184 Fitzwilliam St, Sheffield. (0742) 756048. Roksan, Linn, Musical Fidelity, Denon, Meridian, Krell, Quad, Audio Research, Exposure, Nakamichi, 2 demo rooms. Free installation. Service Dept. Access, Visa. Credit. 9.30-5.30 Closed Mon. **BADA**
MOORGATE ACOUSTICS, 8 Westgate Chambers, Rotherham. (0709) 370666. Roksan, Linn, Musical Fidelity, Denon, Meridian, Krell, Quad, Audio Research, Exposure, Nakamichi. A multitude of demo rooms. Free installation. Service dept. Access, Visa, credit facilities. 9.30-5.15 Closed Thurs **BADA**

YORKSHIRE (WEST)

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

AUDIO VISION (BRIGHOUSE) LTD, 5 Bethel St, Brighouse, W. Yorks. D6 1JR. 0484 713996. Largest range of Technics hi-fi in Yorkshire, Aiwa separates, Mordaunt-Short and Castle Acoustics Speakers. Panasonic, Finlux & Mitsubishi. Nizam TVs & Hi-Fi VCR's. Excellent CD dems. using comparator facs & over 1000 CD titles. Appts. pref. please phone. Free expert install. In-store Service dept. Visa, Access, Credit charge. Licensed credit broker. Open Mon-Fri 9-6, Sat 9-5.30
ERRICKS, Rawson Square, Bradford, (Near John St Market) (0274) 309266. A&R, Linn, Quad, Exposure, Nakamichi, Mission, Denon, Kenwood

Private demo rooms, no appt nec, home trial facilities, free installation, service dept. Access, Visa, licenced credit broker. Mon-Sat 9-5.30 (Tue 10-5.30) **BADA**

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

IMAGE HI-FI Ltd, 8-10 St Annes Rd, Headingley, Leeds. (0532) 789374. AR, Audio Lab, Denon, Linn, Marantz, Meridian, Mission, Monitor Audio, NAD, Quad. **BADA**

IMAGE HI-FI, 17 The Springs, Wakefield, WF1 1QE. (0924) 200272. AR, Audio Lab, Denon, Linn, Marantz, Meridian, Mission, Monitor Audio, NAD, Quad. **BADA**

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

T.R.C. HI-FI, 3 Kings Cross Str, Halifax. (0422) 366832. Alphason, Castle, Denon, Harmon/Kardon, Kenwood, Quad, Rotel, Technics, Wharfedale. Free installation, Service dept, No Appt nec. 9.00-5.30, closed Thurs.

NORTHERN IRELAND

ARMAGH

LYRIC HI-FI, 84 Bridge Street, Portadown, Armagh, N. Ireland. (0762) 358059. Linn, Naim, Rega, Arcam, Denon, Rotel, Musical Fidelity, Revox, Mission, Akai, Panasonic, etc. Mon-Sat 10am-6pm. **BADA**

BELFAST

LYRIC HI-FI, 163 Stranmills Road, Belfast. (0232) 381 296. Linn, Naim, Rega, Arcam, Denon, Rotel, Musical Fidelity, Revox, Mission etc. Mon-Sat 10-6, Late night Thurs. **BADA**

ZEUS AUDIO, 6 Hope Street, Belfast. (0232) 332522. Audio Innovations, Pink Triangle, Roksan, Marantz, Celestion, Linn, Meridian, Mission Cyrus, Ortolon, etc. Mon-Sat 10.00-5.30, Late night Thurs. **BADA**

COUNTY DOWN

ASTON AUDIO, 17 Hillhead Road, Dundonald, Belfast. 0247 872431. Akai, Technics, JVC, Pioneer, Mitsubishi, Panasonic, Toshiba, Sharp, Sanyo. Demos available. No appts nec, service dept. Please phone for directions. Mon-Fri 2-8, Sat 10-4.

LONDONDERRY

ZEUS AUDIO, 23a Kingsgate Str, Coltraine, BT52 4LB. (0265) 56634. Marantz, Mission Cyrus, Aiwa, Akia, Alphason, Sony, Pink Tri, Celestion, Rotel. Opne Mon-Sat 10-5.30, Closed Thurs. **BADA**

EIRE

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

SCOTLAND

CENTRAL

HI-FI CORNER, 44 Cow Wynd, Falkirk. (0324) 29011. Nakamichi, Denon, TDL, Ruark, Technics, Luxman, Thorens. 9.30-5.30 Mon - Sat Closed Weds. Demo. room available. **BADA**

EDINBURGH

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

HI-HI CORNER, 121b Rose Street Pedestrian Precinct, Rose Str, Edinburgh EH2 3DD. 031 220 1535. Large range of products such as Nakamichi, Arcam, Audio Lan, Quad, Cyrus, Mission, Allison, Proton, NAD, Technics. Mon-Sat, 10-5.30pm, Thurs 10-7.00pm **BADA**

RUSS ANDREWS HI-FI, 34 Northumberland St, Edinburgh. (031) 557 1672. Linn, Naim, Rega, Arcam, Rotel, Marantz, Nakamichi, Quad, MS, MA, Yamaha. Demos. 10-5.30 Mon-Fri, 10-5 Sat. **BADA**

GLASGOW

BILL HUTCHINSON Ltd, 43 Hope Street, Glasgow. (041) 248 2857. A.R., Aiwa, Denon, Dual, JVC, Mission, Mordaunt-Short, Omar, Technics, Yamaha etc. Dem facilities. Mon-Sat 10-6. Free installation, instant credit. Access, Visa. Service dept.

HI-FI CORNER, 52 Gordon Street, Glasgow (041) 248 2840. The best in unbiased sound advice. Open 10-5.30 Tues - Sat. Demo room etc **BADA**

HI-FI EXPERIENCE 145 Bath St, Glasgow. (041) 226 4268. Linn, Meridian, DNM, Celestion, Quad, Mission-Cyrus, Denon, Wharfedale, Ruark. 2 Demo Rooms. Tue-Sat 9.30-5.30. Contact James or Gordon. **BADA**

STEREO STEREO, 278 St. Vincent St. Glasgow G2 5RL. (041) 248 4079. Linn, Naim, Rega, Arcam, Creek, Epos, Exposure, Revox, PT, etc. Mon-Sat 10-6. Interest free credit. **BADA**

GRAMPIAN

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

TAYSIDE

W.M. COUPAR, 33 Reform Street, Dundee, Tayside, (0382) 29588. Bang & Olufsen, NAD, Technics, Denon, Kenwood, Dual, Nakamichi, B&W, Acoustic Research, JBL. No appointment necessary, free installation, service department. All demonstration systems wired through a demonstration comparator. Licensed credit broker, Access, Visa. Monday-Saturday 9.00 am-5.30.

WALES

CLWYD

THE HI-FI ROOM, Apple Sound, Unit 3, Cambrian Business Park, Queens Lane, Mold, CH7 1NJ. (0352) 700433. AR, Aura, Denon (including DAT), DCM, Dual, Harman Kardon, JPW, Ruark, Thorens and more. Single system demos. Appointments nec., Home trial facilities, Free installation, Service dept, Credit facilities. Mon-Sat.

DYFED

LEWIS AUDIO, 2 Queen Street, Carmarthen, Dyfed. (0267) 236463. NAD, Dual, Kenwood, Harmen-Kardon, Rotel, Marantz, Denon, JPW, Wharfedale, JBL. Dem. room. Home trial facilities, free installation, Service dept Access, Visa, Amex, £1000 instant credit. Phone for details. Mon - Sat 9.30-5.15

SOUTH GLAMORGAN

AUDIO EXCELLENCE, 134 Crwys Road, Cardiff. (0222) 228565. Audio Research, Krell, Linn, Naim, NAD, Yamaha, Quad, Arcam, Mission + lots more. Closed Mon. **BADA**

WEST GLAMORGAN

AUDIO EXCELLENCE, 9 High St, Swansea. (0792) 474608. Audio Research, Linn, Arcam, Mission, Quad, Naim, NAD, Yamaha, etc. Closed Mon. **BADA**

GWENT

AUDIO EXCELLENCE, 37 High St, Newport. (0633) 220012. Audio Research, Linn, Naim, NAD, Yamaha, Arcam, Mission, Quad, etc. Closed Mon. **BADA**

NORTH WALES

ACTON GATE AUDIO, 4 Ruabon Road, Wrexham, Clwyd, (0978) 364500. Arcam, Cambridge, Celestion, NAD, Quad, Radford, Rotel. Semilink, Tannoy, Yamaha etc. Dem room, appts. nec. Free install. Service Dept. Access, Visa, Amex. 9-5.30 Mon-Sat. Closed Weds.
ELECTRO TRADER, 19 Colwyn Crescent, Rhos On Sea, Colwyn Bay, Clwyd, (0492) 48932. Ariston, Arcam, B&W, Heco, Infinity, Onkyo, Rotel, Tannoy, TDL, Yamaha etc. Dem room. Appts preferred. Home trial. Free installation. Access, Visa, American Express, Diners. 9.30-1.00, 2.00-5.30 Mon-Sat.

The Directory

TURNABLES & TONEARMS

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

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

Listed separately as integrated players and as turntable motor units and tonearms, our sound quality rating is based on results achieved using a high quality system – but in point of fact the turntable is usually the limiting factor soundwise in any system. Lab performance summarises the speed stability, vibration generation and environmental isolation of turntables, along with the friction, alignment and adjustment of tonearms. The tonearm's physical characteristics also define a range of compatible cartridges.

INTEGRATED TURNABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	ISSUE
Acoustic Research EB-101 £230	Good Good	This genuine high fidelity product offers an impressive package at a competitive price	Subchassis, manual, 13.5g	BB	48
Alphason Solo/Xenon MCS £440/£320	Average Good	The deck is warm and euphonious with high levels of clarity. Wow artefacts occasionally just audible	Suspended motor unit, optional quartz PSU, 13g		67
Alphason Sonata/HR-100S MCS/Atlas £760/£500/£360	Very Good Very Good	Good sound in all areas - bass, clarity and neutrality all in the top class and bettered by very few decks. Atlas PSU expensive but worthwhile	Belt drive, suspended, optional PSU, 13g	R	79
Alphason Super Nova £300	Good Good	Informative, easy to listen to and quite lively deck with good detail and occasionally uneven bass. Build quality of review sample not perfect	Subchassis, manual, belt drive, detachable arm. 12g	R	91
Ariston Forte £350	Average - Average	Heavy on engineering, short of soul? The Forte almost makes it, losing out only because of some residual pitch variations and a lack of bass power. The arm is modestly good	Manual 2-speed belt drive player and detachable arm, 10g		67
Ariston Icon £215	Good Good	A thoughtful and efficient design that offers good sound, excellent value and semi-automatic operation tool. Good vibration isolation eases siting	Belt drive, suspended, semi-automatic, 10g	BB	79
Ariston Pro £180	Good Good	Remarkably clear and detailed for the price, very neutral. Benefits from cartridge upgrade	Manual, belt drive. 12g	BB	91
Ariston Q-Deck £165	Good Average +	Well engineered and good sounding low cost package which is both easy to set up and to use	Semi-auto, belt drive, solid	BB	67
Dual CS430 £100	Average Average -	Ragged, sometimes unpleasant cartridge mixes with a modest pleasing player in a very sharply priced package	Belt drive, with cartridge, auto return, 5g	R	67
Dual CS5000 £230	Average Average +	The rare 78 facility may give grandma's collection a new lease of life but the player did not merit recommendation on price vs sound	Electronic, belt drive, subchassis, 10g		48
Dual CS503-2 £140	Good - Average	Not wholly inspiring; generally coarse and woolly sound is at least not offensive, but easily bettered by the CS505-4. Good value in material terms	Semi auto, belt drive, 10g	R	91
Dual CS505-4 £160	Good - Good -	The old-time favourite which never gives up. Sound is enjoyable if not perfectly clear, all-round value is excellent	Semi-auto, belt drive	BB	91
Goldmund ST4 £4589	Very Good Excellent	The Studio turntable takes on a cheaper tonearm than the T3F, yet provides a similar reference standard objective and subjective performance at £2,000 less, in a neatly integrated though bulky package	Solid subchassis, direct drive, parallel arm, detachable h/shell	R	60
Heybrook TT2 turntable & arm £424/£269	Average Good +	A gradual process of informed evolution and a sensibly designed arm combine to make this a good sounding middle of the road package. Well supported by dealers	Manual subchassis motor with arm, belt drive, 14g	R	67
JVC AL-FQ555 £170	Average - Poor	Clear midband sound but woolly bass and crude treble. Ease of use however ranks highly, and there's little to go out of adjustment	Auto, direct drive, 5.5g		67
Kenwood DP-990 £400	Average Average	Smart, slick and massive player suitable for low compliance cartridges only. A good but not inspired performer	Semi-auto 2 speed direct drive, 16g		67
Kuzma Stabi/Stogi Reference £900/£700	Very Good Very Good	Beautifully made in a solid oak plinth, the Stabi also sounds very clear, detailed and extended. Stogi Reference is also most capable.	Manual, belt drive, subchassis. 12g	R	91
Linn Axis/Akito £433	Good - Average +	A neat, attractive and well-made package which delivers a rather harsh sound with a 'one-note' effect in the bass, but it's well suited to mid market systems	Belt drive, semi-suspended, electronic PSU, 10g		79
Linn LP12-Lingo/Ekos/Troika £1128/£1097/£798	Good + Good +	The classic reference is improved (at a price) by the Lingo but character remains the same - not as detailed or neutral as the best. Ekos arm, though pricey, is well made and suited to many decks	Manual, subchassis, belt drive, 9g	-R/-	91
Manticore Mantra/Musician £340/£170	Good + Good +	Well engineered deck with satisfying sound. The arm is particularly fine and very good value	Belt drive, suspended, 15g	R	79
Marantz TT400 £150	Average - Poor	Everything one hopes a budget deck won't be; coarse, confused, muddled and woolly. Construction isn't wonderful, either	Manual, belt drive 16g		91
NAD 5120 £90	Average Average	A number of running improvements have given this player a range and tautness denied its lazier sounding antecedents.	Semi-auto belt drive, detachable arm tube/weight, 9g	BB	67
Omega Point Silver/Black £895/£295	Good Good +	An avowedly stripped down turntable that lacks even an on/off switch, the Omega Point Silver offers fine midrange clarity and good stereo, but some HF compression and a lack of 'wellie'	Manual, solid, belt drive, unipivot, 11g		55
Opus 3 Continuo/Decca London International (Revised) £599/£99	Poor Good	Heavyweight motor unit with many fine properties, but which needs further development. The idiosyncratic arm is a suitable (though not ideal) platform for the Decca cartridge. For all its faults though, the whole transcends the sum of the parts	Belt-drive manual, damped unipivot arm, 12g		67
Rational Audio Aura 01 £189	Poor Good	Poor lab results reflect bad rumble, but midrange and treble are very pure and clean; idiosyncratic sound and styling should be tried!	Manual, belt drive, linear tracking arm 10g	R	91
Rega Planar 2 £155	Average + Good	A remarkable product at the price, surprisingly articulate and confident	Manual, 11.5g	BB	48
Rega Planar 3 £207	Good Good	A long time leader in its price category, the '3 (with its excellent RB300 arm) sounded nicely 'musical' in a balanced and coherent manner	Manual, 11.5g	BB	48
Revolver Rebel £185	Average Good -	Quite lively and detailed but not the strongest on subtlety, with slightly lumpy bass. Motor breakthrough audible, and watch for bent motor shaft on delivery!	Manual, belt drive, semi-suspended 12g	R	91
Revox B291* £892	Average - Average -	Sound quality ranks as below average. Subjective bandwidth is narrow and the music lacks grace and energy. Ease of use however is unrivalled	Automatic, remote controllable, direct drive parallel arm, prefitted cartridge		55
Rotel RP-855 £160	Good Good	Great sound for the money - detailed and clear with good bass and no irritating nasties	Belt drive, solid, speed adjust, 9g	BB	79
Systemdek IIX £248	Good Average +	Poised, clean sounding deck, forward and explicit in character. A good value deck under £250, and a relatively cheap and satisfactory suspended model	2 speed belt drive manual turntable and arm, 11g	R	67
Technics SL-DD33 £110	Average Average	As with the QD33 though better value	Automatic, direct drive, solid plinth, 7.5g, P-mount	BB	48
Technics SL-L20 £115	Poor Average -	A rather lightweight parallel tracker achieving a poor overall rating, with little to recommend it unless you dig facilities	Electronic, solid plinth, 5g, P-mount		48

The Directory

INTEGRATED TURNTABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	ISSUE
Technics SL-QD33 £140	Average Average	The quartz speed controlled version of the DD is short on sound quality but not features. But it did have fair focus and some depth	Automatic, Quartz, direct drive, solid plinth, 7.5g, P-mount	R	48
Technics SLBD-22 £90	Average - Average -	Not bad for the price and a great improvement on the L20, it performs reasonably when not stretched	Semi automatic, solid plinth, electronic, 6g P-mount	R	48
Thorens TD 166 Mk V £200	Good Good	Classic suspended-subchassis deck with clear, stable sound of no particular character. Unlikely to make enemies	Belt drive, suspended, 12g	BB	79
Thorens TD 280 Mk II £180	Good - Good -	Legendary Thorens build quality on the cheap - slightly unobtrusive sound but eminently liveable-with and very good value	Belt drive, solid, electronic PSU, 12g	BB	79
Thorens TD 316 Mk II £220	Good Good -	Very solid deck with neat split-chassis construction. Sound is a bit insecure in the bass, but it could suit classical music lovers well	Belt drive, suspended, electronic PSU, 12g	R	79
Thorens TD2001 £630	Good Good -	Similar to TD320 but much dearer - why? Sound is comfortable but not very detailed	Semi-auto, belt drive, subchassis 15g		91
Thorens TD320 Mk II £350	Good Good	Good, consistent sounding deck with much improved (but not ideal) arm. A little expensive for performance offered	Semi-auto two speed belt drive, 14g		67
Townshend Rock Reference/Excalibur £1995/£695	Excellent Excellent	Overall the closest reproduction to master tape we've yet heard, with stunning real bass and excellent neutrality. Front end damping trough improves LF detail significantly	Belt drive, suspended, electronic PSU, front-end damping, 12g	R	79
Voyd Reference/Helius Cyalene £5299/£1066	n/a Excellent	Voyd's flagship is equipped with three of the biggest motors in the business, a Lexan platter and a real brute of a power supply (it dwarfs most power amps!). A strong contender for best turntable in the known universe	Belt drive, 3 motors, subchassis, outboard PSU, 12/14g	R	Coll. '90
Well Tempered WTAT £1690	Average Very Good	Intriguing and challenging design. Musically it is not ideal, but it has a limpid quality and a lack of artificiality that sets standards as well as turning the ear, though it's not completely uncoloured. A charmer yet mainstream enough in its virtues to be viable	Manual 2-speed, damped, suspended arm, 7.5g	R	67
Zarathustra S4/Pluto 5A Prestige/PSU £1500/£2500/£500	n/a Excellent	The very well made and finished heavy platter S4 with the superb Pluto arm make a devastating combination ranking up there with the very best	Subchassis, manual, available without PSU	R	72

MOTOR UNITS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Ariston Superior £598	Good + Good	Good but slightly damped sound quality, with powerful and stable bass. The pro quo is a certain lack of pace, energy and resolution	Belt drive, subchassis, electronic		55
CEC ST930 £599	Good Very Good	A rarity - a serious hi-fi product that loses nothing to budget rivals in finish or convenience. Good clean sound, very stable and assured	Belt drive, external PSU, 78 speed inc.	R	79
CS Audio Resan kit for Rega £90	Good - Good	After-market kit to convert Rega 2 or 3 to semi-suspended subchassis style. Looks good and sounds tidier than original. Feedback is much reduced	Conversion kit, all work reversible	R	79
Michell Gyrodec £595	Good Good	Sweet and natural sounding player, well exploited by the Rega RB300 arm. Aesthetics, and the acres of acrylic, are unique	Manual, belt drive, suspended motor unit		55
Michell Syncro £265	Good Good	A happy blend of qualities endows the Syncro with a blend of subtlety and force - the mailed fist in the velvet glove. Easy on the ear in the best sense.	Manual, belt drive, suspended motor unit	R	67
NVA Senior £450	Good - Average	Very high sensitivity to low-frequency vibration, especially on NVA stand, gives strange subjective bass response and confused sound. Looks are unusual but pleasing	Belt drive, electronic PSU, two-part plinth		79
Oracle Alexandria Mk III £1195	Very Good Very Good	One of the most beautifully presented players made, and fully supported by superb separation, dynamics and a euphonious style of delivery.	Manual 2-speed belt drive	R	67
Oracle Paris £595	Good - Average	Looks good but sounds coarse, confused and uneven, with bass liable to thump	Belt drive, semi-suspended, electronic		91
Origin Live Oasis A £495	Good - Average	Rather coarse sound with lack of detail resolution - but lively presentation may appeal. Appearance is industrial	Belt drive, external mains filter, 33rpm only, suspended		79
Origin Live Oasis B £199	Average Average +	Aesthetics are not its strong point, but its lively and articulate - if idiosyncratic - sound will please some tastes. Highly resonant construction is very sensitive to feedback	Belt drive, 33Gy1/3Gyrpm only, solid plinth/subchassis		79
Oxford Acoustics Crystal Reference £2495	Very Good Excellent	This big, open and powerful sounding turntable works beautifully with Airtangent arm to give superb 3-D imagery. Recently updated to mk.II form	Manual, belt drive, subchassis, stand	R	60
Pink Triangle Anniversary £1175	Excellent Excellent	Possibly the most detailed, clear, neutral and therefore accurate deck around. Likeness to master tape is almost uncanny	Suspended, belt drive, electronic, motor on subchassis	R	91
Pink Triangle Export £676	Very Good Excellent	Basically a PT T00 with built-in power supply. Retains features of great transparency and neutrality. Review sample had highish motor noise - presumed untypical	Suspended, belt drive, electronic	R	91
Pink Triangle Little Pink Thing £392	Good + Very Good	Leads the field for clarity and neutrality at this price or a good bit more. It also looks very smart! Excellent value. Arm cut-out suits Rega or Linn style	Belt drive, semi-suspended, electronic PSU	R	79
Revolver £150	Average Average	Nicely balanced, but unimpressive timing and lightweight bass made this deck rather average for the price. Manufacturer has since made several changes, but not re-submitted for review	Manual, belt drive, solid plinth		48
Systemdek IIXE £248	Good Very Good	Fine, honestly specified and well built player which easily betters its closest stablemate, the IIX. Frankly, at the price it's a sonic bargain	Manual 2-speed, external PSU	R	67
Systemdek IV £495	Good Very Good	The level of wow is a theoretical concern at least, but elsewhere this player shines, combining euphony, information and imaging in a polished, untemperamental package	Two-speed manual belt drive	R	67
Voyd "The Voyd Plus" £2777	n/a Excellent	Based on the standard 3-motor Voyd but with upgrade options (better bearing, platter, etc) which take it half way to a Voyd Reference, so we've dubbed it The Voyd Plus. Superb build and finish; colourful, dramatic performance. A thoroughbred	Belt drive, 3 motors, subchassis, outboard PSU	R	72
Voyd Valdi £699	Good - Very Good	Recent power supply upgrade has resulted in alround improvements. This Perspex plattered, two motor deck is remarkably competent, revealing and neutral	Belt drive, suspended subchassis, electronic PSU		79
VPI HW-19 £1317	Very Good Very Good	Built to accommodate parallel tracking arms, this large but elegant deck produced clean, smooth sound when fitted with an SME arm. Good bass	Belt drive, suspended subchassis	R	79

TONEARMS

MODEL PRICE	LAB SOUND	COMMENTS	ARM EFF, MAS	VALUE	ISSUE
Airtangent 1B £1990	n/a Excellent	A complex but superbly built arm for high quality systems, giving excellent stereo and resolution	7.5g (vertical)	R	60
Alphason Delta £190	Good Average +	A highly competent design from Alphason gives good sound quality but with slight blurring and treble fizz	16g	R	48
Alphason HR100S £440	Very Good Very Good	This S-shaped arm sounds smooth, but nevertheless reproduces transients with fine attack	10g	R	Coll. '86

The Directory

TONEARMS

MODEL PRICE	LAB SOUND	COMMENTS	ARM EFF, MAS	VALUE	ISSUE
Alphason Opal £130	Good Average	This is a straightforward adequate sounding low cost arm, priced just above where it rightly belongs	10g		55
Alphason Xenon £260	Good Good +	A trimmed down HR100S, the Xenon has inferior bearings and a simpler finish, but sounds crisp and coherent. Fits any Linn cutout	12.75g	R	55
Ariston Enigma £99	Average Average +	Good but not the best in its class: mid-band sounds a little uneven; treble a trifle "brash"	11.5g		48
Audio Technica AT1130 £186	Good Good	Well suited to most cartridges including high compliance ones, the AT is smooth and tonally neutral, it slightly lacking in 'balls'	8.5g	R	67
Decca London International £49	Average + Average +	This uni-pivot design gives a rather rich tonal balance and some bass muddling. Could be good with Decca cartridges, but not well built	12g		48 Summ
Eminent Technology £1000	Good + Very Good	One of the best sounding tonearms around, the linear tracking Eminent delivers impressive stereo imagery, focus and transparent sound	9g (vertical)	R	Coll. '86
Goldmund T3F arm £4400	Excellent Excellent	This complex parallel tracker created an "ear-opening" experience when tested with a (since updated) Goldmund Studio turntable	16.5g	R	Coll. '87
Helius Orion 2 £490	Very Good Very Good	Excellently engineered with rigid bearings, free from slack. It remains expensive but the level of performance deserves Recommendation	12g	R	48
Kuzma Stogi Reference £699	Very Good Very Good	A large, solid and well-made arm that holds the cartridge firmly, giving exceptionally clear sound with just a hint of brightness	12g	R	79
Linn Ekos £1097	Very Good Very Good	Superb, state of the art design which builds significantly on Ittok's strengths	9g	R	67
Moth Arm £78	Good Good +	The ultimate budget arm? Refined, detailed, sweet and natural - performance improves in line with the rest of the system	12g	BB	60
Naim Aro £699	Good Good -	Designed for use on the Linn LP12, the Aro is a little bright and congested.	10.5g		91
Rega RB300 £115	Very Good Very Good	Despite its modest price this sets exceptional performance standards and could be used on a number of high-quality turntables	10-11g	BB	60
Roksan Artemiz £595	Average Good	Interesting design which works a treat on the Xerxes deck. Fits Rega cut-out.	8g		67
Roksan Tabriz £150	Good Good +	Though obviously targetted at Roksan's own Xerxes, it is also a good alternative to the Rega arms in many applications. A trifle bright.	9g	R	91
SME 3009 Series III £253	Good Average +	Comprehensively adjustable and very well made, suited to MM and high compliance MC cartridges	5g		48
SME 3009 Series IIIS £182	Good Average +	A simplified less flexible (as regards adjustment) Series III with a similarly 'soft' sonic character	5g		48
SME 3009R £335	Average + Average +	A higher mass version of the Series III designed for low compliance MC cartridges	12g		48
SME 309 £495	Very Good Very Good	Beautifully made, finished and presented, this arm is fully and easily adjustable and a highly neutral performer	10g	R	79
SME Series IV £810	Excellent Very Good	Superb engineering and finish with a finely balanced sound giving impressive stereo focus and low coloration	10.5g	R	60
SME Series V £1247	Excellent Very Good	Excellent in terms of design engineering and sound quality, this arm arguably sets a new reference standard regardless of price	10.5g	R	60

CARTRIDGES

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

Cartridges fall into two groups: high output models, capable of working directly into any amplifier, and more expensive low output models.

Stereotypically, low output cartridges use the moving coil principle of operation, have better mechanical integrity and tighter tolerances, and give better performance but at much higher cost. Most under-£150 amplifiers and many valve designs need either an extra head amp or

transformer to cope with the low output.

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

MODEL PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	ISSUE
Arcam C77 £22	Average + Average +	A sensible moving magnet package with good bounce at a competitive price	6-16g Normal, MM	BB	48
Arcam C77Mg £30	Average - Average	Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8g Normal, MM	BB	67
Arcam E77Mg £50	Average Average	Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8gN Normal, MM	R	48
Arcam P77Mg £60	Average + Average +	Cautiously recommended, the P77Mg was preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9g Normal, MM	R	48
Arcam PMX10 £100	Good + Very Good	Not the very clearest in complex high-frequency sounds, but lively and exciting, good transients	5-11g Low, MC	R	85
Audio Technica ART1 £800	Good + Very Good	This is a delicate and very fluid-sounding MC that tracks well, offers very low distortion and exceptionally good stereo separation	9-18g Low, MC	R	72
Audio Technica AT-420E £35	Average Average	Better suited to pop recordings, this MM bears some of the sonic hallmarks of the Linn K5	7-14g (damp) Normal, MM	R	67
Audio Technica AT-F3/OCC £74	Average + Good	Though the 'limited edition' badge is a trifle tongue-in-cheek, the 'F3' still offers excellent value	8-15g Low, MC	BB	67
Audio Technica AT-F5/OCC £106	Average Good +	This latest sample demonstrated some technical weaknesses but its spacious, fluid sound quality still represents a benchmark at this price	4-10g Low, MC	BB	67

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CARTRIDGES

MODEL PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	ISSUE
Audio Technica AT-OC7 £265	Good + Good +	The OC9 is better if you can afford the extra. But OC7 is at least a taste of the high-end at a sensible price	6-13g Low, MC	R	54
Audio Technica AT-OC9 £400	Average + Very Good	Tonal colours are reproduced faithfully and it rarely puts a foot wrong. Slightly less transparent than more costly MCs but it has got real wellie. Good value (really!)	6-14g Low, MC	R	60
Audio Technica AT95E £19	Average - Average	Clear, dynamic if richly balanced, the magnetic '95E is a definite Best Buy	8-14g Normal, MM	BB	48
Audionote IO2VDH £895	Good Very Good	One of the best, giving 'an extraordinarily relaxing midrange clarity', needs a transformer	8-18g Very low, MC	R	43
Audioquest AQ 404i-L £400	Very Good Good +	Slight harshness detracted from the performance of this otherwise clear-sounding and detailed cartridge	8-16g Low, MC		84
Audioquest AQ 7000 £1200	Good Good +	Stunning stereo imaging and good detail at low levels are spoiled by less-than-perfect tracking and high sensitivity to arms.	6-20g Low, MC		91
Audioquest MC5 £220	Average Average	Offers high-output benefits but the drooping frequency response and severe VTA error preclude recommendation	10-20g Normal, MC		54
Cello Chorale £750	Average + Good	Now available through a new distributor at a saving of some £300, the Chorale is still blessed with a delicate but highly detailed treble. Arm matching is a problem	3-9g Low, MC		72
Denon DL 103 £99	Average Good	This classic spherical stylus model gives a lively sound with powerful bass, and is popular in broadcast studios	6-16g Low, MC	R	48
Denon DL110 £69	Good Good	Firmly recommended as a fine all-rounder, this high-output moving coil model is likely to perform well in nearly all circumstances	6-16g Normal, MC	BB	48
Denon OL160 £89	Average + Good	Although listeners just preferred the 110, its brother here proved a twin in lab tests and is still "thoroughly competent"	6-16g Normal, MC		43
Dynavector 17D2 £280	Very Good Very Good	Clear, detailed, neutral and generally very informative - excellent .	6-18g L ow, MC	R	91
Dynavector DV-50X £99	Good Average	A high-output MC model with impressive lab performance, but whose tip and sound quality both disappointed	6-14g Normal, MC	R	48
Dynavector OV10X IV £125	Average Average +	Fine sounding and realistically priced, damping is recommended to ensure successful tracking ability	8-18g N Normal, MC	R	48
Dynavector OV23RS £230	Average + Good	Sound quality was described as "shut-in", lacking energy and sparkle but with some "edginess" in high frequencies	10-22g Low, MC		28
Dynavector XX-1 £680	Very Good Good +	Good, but not immensely competitive at the price, and not helped by comparison with the low output version	7-15g Normal, MC		84
Dynavector XX-1L £680	Very Good Very Good	Very clear, very detailed, no troubles with tracking; response lift around 20kHz seems to do no harm	7-13g Low, MC	R	84
Empire 800 Mk II £33	Good Average	This very high output MM appears to be based on the classic Ortofon VMS series. A trifle uninspiring overall	7-17g Normal, MM		67
Empire Benz Micro MC-2 £600	Average Good +	Similar to both the Empire MC1000 and vdH MC2 in design, the Benz offers a warmer and very transparent account of the music. Its tracking prowess is slightly limited	5-12g Low, MC	R	72
Empire MC-5M £110	Average + Good	A very low compliance renders this MC best suited to heavy tonearms while its sweet, non-aggressive sound quality earns it a recommendation	13-20g L ow, MC	R	67
Glanz GMC-10EH £50	Good Good	The rising HF trend of this high o/p MC may cause problems in certain systems but with a favourable wind its seductive qualities will win out	8-14g Normal, MC	R	67
Glanz GMC-10LX £80	Average + Average +	Bearing some of the hallmarks of the '10EH, the '10LX is still less competitive in the sonic stakes	7-15g L Low, MC		67
Glanz GMC-20E £129	Good + Good +	Very good tracking, smooth sound and good detail. Very slight surface noise enhancement	5-10g Low, MC	R	91
Glanz MFG-110EX £25	Average Average	A little bright but giving detailed bass and clear treble, this was competitive at the price	6-16g Normal, MM	R	43
Glanz MFG-310LX £50	Good + Very Good	Detail and treble outstanding for sub-£100 cartridge. Slight coloration may be due to body resonance	6-10g Normal, MF	BB	85
Glanz MFG-610LX £90	Good + Good +	Similar to cheaper '310 but slightly clearer transients and bass. Benefits from lowish impedance loading	3-10g Normal, MF	R	85
Goldmund Clearaudio £1500	Average + Very Good	Something of a mixed bag overall, its sonic character bears a strong resemblance to the Pradikat though it shares some of the hallmarks of the more expensive Accurate	5-12g Low, MC		60
Goldring 1012 £40	Good + Good	Slightly harsh sound but plenty of life and quite good detail. Some very high frequency coloration apparent	6-12g Normal, MM	R	85
Goldring 1022 £60	Good + Good	As with 1012, a touch harsh; detail and transient purity improved, though, and it goes well with electric guitar!	5-11g Normal, MM	R	85
Goldring 1042 £85	Good + Good	Not terribly subtle, and not such good value alongside 1012 and 1022. Quite lively, though	7-12g Normal, MM		91
Goldring Elan £16	Average + Average	A lightweight and frisky-sounding MM that appears to be based upon the same body as the Nagaoka mm4	7-15g Normal, MM	R	67
Goldring Epic II £26	Average Average +	An excellent budget choice though the limitations of the stylus are rather obvious at higher frequencies	5-12g Normal, MM	R	67
Goldring Eroica £100	Good Good -	More confused and coloured than its low-output sibling - high output less of an issue in these days of cheap MC-compatible amplifiers	8-15g Normal, MC		84
Goldring Eroica LX £115	Good + Good	Not the most subtle cartridge in the world; can sound edgy at times, but lively and informative	8-14g Low, MC	R	84
Goldring Excel £500	Average + Good	Goldring's most expensive cartridge to date errs on the warm and heavy side of neutral. Strong bass lines are its forte though its ability to resolve subtle treble details is weaker	6-13g Low, MC		72
Grado ZF3E + * £47.50	Average - Average	Downtilting balance disguises the brightness of this cartridge; bit of a mixed bag at this price	9-20g (damping) Normal, MM		54
Grado ZTE +1 £26.50	Average - Average	Bass and treble are a trifle coloured but the midband proved highly enjoyable. Ideal for budget systems	6-13g (damping) Normal, MM	R	54
Kiseki Blackheart £1795	Good Good	This cartridge demonstrated refined poise and a delicate but at once potent security, however, the price did seem a little on the high side compared to other Kisekis	6-16g Low, MC		60
Kiseki Blue Goldspot £450	Very Good Good +	Good bass and imaging, but hints of spit and coloration let the side down slightly	8-15g Low, MC		84
Kiseki Lapis Lazuli £4000	Good Very Good	Combining very sensible design concepts at a silly price, the Lapis Lazuli is best thought of as combining the detail of the MC3000 and the fluidity of the Clearaudios	4-12g Low, MC		60
Kiseki Purpleheart Sapphire £799	Good + Good +	Rare, beautiful to look at and sweet to listen to, our review of this high-flyer conjured up images of Japanese art	5-14g Low, MC		48
Koetsu Black S £612	Average Good +	The S is an OEM design built to Koetsu's blueprint. It features a sturdier fixing plate and offers a brighter, faster and more tactile sound than the earlier K	8-15g Low, MC	R	72

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The Directory

CARTRIDGES

MODEL PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	ISSUE
Linn Asaka £365	Good + Good +	Disciples of Linn who are trying to realise their true "Karma" may find that saving money is not a short cut to heaven	9-18g Low, MC	R	Coll. '86
Linn K5 £37	Average Average +	Not as crisply focused as the costlier Linn magnetics, the K5 offers a smoother presentation	7-16g Normal, MM	R	67
Linn K9 £89	Average Good	Linn threw this model into the leading pack by beefing up the Basik's bodywork, adding a super stylus, and keeping the price fair	6-15g Normal, MM	BB	Coll. '86
Linn Karma £552	Very Good Very Good	A specialist which is strongly recommended for Linn-based systems; results may be less predictable in more general application	9-18g Low, MC	R	Coll. '86
Linn Troika £798	Very Good Good +	Good all-rounder, but still some hint of unhappiness at very high levels. Good imaging and bass.	6-18g Low, MC		91
London Maroon £149	Average Average +	Now manufactured under the London brandname this Decca cartridge is as iconeclastic as ever	9-20g (damp) Normal, MM		67
London Super Gold £300	Poor Average -	Immediate and (in the midrange at least) detailed, but very coloured, very nonlinear and questionable effect on records. Devotees swear by it	9-15g, damp Normal, fixed stylus MM		84
Milltek Aurora £249	Good + Good +	An overall feeling of relaxed ease characterised this clear and atmospheric Kiseki-built cartridge	8-16g Normal, MC	R	Coll. '86
Milltek Olympia £349	Average + Good +	Warm and detailed sound - packs the punch of the best MCs with high output as a bonus	12-20g, (damping) Normal, MC	R	54
Nagaoka MM4 £9	Average - Average -	Clear punchy sound that delivers the rudiments of a good performance	6-16g Normal, MM	R	54
Nagaoka MP10 £18	Average Average	High frequencies sounded "shut-in" with this spherical-stylus model, but mid and mass were energetic, bouncy and punchy	5-13g Normal, MM	R	48
Nagaoka MP11 Boron £40	Average Average +	Responding well overall in PM's equipment and listening room, this model was mildly criticised for low level and dynamic limitations	5-13g Normal, MM	BB	48
Nagaoka MP11 Gold £47	Average - Average +	There were mild criticisms directed at most areas, but in general the sound was clear, open and even	3-8g Normal, MM	R	48
Nagaoka Stilton TS10 £50	Good - Good	Stilton-designed solid body (with three-point mounting) certainly gives remarkably resonance-free sound, but tip and generator are less good - a little rough at times.	5-10g Normal, MM	R	85
Nagaoka Stilton TS11 £70	Good - Good	Differs from TS10 in having Vital stylus with better tracing but still some high frequency harshness.	5-10g Normal, MM		85
Ortofon 510 £30	Good Good +	For the price, a good blend of virtues - weight, clarity and neutrality.	3-11g Normal, MM	BB	85
Ortofon 520 £50	Average Average +	Very sensitive to load capacitance this new Ortofon maintains the company tradition for a lively, effervescent SQ	7-16g Normal, MM	R	67
Ortofon 530 £80	Good + Good +	Very clean and assured sound; transients not quite perfectly pure but plenty of detail.	4-11g Normal, MM	R	85
Ortofon 540 £100	Average - Average	Graced with an advanced FGII stylus our sample possessed too high a compliance for broad arm matching. It could also sound a little unforgivin	3-8g Normal, MM		67
Ortofon MC10 Super £70	Average Good	"What a delightfully sweet-sounding cartridge this is . . ." we said	5-15g Low, MC	BB	48
Ortofon MC20 Super £200	Average + Good +	An "inviting" sound quality; polite rather than exciting it approaches much more expensive models, but does not better them	6-15g Low, MC	R	Coll. '86
Ortofon MC30 Super £270	Very Good Good +	Beautifully engineered and well-balanced, it was slightly criticised as bland, though some may appreciate the lack of rough edges	5-14g Low, MC		Coll. '87
Ortofon MC3000 MkII £850	Very Good Excellent	Low levels of body resonance are a real ear-opener. Nothing to criticise elsewhere; one of the very best	9-16g Low, MC	R	84
Ortofon MC5000 £1500	Good + Good	Review sample could not be fully run-in, which might explain limited tracking ability and bright and forward sound, though imaging is excellent. Fussy about s.	12-20g Low, MC		91
Ortofon Quartz £120	Good + Good	Lively, quite detailed, and a touch bright, the Quartz has many qualities of the much dearer Quasar	3-12g Low, MC	R	91
Ortofon Quasar £300	Very Good Very Good	Many of the qualities of the MC3000, although a touch bright. Good detail and delicacy	8-15g Low, MC	R	84
RATA RP20 £22	Average - Average	Good integration, a clear dynamic midrange and the beginnings of fine stereo imagery merits clear recommendation	6-14g Normal, MM	R	48
RATA RP40 £44	Average Average +	The '40 did a good job of sorting out the layers and complexity of the mix, with good focus, excellent stereo spread and fine scale	6-15g Normal, MM	R	48
RATA RP70 £77*	Average Average +	Clearer and sweeter than the '40 this also seemed heavier and less lively. For £99 you can have a van den Hul stylus	6-14g Normal, MM		43
RATA RP70vdH £99	Average + Good	Able to retrieve bags of musical detail (thanks to the vdH stylus), RATA's top cartridge ranks as one of the most articulate MM's available	11-18g Normal, MM	R	67
Rega Bias £34	Average Average +	Difficult to mount in some arms due to its shallow build, the bias offers a gentile, refined SQ that certainly makes it worthy of audition	4-10g Normal, MM		67
Rega Elys £74	Good Good	Clearly superior to the Bias, despite their common heritage, the Elys is both more detailed, accurate and musically convincing	8-15g Normal, MM	R	67
Revolver £20	Average + Average	This modified AT-95E enjoys a very lively mid and treble even if the bass is somewhat 'slower' in comparison. A firm budget buy	8-16g Normal, MM	BB	67
Roksan Corus Black £100	Good + Good	Recognisably related to Corus Blue, but distinctly more civilised and smoother.	7-12g Normal, MM	R	91
Roksan Corus Blue £60	Good + Good	Roksan-specified modified Goldring 1012; slight harshness detracts from otherwise good sound.	7-11g Normal, MM		91
Shure M104E £36	Average - Average	Capable in many ways, but giving no substantial improvement over the 92E in our view	5-15g Normal, MM		38
Shure M105E £49	Average Average -	A slightly 'spitty' sound lacking deep bass and dynamic contrast, but can be used in virtually every system where it will perform "unobtrusively"	5-12g Normal, MM		38 Summ
Shure M110HE £60	Average Average	Sound quality was thought eminently presentable, but not exciting; smooth clear high frequencies, but a loss of bass definition	5-10g Normal, MM		38 Summ
Shure M111HE £72	Average Average	Early reviews of this cartridge complained principally of the price - which has since come down	5-10g Normal, MM		38 Summ
Shure M92E £17	Average - Average	Though lacking depth, the overall sound quality was competent, but treble was not its forte	10-15g Normal, MM		43
Shure M99E £29	Average - Average -	Sister to the 92E this is a solid but not particularly exciting cartridge	5-10g Normal, MM		38 Summ

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CARTRIDGES

MODEL PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	ISSUE
Shure ME75ED £26.50	Average Average -	Rather bright and splashy in the high frequencies but nevertheless a competent model	5-10g Normal, MM		38
Shure ME97HE £49	Average Average +	It won't turn a sow's ear of a turntable into a silk purse, but will at least keep going and produce an acceptable result	8-20g Normal, MM	R	48
Shure ML120HE £95	Average + Average +	Quite decent sound quality and a generally fine balanced performance	6-18g Normal, MM		48
Shure ML140HE £120	Average + Good	Qualitatively the treble of this well-balanced moving magnet model was a match for many moving coil cartridges	6-16g Normal, MM		43
Shure Ultra 500 £499	Good Good	There was no doubting the accomplishments of what could well be the finest moving magnet cartridge around	6-14g Normal, MM		48
Shure V15 VMR £215	Good Average +	Initial listening gave promising results, but extended familiarity gave the feeling of a lack of energy and a "shut-in" sound	5-12g Normal, MM		38
Shure VST V £173	Very Good Very Good	Quite exceptional assurance with difficult material; very stable and clear sound. One of the best. Dynamic Stabilizer actually works!	4-11g Normal, MM	R	85
Stilton/AT-F3 £110	Good + Good +	At a premium of some £40 this modified AT-F3 offers a startlingly refined performance and is strongly recommended	8-18g Low, MC	R	67
van den Hul MC One £699	Good Very Good	This extended all the positive qualities of the '10 but added greater authority and scale - worth it for the extra money	6-12g Low, MC	R	60
van den Hul MC Two £899	Good Very Good	Connected directly to any standard MM input the vdH MC Two rewards with a highly detailed yet fluid and musically convincing portrayal	6-13g Normal, MC	R	72
van den Hul MC1 Super £800	Very Good Very Good	Slight softening effect on transients was the only real flaw, but it didn't quite seem to have that special touch one expects for the money	8-15g Low, MC		84
van den Hul MC10 £499	Good Good +	A neutral balanced performer giving transparent midrange, fine depth and focus with firm extended bass. Gosh!	5-10g Low, MC	R	60

AMPLIFIERS

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

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

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

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

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

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Acoustic Research A03 £170	Average + Average	New slimmed down version of the A04 with less power and facilities but also a slightly 'fuzzy' sound	38W, MM disc, CD direct and 3 aux inputs		74
Acoustic Research A07 £300	Very Good Average +	Relatively smooth but ineffectual sound quality that lacks some weight and impetus at very low frequencies	75W, 4 line, 2AV and MM/MC inputs		68
Aiwa XA-005 £130	Good + Average -	A technically competent amp with big, friendly but not overly engrossing sound quality	61W, MM 5 line inputs, source-direct		80
Aiwa XA-006 £130	Good Average	Competent enough performer with plenty of facilities. A gutsy sound though one that's rougher via CD than MM.	67W, MM and 5 line i/p's plus independent rec out.		92
Akai AM-52 £230	Average + Average -	Basically equipped, this amplifier offers a comfortable but hardly over-detailed sound	95W, MM/MC disc, 5 line inputs, loudness		74
Akai AM-65B £299	Good Average	On-board 18-Bit DAC's actually give better sound than standard CD inputs! Punchy via MM disc	101W, MM, 6 line, digital inputs		80
Akai AM-93 £550	Average Average -	Unfortunately Akai's on-board D/A converters were less successful than its conventional analogue CD input.	112W, coax and optical dig inputs. MM/MC		68
Alphason Apollo £300	Average- Average+	Our early production sample was beset with a variety of niggling problems. Laid-back though not unmusical sound.	54W, 5 line, tape and MM/MC inputs. Solid wood fascia		92
Amadeus Gold £360	Average - Good	There is some indication of instability but otherwise sounds very rich, warm and musical. High-ish IMD	56W, MM/MC plug-in cards, 3 line inputs	R	74
Amadeus Silver £270	Average - Good	Limited headroom via disc but still offers a sweet, lush sound. Limited current delivery	37W, MM/MC, 3 line inputs	R	80
Aragon 4004 £1795	Good Good	Despite its imposing bulk, the Aragon is something of a softy at heart. It can deliver oodles of power but its musical presentation is more laid-back	231W power amp		72
Arcam Alpha 2 £190	Good Good +	Very confident, convincingly musical and punchy sound that sets the standard for other budget amps	41W, 4 line and MM inputs	BB	68
Arcam Delta 110/120 £700/£500	Good+ Good	Overall performance is limited by the power amp - in isolation the PDM-preamp offers a remarkably open and detailed sound, particularly in 'digital' mode.	112W power amp, MM/MC + four line inputs + coax/opt digital input.	R/-	92
Arcam Delta 60 £300	Good Good +	Very refined and highly detailed sound via MM and CD without any of the hardness noted via the MC stage	59W, 4 line, MM/MC inputs, no tone controls	R	68
Arcam Delta 90.2 £400	Average + Average +	Dark but slightly dead or conservative sounding version of the original Delta 90. Improved disc stage	73W, MM/MC, 4 line inputs, tone bypass, bi-wire	R	74
Ariston Amp £219	Average Average +	Slightly veiled and thin sound but proved suitably attractive in the listening tests	32W, full logic control, MM and 4 line inputs	R	68
Audio Innovations Series 1000/2nd Audio Amplifier £1499/2950	Poor Excellent	This valve combination offers awesome dynamic range with superb transparency and power to match. Compatibility with other brands is unpredictable	15W, MM, 6 inputs, monoblocks	R	63

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AMPLIFIERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Audio Innovations Series 200 £449	Poor Very Good	Like most 'Innovations valve power amps, compatibility with other brands is unpredictable. Hardly a powerhouse, but nicely 'open', transparent and dynamic sound in small(ish) systems	12W	R	77
Audio Innovations Series 300 £499	Poor Very Good	Something of an anomaly, the 300 is an integrated valve amp that looks awful in the lab but sounds remarkable in a system - now in mk II guise	10W, MM, 6 inputs	BB	63
Audio Innovations Series 400 £669	Poor Very Good	Superior styling and better build quality than the Series 300 make for a very attractive integrated valve amp. Capable of fine results in the right system, but can sound too 'thin' and lacking in welly with inefficient speakers	12W, MM and 4 line inputs	R	77
Audio Note Ongaku £29,950	n/a Excellent	An out and out audiophile product, a single ended, zero negative feedback, triode, line level integrated amp. Probably the best amplifier in the world!	6 line inputs, 27W	R	Coll '90
Audiolab 8000A £350	Very Good Good +	Exceptionally detailed, tactile and transparent via CD but slightly more clouded via disc. A stalwart design	72W, MM/MC, 4 line and full record out selection	R	74
Audiolab 8000C £325	Excellent Good	A well established preamp with a highly controlled sound, though it could do with more life and depth	MM/MC, 5 inputs, hdph, tone controls	R	62
Audiolab 8000P £495	Excellent Good +	A dynamic powerhouse, load tolerant and sonically reliable	100W	R	62
Audion CD-1 £399	Average + Very Good	Nicely presented valve (line-only) preamplifier with fine bandwidth and enjoyable, musical sound. Great - if you can justify the cost. Well worth hearing	5 line inputs		77
Aura VA-40 £190	Average Average +	Based on ITL's earlier MA80, this amp sounded slightly withdrawn or 'dead' if inoffensive	55W, MM 4 line inputs, MOSFET output		80
Beard 506 £1195	Good + Good +	A versatile valve preamp - the bass sounded lively if a touch softened, while the treble was detailed but lacked a little sparkle and air.	4 inputs MM/MC		50
Beard Audio CA35/P35mkII £695/£895	Average + Very Good	Good build quality and a very smart finish combine with a characteristic valve sound to make a first class amplifier capable of giving hours of musical enjoyment	35W, MM/MC, 4 inputs	R	63
Beard M70 £1995 pair	Good Good +	A substantial British monoblok power amplifier, but not a great deal more impressive than the P35 at half the price	70W		50
Bryston 0.5B/2B £695/£695	Very Good Good	Very rugged Canadian pre/power combo that sounds cool, confident and punchy. Headamp available to suit MC cartridges	65W, MM and 4 line sources, overload LEDs on power amp	R	74
Bryston 12B/4B £1295/£1395	Good + Good	Bryston's massive 4B power amp stood out as the backbone of this combo, the preamp sounding a trifle unbalanced between MM and MC inputs	272W, bridgeable to 800W. 6 line, 2 disc inputs, subsonic filter		68
Cambridge P25 £180	Good+ Average	Despite clocking-up a solid set of measurements the sound of the P25 proved to be as grey as its appearance.	37W, 4 line and MM/MC inputs + tone defeat.		92
Cambridge P50 £200	Good Average +	A pleasant enough sound with full bass yet with a slightly mechanical quality that reduced its sense of 'naturalness'	56W, 4 line inputs + MM/MC + tone		85
Cello Audio Suite £1200	Excellent Excellent	Cello's preamp represents a whole new ball game in flexibility and sound quality (or war of attrition on your wallet)	Optional inputs MC etc	R	50
Chord SPM-900 £1725	Average + Good +	Technically very interesting, this mini-powerhouse uses a switched-mode supply to deliver a crisp and refined sound	236W with protection into lower loads	R	85
Concordant Excelsior £856	Very Good Excellent	Cottage industry styling might not inspire confidence, but sonically this preamp is tremendously vivid and detailed. Real high-end performance. We loved it!	MM plus 3 line inputs. External power supply	R	77
Conrad Johnson Motif MC-8 £1995	Very Good Very Good	A cheaper alternative to the '7, this preamp is an undoubted success in maintaining the Motif sound but does not compare on sound quality	MM/MC	R	50
Conrad Johnson MV50 £1995	Good + Good +	Coupled with the PV5, this CJ power amp performed well on audition	50W		Coll. '87
Conrad-Johnson Premier Seven £8995	n/a Excellent	Price has increased since we tested it - but at this price who cares? The 'Seven is designed without compromise, and it's clearly one of the finest (valve) preamplifiers money can buy. Absolutely gorgeous!	MM, 4 line inputs, sep. Rec Out, versatile cartridge matching	R	72
Conrad-Johnson PV10 £1395	Excellent Excellent	Pricey, yes, but a fabulous preamplifier which confirms C-J's high reputation in the States. Beautiful imaging, superb detail, plenty of gain on the phono stage - classy build quality too.	MM plus 4 line inputs	R	78
Creek CAS 4140S2 £220	Average Good	Disc headroom still poor but the open and detailed, if slightly bright, sound wins through	40W, MM/MC, 3 line inputs, mono R and mute	R	80
Creek CAS-4040 S3 £200	Good Good	Now in mk3 guise the '4040 offers a dry but tidy sound via disc and one that's slightly leaner and better focussed on CD.	41W, 3 line and one MM disc i/p. Tone controls.	R	92
Croft Series 4S £850	Good Good	The original IV is still available now supplemented by the higher price and power (S); both are fine performers	40(60)W channel	R	57
Croft Series 4SA £1000	Good Very Good	Featuring tuned components chosen for their sound quality, the 'A' variant is an impressive example of Croft's technique in valve design	60W special supply regulation	R	57
Croft Super Micro A £549	Average + Very Good	The looks are somewhat improved, while this 'hot rod' version with tuned components performed very well indeed. There is still no gain on the line inputs. Now in mk.II form	4 inputs, MM, straight line	R	57
Cyclone Catalyst £1995	Good + Very Good	Exceptionally load tolerant and very refined in delivery. Extra options available in future	74W, external MM or MC stages, 3 R line inputs	R	80
Deltec DPA 100S £2200	Very Good Very Good	A top-quality transistor power amp, sounding fast, articulate and well controlled, though maybe a touch clinical for some tastes	80W	R	50
Deltec DSP-50S DPA-50S £725/£925	Excellent Excellent	Remarkable pre/power combo based around the highly linear DH-OA32 hybrid op-amp. Unmatched detail resolution, control and transparency	63W, external feedback wiring. 3 line, MM/MC no tone controls	R	68
Denon DAP-2500/POA-4400A £550/£600 pr.	Very Good Good	Denon's fully-fledged preamp also incorporates D/A converters that did not improve the sound of our £299 CD player. The power amps are brill!	172W, monobloks Opt/Coax dig + 2 tape, 4 line and MM/MC inputs		68
Denon PMA-250II £130	Good Good +	Spacious yet tactile and gutsy sound via all inputs. Worthwhile upgrade over original PMA-250	53W, MM 3 line inputs, source-direct	R	80
Denon PMA-350 £160	Average+ Good	Bold claims were made at its launch but the sweet and inoffensive sound, though very pleasant, is not mould-breaking at the price.	88W, 5 line and MM disc inputs + source direct.	R	92
Denon POA-6600 £1000 pr.	Excellent Very Good	Delivers abundant high quality sound, solid engineering expertise and content clearly compensating for any compromising of purist audiophile principles - now in revised A form	250W monoblok, remote power	R	60
DNM 3A From £1000	Good + Very Good	The DNM3 in its acrylic case is a remarkably revealing and neutral state of the art preamp	5 inputs MM/MC twin vol controls	R	44
Dual CV5600 £150	Good+ Very Good	Made by Rotel and possessing the highly articulate vocal/string quality of their best budget amps. Very communicative, especially with a good CD player.	57W, 3 line, 2 tape and one MM input. CD direct	BB	92
E.A.R. 549 £3628 pr	Very Good Very Good	A valve monoblok that measures like a solid state amp is itself an achievement, but exceptional power delivery and bass 'slam' is not fully matched by delicacy and transparency elsewhere	200W monoblok, bias setting		60
E.A.R. 802/509mkII £1098/£1868	Average Very Good	Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100W, MM, 6 inputs, monobloks	R	63
Entire Sound EX50 £500	Average- Average+	A new and fairly costly Mosfet power amp of limited output. Resolution of detail is pretty good but sound is cold-hearted.	40W Power amp. Internal P/S included for ES preamp.		92

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AMPLIFIERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Exposure VI/VII*/VIII £320/£500	Good Very Good	An established company like Exposure could do more to improve the 'look' of these amps which, nevertheless, sounded confident, dry and musical. Dual version no longer available	63W, Super mod. 4 line and 2 disc inputs with full rec-out switching	R	68
Exposure VII/VIII £430/£470	Very Good Good	Supplied as a combination without the separate preamp power supply, this pre power combination performed satisfactorily especially on the moving coil input	50W, MM/MC, 3 inputs, straight line		62
Exposure XI/XII/VIII Super £1600	Good Very Good	New preamp and improved power amp led to a smooth and refined sound, MM/MC less transparent than CD	61W, MM/MC, 5 line inputs	R	80
Grant G60AMS £948 pr.	Good Very Good	This neat and compact 60W valve monoblok gave good sound on the 8ohm tap, better still on 4ohms. The midrange was particularly natural	60W monobloks 8ohms	R	57
Hafler DH120 assembled £360	Very Good Average	Sound quality results were decent enough, but this power amp won't set the world on fire at this price	60W		44
Hafler DH120 kit form £295	n/a Average	Er, we didn't build one; see assembled version below	60W		44
Hafler XL-600 £1145	Very Good Very Good	Sounds remarkably open, transparent and inherently 'musical'. XL-600 is tremendously powerful and very compatible	426W in stereo mode, 1.5kW in bridge	R	74
Harman Kardon Citation 25/22 £699/£899	Good Average +	Not as outrageous as previous Citation amplifiers but neither as punchy nor exciting in the sonic stakes. A good all-rounder but lacks sparkle	138W, MM/MC full range of input and record out		74
Harman Kardon HK6100 £170	Good Good	Re-packaged version of the popular PM635. Still offers very up-beat and exciting sound	47W, MM, 5 line inputs, tone controls	R	80
Harman Kardon HK6500 £380	Good+ Good+	The best of HK's current range. A firm sound that enjoys an impressive grip on the most complex music. Great bass!	74W, 3 line, 2 tape and MM/MC Tone controls + loudness	R	92
Harman Kardon HK6800 £700	Good + Good	Smother and more evenly paced than previous H/K superamps, this model sounded both confident and nimble. A fine result	115W, 4 line + 2 tape i/p's + MM/MC	R	85
Heybrook C3/P3 £400/£500	Average + Average -	There's a chance our power amp was a dud for the combo sounded very disappointing on the whole - glassy and uncouth	138W with plenty of current. Passive line inputs		85
Jadis JP30/JA30 £4145/£4200	Average Excellent	Two-box preamp plus monoblok power amps, classic valve design gives stereotype valve sound. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at frequency extremes, in lab, and re cartridge matching	30W 2-box pre-, monoblok power, MM-only, 4 line inputs	R	60
Jeff Rowland Coherence One/Model 7 £3950/£9900	Very Good Very Good	The technical design of these amps is very elaborate but ensures they achieve an extraordinarily transparent and potent sound. However, the CD i/p is clearly superior to the disc inputs	448W monoblok MM/MC with variable loading options. Balanced topology	R	72
JVC AX-A3TN £140	Very Good Good	A true minimalist amp from the masters of mass-production! Offers a very comfortable, accessible sound yet with some loss of deep bass and extreme treble.	50W, 3 line, 1 tape and MM i/p's. CD DiRT and 'Bass Compensator' controls.	R	92
Kelvin Digital Integrated £550	Good + Very Good	Not so Class A as before but now fitted with a PDM DAC which offers a smooth, detailed and naturally 'musical' sound	34W, digital, line and MM i/p's only		85
Kelvin Integrated £449	Good Good	Recent mods have reversed the Integrated's previous good fortune, this unit was just too syrupy.	21W with 10-12W in Class A. Four line + MM/MC		92
Kelvin Labs Absolute Zero/M30 £395 + £295/£595pr.	Good + Average +	Latest versions of the M30 offers a true 30W Class A and a slightly muddled but very comfortable sound. MC preamp is a very linear design	33W monoblok MC only + 4 line inputs. Separate L/R balance	R	74
Kenwood KA-4010 £170	Good Average +	A flexible design at moderate cost. Smooth and cultured sound if slightly lean in balance	81W, MM/MC, 4 line inputs, source-direct	R	80
Kenwood KA-5020 £210	Very Good Good+	Something of a powerhouse on the cheap this amp can keep pace with the most challenging of dynamics. Its sound is vibrant but some fine detail is lost.	115W, 3 line, 3 tape and MM/MC. Source direct.	R	92
Kenwood KA-550D £130	Very Good Average	Having dropped its moving coil input, this latest version has British style dynamics and rhythm but is not first grade yet	35W, MM, 4 inputs, hdph, tone controls	R	62
Kenwood KA-7010 £300	Average + Average +	More powerful version of the 5010 but less successful in the listening tests. RF IMD is the likely cause.	123W, as above plus -20dB mute facility		74
Klyne SK5a £2590	Very Good Very Good	Beautifully made and presented, this American thoroughbred has a good lab performance, but although versatile, is rather expensive for the quality of sound offered	Balanced output, versatile cartridge loading		72
Lecson Quattra £350	Average+ Good	Underpowered but with the flexibility of four independent power amps. Very deep, captivating sound with 3D soundstaging.	19W via all 4 channels. 5 line and MM/MC inputs.	R	92
Lectron JH50 £2300	Average Very Good	Sexily presented valve power amplifier from France. Lovely valve sound too, with delicate and airy top end. Not especially powerful and rather expensive - but very desirable!	50W		78
Linn LK1/LK280 £585/£747	Good Good -	A very modern, logic-controlled amp with distinctive and inoffensive sound quality. Its restrained sound could do with extra insight and zip.	84W, compact amp CMOS sw. for 2 tape, 2 line and MM/MC. xlr sockets.		68
Linx Nebula £500	Average + Average +	Ambitious both in style and design this amp was less impressive in the sonic arena — positive but two-dimensional	88W, logic-controlled i/p switching		85
Magnum MP150/MF150 £320/£320	Average + Good	This is no technical masterpiece but the strain-free, fluid sound augers well for CD-based systems. Excellent value	89W, 3 line + MM/MC i/p's. No tone cont.	R	85
Marantz PM-30SE £180	Very Good Good+	The breathed-on version of Marantz' PM-30 offers an engagingly detailed and spacious sound though one that's warmer via MM disc than CD.	50W, 3 line, 2 tape and MM disc. Source direct	R	92
Marantz PM-50 £250	Good + Average +	One of Marantz's new breed, the PM-50 has a big and beefy sound yet one that lacks refinement	92W, MM/MC, 4 line inputs, source-direct		80
Marantz PM-75 £500	Good Average	More successful than most amps with on-board DACs but still not as balanced as other Marantz products	136W, opt/coax dig inputs, 6 line + MM/MC		68
Marantz PM-80 £400	Very Good Good +	Technically robust with an equally beefy and tactile sound. Great sense of power and control but spatially a little flat	133W, 3 tape, 4 line + MM/MC. Class A option	R	85
Marantz PM-95 £2000	Very Good Average +	Beautifully constructed, this amp was less convincing via its digital input than via line. Class A option best suited to sensitive speakers. Costly	151W with 30W available in Class A. Opt + coax inputs		74
Meridian 201/205 £695/£500 each	Very Good Good +	A fine preamp with additional luxury option of full system remote, plus competent and attractive monoblok power amplifiers with generally good performance	100W MM/MC 6 line inputs remoteR/-capable straight line		62
Mission Cyrus One II £200	Very Good Very Good	Crisp, meaty and exquisitely detailed, this latest Cyrus amp had us enthralled via CD. MM/MC enjoyed a lesser clarity	34W, 4 line + MM/MC i/p's with dual-conc vol.	R	85
Mission Cyrus PSX £230	Very Good Very Good	The PSX does make the Cyrus Two sound better; and also improves the PCM II CD player giving more wallop and clarity	Auxiliary power supply	R	62
Mission Cyrus Two II £330	Very Good Very Good	Recently updated this popular favourite captured our attention, once again, with its robust and very convincing sound.	60W, 4 line and both MM/MC disc. No tone controls	R	92
Musical Fidelity A1 £299	Average + Average +	Just scraping a recommendation, this current A1 sounded lush but sleepy — lacking the bite and sparkle of old	26W with 9W of Class A. 4 line + MM/MC inputs	R	85
Musical Fidelity A100 £499	Good + Very Good	This is another one recommended for fine sound with which you could keep your Chinese carry-outs warm	50W MM/mc 5 inputs straight line	R	62
Musical Fidelity B1 £200	Average + Good +	The subject of much controversy, this 50W wonder offers a very deep, solid and powerful sound	50W, MM/MC, 5 line inputs, tape monitor	R	80
Musical Fidelity B200 £349	Very Good Good +	Running cooler than other MFs, the B200 delivered fine musical and dynamic sounds with plenty of power	80W MM/mc 4 line inputs straight line	BB	62

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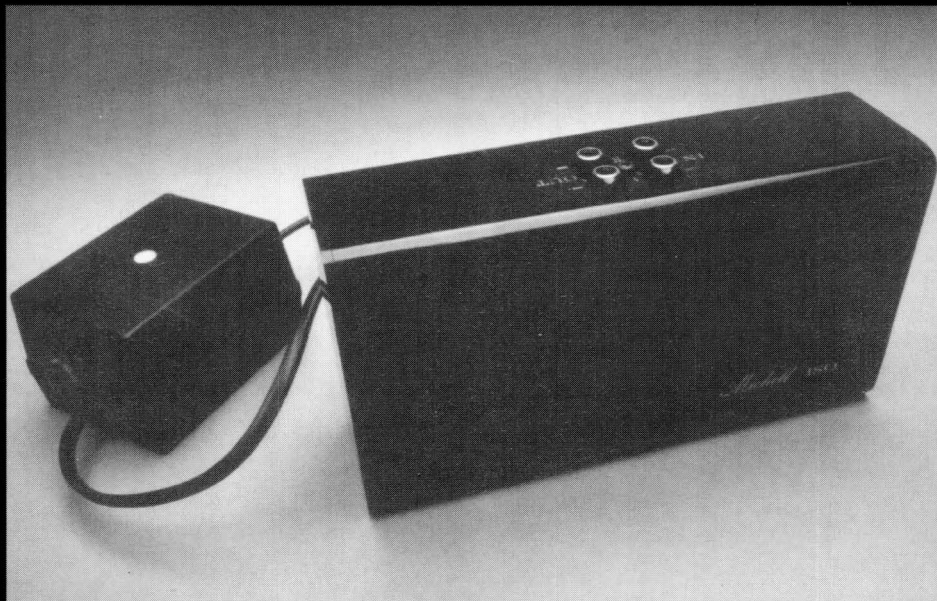
AMPLIFIERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Musical Fidelity MA50 £875 pair	Good Excellent	An audiophile bargain. One of the best sounding power amplifiers made	50W, monoblok	R	62
NAD 3020i £140	Very Good Good +	The most balanced and communicative of NAD's 3020 series. Great at revealing subtle musical clues without aggression	31W with tone controls, 3 line + MM inputs	BB	85
NAD 3225PE £160	Average + Average +	Light and detailed if not as rich or weighty sounding as others. MM input sounds warmer than CD	42W + 70W dyn. headroom; soft-clipping, MM only	R	68
Naim Separates £750 plus	Very Good Good	A consistent and coherent series of 'building blocks'. Sound quality ignores conventional audiophile standards of presentation, but achieves fine musical communication	40-70W, MM/MC etc	R	60
Nikko Beta 400/Alpha 800 £225/£800	Very Good Good	Big, bold and gutsy, these are indestructible amps with a sound quality to satisfy all but the most demanding users	358W(!) with every feature necessary	R	85
NVA P70MC/A60 £830	Average Average +	NVA's speaker cables are a must, the amp offering well-integrated but not particularly crisp sound	68W, MC, 3 passive line inputs		80
Oakley S £499	Good Very Good	Much improved version of the original Image preamp from Yugoslavia. This one won't disgrace itself even in top-notch systems. Image Six model (£150 more) is really fabulous	MM plus 3 line inputs	R	78
Dnkyo A-8000 £140	Good + Good +	A rare combination of style, features and very acceptable sound quality. Free of compression and 'grain' - undemanding	64W, 5 line + MM disc i/p's + full tone cont.	R	85
Orell SA-040 £359	Good Good +	This promising newcomer from a brand new company sounded pretty good and should improve as production settles	45W MM/MC, 4 line inputs, straight line	R	56
Orell SA-040SE £400	Average Average +	Very natural, relaxing if not overly exciting via CD, the sound closed-in to become 'pinched' or fettered via disc	64W, 5 line + MM/MC i/p's. Tweak components.		71
Philips DFA-888 £300	Good Average	As above but including a modified disc input and onboard DAC. Sounds tight but also slightly thin	107W, as above + opt and coax digital inputs		74
Philips FA-880 £200	Good Average	A new and cheaper design from Philips that sounds best via MM disc. Can appear soft and unbalanced via CD	108W, MM/MC source-direct tone		74
Philips FA960 MkII £300	Good + Average	The MkII '960 still failed to grasp our listeners' attention, but it remains a competent amp nonetheless	122W, 6 line & 2 disc inputs + tone controls		68
Pioneer A-300 £180	Very Good Good	The cheapest of Pioneer's dynamic duo gives off its best with CD rather than MM disc which failed to shine quite so brightly.	55W, 3 line, 2 tape and MM. Independent rec out facility.	R	92
Pioneer A-400 £230	Very Good Very Good	Pioneer's design concept snaps into focus with the A-400, an amp that seems to bubble with musical detail. A bench-mark that other manufacturers should strive for.	71W, 3 line, 2 tape, MM/MC. Independent R-out switching.	BB	92
Proton 520 £115	Average Average	Very well equipped budget amp with a slightly flat and undynamic sound - acceptable at the price though	31W, MM/MC with variable MC gain, 4 line inputs	R	74
Proton AP-1000/AA-1150 £250/£395	Good + Average +	Bags of headroom available from this pre/power combo, but can seem bloated or unrefined via MM	67W, MM/MC, adjustable MC gain, 5 line inputs		80
QED A240 CD II £199	Good + Good	Latest 240CD is fine value for CD and has competent MM disc input as well	45W MM 5 line inputs straight line	BB	62
QED A240 SA II £259	Very Good Good +	Redesigned 240SA has significant improvements over its predecessor, and provides a good moving-coil disc input in a competitive price	45W MM/MC 5 line inputs straight line	BB	62
QED A270 £299	Good - Good +	Building on the strengths of the '240, the '270 sounds weighty, fast and dynamic. A bit 'lumpy' via MC	51W, 5 line and 2 disc inputs, pre-out	R	68
QED C300/P300 £300/£300	Good Good	A cost-effective combo, limited in its resolution but no less beguiling as a result. Disc stage is sweeter but samey	58W, 2 tape, 3 line, MM/MC + mono/biamp opt.	R	85
Quad 34 £299	Very Good Average	This well-built durable preamp has useful filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4 inputs MM/MC tone controls		44
Quad 405 £389	Very Good Average	Not an impressive power amp but easy on the ear if not pushed and very reliable	100W		44
Rational Audio £175	Average- Average+	This wacky newcomer from Czechoslovakia offers a very open and fluid sound via CD but its performance via MM depends very much on the cartridge's load impedance.	129W, caters for line and MM disc sources but has no i/p selector.		92
Ray Lumley Model 75 £1995 pr	Average Good +	Monstrous valve monoblocks which represent good value. What they lack in musical subtlety they make up for in sheer muscle. And these are Lumley's small monoblocks!	75W monoblok		78
Revox B150 £1047	Very Good Average +	Beautifully constructed but hampered by Revox's convoluted logic control. Open and smooth sound. Still costly.	117W, CMOS sw. for 3 line, 2 tape and MM		68
Revox B250 £1467	Very Good Good	With much improved sound over its predecessors plus amazing remote control facilities, this could form the heart of a round-the-dream-house system	150W MM/MC system/house remote tone controls		56
Rose RV-23 £395	Good Very Good	Beautifully built classy British 'hybrid' preamplifier. You can spend more to get a more transparent sound - but it's hard to criticise the Rose given the competitive price	MM plus 3 line inputs	R	77
Rotel RA-810A £120	Very Good Average	As a cut price RA820AII this is a very successful little amp that loses little in sound quality to its predecessor. Excellent value	20W, MM, 5 inputs, hdhp, tone controls	BB	62
Rotel RA-820AX £150	Very Good Very Good	The spacious, detailed and very musical performance of this budget amp is almost too good!	47W, MM, 4 line inputs	BB	80
Rotel RA-820BX4 £190	Good + Good +	Very authoritative but creamy-smooth and delightfully musical. Spatially convincing too, yet not as open as RA-820AX	39W, 4 line + MM/MC, dual-conc. R volume.	R	85
Rotel RA-840BX4 £250	Good Good +	Very sedate and controlled in presentation but check phasing for optimum stereo effect	63W, MM/MC, 4 line inputs, tone controls		80
Rotel RA-870BX £300	Very Good Good +	A powerful blockbuster with solid and well focused sound, good versatility and fine load tolerance	85W MM/mc 7 line inputs tone controls	R	56
Rotel RC/RB-850 £140/£160	Very Good Good +	Quality separate pre and power amplifiers at near budget integrated amplifier prices. A notable achievement	60W MM/mc 4 line inputs tone controls	BB	62
Rotel RC/RB-870BX £220/£230	Excellent Good +	Reduced price makes the 870 combo better value but, despite mods to the preamp, it is the power amp that must take the lion's share of credit	128W or 208W bridged CD direct, 4line, 2 tape and MM/MC	R	68
SAE P102/A202 £499/£599	Average + Average +	Microprocessor-controlled pre and power amp that sounds much better at low rather than high volume levels. Pro-oriented aesthetics	151W, MM/MC + CD tuner and 2 tape tone memory, spk switching		74
Sansui AU-X111 £110	Good Average	Sansui has engineered an amp that's both solid and flexible for the price, but its sound is rather bland compared to competition in the £110 sector	5 line inputs, MM, 52W		92
Sansui AU-X9110G £700	Very Good Good +	At its best when used with the on-board MASH/PWM DAC where it sounds technically neutral but still emotionally charged	112W, 4 dig, 3 line and MM/MC i/p's. Rec-out	R	85
Sony TA-F630ESD £350	Good Average	Based on the '530 but equipped with PDM D/A convertor. Amp is competent but DAC sounds truly magnificent!	130W, as above + opt. and coax digital inputs	R	74
Sony TA-F730ES £450	Very Good Good	A very stable and coherent amp but one that lacks a crucial sense of involvement	133W, MM/MC, 3 tape, 2 line, full rec-out		80
Sugden A21a £395	Average+ Good	The modern-day relative of Sugden's original Class A amp and one that offers a smooth, easy-going sound. Best partnered with sensitive speakers.	25W power amp with a good 16W in Pure Class A.		92
Sumo Athena/Polaris £695/£695	Very Good Very Good	Very good value US pre/power combo with transparent, detailed and gutsy sound via all inputs	128W, MM/mc, 2 tape and 3 line inputs	R	80

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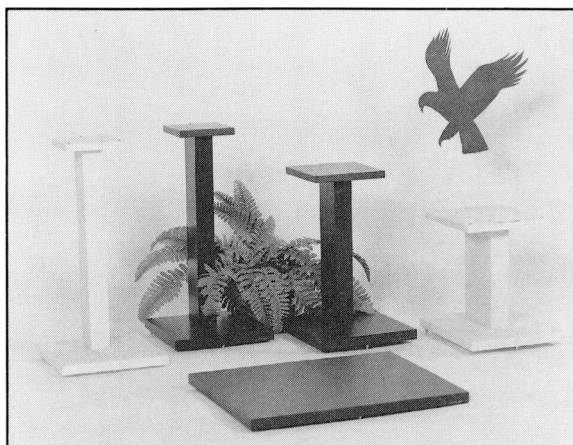


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The Directory

AMPLIFIERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Teac A-X400 £115	Average Average	Sibilance and a lack of crisp vitality hamper the performance of this amp, as does the stringent protection circuitry	59W, 4 line + MM + tone + mic i/p level control	R	85
Technics SE-M100 £550	Very Good Good +	An unusual disc-less poweramp with volume control. Standard line input sounds very open and clean. Digital input is harsher and less convincing	123W, coax and opt digital inputs, var and direct CD no disc input	R	74
Technics SU-810 £130	Average + Average	Our sample started off sounding fast, taut and well-integrated yet eventually failed on the MM disc input	66W, 2 tape + 3 line + MM. Tone + loudness	R	85
Technics SU-V660 £250	Good Average	Chunky build but integrated output stage infers a weak, insubstantial and rather monophonic sound	107W, MM/MC, cd aux, tape + tuner + power amp-direct	R	74
Technics SU-V900 £500	Very Good Good+	Massively built but with a light, fresh and essentially very neutral sound. Bulk notwithstanding it's not particularly suited to life with a difficult speaker.	125W, 5 line and both MM/MC inputs. Tone controls + power amp.	R	92
Threshold FET 10e system/Stasis SA-4 £5700/£5900	n/a Very Good	Almost valve-like limpidity and excellent soundstaging are star qualities of the Threshold amps. Line input resistive loading is too low	Component FET phono stage, line pre, FET power amp 100w	R	Coll. '90
Yamaha AX-330e £100	Average + Average +	An improvement on earlier efforts but still a little bland or lack-lustre. Very compatible though	48W, MM, 3 line inputs, source-direct option	R	80
YBA 1 power amp £2995	Good Excellent	This equally well finished power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85W	R	62
YBA 1 preamp £2895	Very Good Excellent	A front line French audiophile product. Great stereo and a fine Krell style finish	MM/MC, 3 inputs, straight line	R	62
YBA 2 pre & pwr £1395/£1695	Very Good Very Good	Superbly finished French separates, with very good space and transparency, slightly softened bass. Needs extra transformer (£300) for MC cartridges	70W MM (MC extra) straight line	R	56
YBA Model 3 £995/£995	Good Good	Suited to highish sens. Loudspeakers this duo produced see-through, ethereal stereo images that were more convincing towards the centre of the soundstage than at the edges	56W stereo amp MM only with 3 line i/ p's	R	72

LOUDSPEAKERS

Last item in the hi-fi chain, to some extent the loudspeaker is merely the slave of what has gone before, capable only of reproducing a signal as good as it is fed. Nevertheless the distortions (colorations and stereo effects) introduced by loudspeakers (and rooms) tend to be more immediately obvious than those anywhere else in the chain, so careful choosing according to taste is very important

The average loudspeaker consists of a smallish enclosure, much of which may have begun life as part of a tree, plus a couple of drive

units hidden behind a removable grille. Inside the box lurks a simple electrical circuit known as a crossover, which divides the incoming (full range) signal into the right bits for the drivers to handle. Variations on the above formula are specifically identified in the entries. The designer's primary task is to balance the sensitivity of the loudspeaker (how loud it goes for a given electrical input) against the bass extension (how low does it go) for the given box size. After that such subtleties as coloration and dispersion come into the equation.

Careful placement of the loudspeakers within the room is as important as the initial choice of model.

For good stereo they need to be more or less the same distance from nearby walls, and preferably on rigid stands. The listener should be about the same distance from and listening angle to each loudspeaker. The ideal placement depends on the way a particular model has been balanced (not to mention a number of other factors), and our recommendation is given in the entries.

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY	VALUE	ISSUE
Acoustic Energy AE1 £748	Good Very Good	To the author's knowledge, the most awesomely dynamic and articulate miniature ever made	29.5 x 18 x 25cm semi-open space	88dB/w 60Hz	R	59
Acoustic Energy AE2 £897	Good Very Good	Dynamic, solid and lively, a great allrounder if a bit small considering the price. AE proves that metal cone/dome drivers really work	39 x 23.5 x 29.5cm heavy stands in free space	88.5dB/w 45Hz	R	66
Acoustic Energy AE3 £1650	Very Good Very Good	Solid, authoritative and impressively accurate – if a shade ponderous and slow – AE's latest 'big one' is a much better bet than the earlier '4, combining traditional monitoring virtues with the latest metal diaphragm technology	63 x 26.5 x 37cm low stands in free space	85dB/w 23Hz (in room)	R	86
Acoustic Research AR-112 £125	Average Average -	Nicely presented and engineered, but sounds a bit small and boxy without true coherence	36 x 19 x 18.5cm stands near rear wall	87dB/w 75Hz	R	66
Acoustic Research AR-122 £150	Average Average	Despite a promising enough list of ingredients, the 122 failed to excite real enthusiasm amongst the listening panel	38.5 x 19 x 22cm stands near rear wall	87dB/w 68Hz	R	68
Acoustic Research AR-132 £200	Average + Average -	Good presentation and detail engineering was not sufficient to counter bass heavy balance problems on auditioning	44.5 x 23 x 25.5cm stands 1ft from rear wall	87dB/w 50Hz	R	66
Acoustic Research Red Box £100	Average Average	Lively and balanced if a bit crude and uneven, this econobox succeeds partly because of its simplicity, and works well with some rear wall assistance	32 x 19.5 x 17cm close to rear wall	87dB/w 85Hz	R	74
Alexander SE11 £299 (stands £69)	Good Good	Clearly better than its cheaper stablemates, the metal jacket delivers a different, and in some respects superior, sound than the wood-based competition	52 x 14 x 17.5cm stands close to wall	86dB/w 25Hz (in room)	R	82
Alexander SE5 £199	Average Average	Particularly well suited to surround sound A/V applications, the SE5 can give any miniature a run for its money on bass performance; hardness and coloration mar good detail and clarity, and price is a little high	40.5 x 12 x 15cm ALS stands near wall	82dB/w 50Hz (in room)	R	78
Allison AL105 £150	Average Average -	Pretty enough in appearance, sonically the AL105 doesn't really make the grade at the £150 asking price	37 x 24 x 21cm high stands against wall	87dB/w 45Hz (in room)	R	78
Allison CD6 £290	Average Good -	An unusual cube-shaped model designed for wall mounting gives exceptional bass extension from a small box, though it's also a bit heavy, coloured and slow	28.5 x 28.5 x 28.5cm stands against rear wall	88dB/w 45Hz	R	71
Alphason Amphion £680	Good Good	This fine-sounding, nicely finished compact wall-mount is just a little too expensive for formal Recommendation, but is a good performer for all that	44 x 23 x 27.5cm high stands against wall	86dB/w 47Hz (in room)	R	78
Alphason Orpheus £1000	Good Good +	Large hi-tech two-way features unusual, sweet-sounding isodynamic tweeter; well engineered and balanced if a shade odd in appearance	65.5 x 28 x 34cm stands near rear wall	87dB/w 43Hz	R	71
Apogee Caliper Signature £3350	Good + Very Good	Pretty but power hungry full range panels have remarkable transparency and delicacy, though loudness and bass 'grunt' are both a bit lacking	122 x 59-70 x 6.5-28cm floor, free space	81dB/w 30Hz (in room)	R	81
Arcam Alpha £200	Good Good	It has its own colorations to be sure, but delivers a fine room balance with unusually good dynamics, timing and 'life', and is fine material value	46 x 26.5 x 26cm stands close to wall	89dB/w 30Hz (in room)	BB	82
Ariston Image £180	Average - Average -	Despite a sweet treble character, the Image fails to impress with a 'lumpy' over-rich balance that has room integration problems	42 x 22 x 27.5cm stands in free space	89dB/w 30Hz (in room)	R	82
Ariston Q £395	Average + Average	The prettily shaped Q delivers a good impression of scale from a small box, but a rather laid back, ponderous and over-rich overall sound space	35 x 16.5-25 x 20-27cm high stands in free	85dB/w 30Hz (in room)	R	86
ATC SCM20 £1320	Very Good Good +	Massively built to no-compromise Pro monitoring standards, the SCM20 is invariably informative but the rather forward presentation can be uncomfortable	44 x 24 x 31cm stands close to rear wall	82dB/w 28Hz (in room)	R	86

The Directory

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY	VALUE	ISSUE
Audio Electronics TC10 II £599	Good - Good +	Oddball appearance is rescued by a respectable technical performance, interesting and impressive engineering and fine sound quality	70 x 33.5 x 33.5cm low stands in free space	87.5dB/w 40Hz	R	68
Audioplan Kontrapunkt £799	Good Good +	Cute little German miniature sounds as sweet as it looks, dressed expensively in real wood with matching stands. Not for bass or loudness freaks	31 x 24 x 13cm free space, matching stands	83dB/w 48Hz (in room)	R	86
B&W CM1 £400	Good Average	Cleverly thought out luxury design package is also fundamentally well engineered, if a shade pricey on 'sound for pound' basis	24.5 x 16 x 22cm close to rear wall	84dB/w 90Hz		74
B&W DM550 £149	Good + Average -	Beautifully presented, well engineered near-miniature with precise sound but a distinct lack of 'welligie'. Ideal for considerate flat dwellers	35 x 20.5 x 22.5cm stands in free space	86dB/w 70Hz		71
B&W DM560 £199	Average + Average -	Fine cosmetic presentation and good engineering for the price; overload protection may be handy but listening panel was underwhelmed	49 x 23.5 x 30cm stands in free space	88dB/w 55Hz		66
B&W Matrix 801 £3295	Good + Good +	Lacks the transparency of the best panels, and the drama of the best dynamics, but is something of an acoustic tour de force, with low coloration and fine stereo imaging	77/99 x 56 x 43cm floor or stands, free space	86dB/w below 20Hz (in room)	R	81
B&W Vision DS1 £120	Average Average -	Although significantly hampered by upper bass cabinet coloration, the DS1 cleverly combines high sensitivity with a rich and generous soundstage	36 x 21 x 19cm stands quite close to wall	91dB/w 40Hz (in room)	R	82
B&W Vision DS2 £180	Average Average -	Although the box is generous for the price, the DS2 is a rather uneven performer, both on the measurement and listening. Careful stand selection and placement is needed to control the enthusiastic mid bass	50 x 24 x 25cm stands in free space	89dB/w 43Hz (in room)		86
Bose 305 £350	Average Good -	A bit of an oddball, fine dynamic liveliness and a good room match more than make up for the strange stereo imaging and treble	28 x 45 x 23cm high stands near wall	88dB/w 40Hz (in room)	R	78
Bose 901 MK6 £1600	Good Average	Still controversial after all these years, the pre-equalised multi-driver 901 is cleverly engineered to deliver exceptional loudness with a modest amplifier, but mid bass tends to dominate the sound and transparency is notably lacking	33 x 54 x 32cm rigid stands in free space	(92dB/w midband) 28Hz (in ro		86
Bose Interaudio 3000XL £150	Average Average -	Lots of perceived value and well enough balanced, but low cost cabinet and driver engineering results in a crude and unsuitable sound	46.5 x 29 x 23cm stands in free space	89dB/w 45Hz		71
Boston A120 £349	Average + Good -	Ugly but cleverly engineered, the 120 combines a tiny main driver with much larger ABR to give a generous, bighearted and lively sound despite little genuine bass extension and a few rough edges	62.5 x 31.5 x 25cm stands in free space	89dB/w 48Hz	R	86
Boston A4011 £120	Average Average -	Competent performance for size and price but below average relative to the UK competition	34 X 21 x 20cm on stands near wall	88.5dB/w 63Hz		41
Boston Acoustics T830 £399	Good Good	A lot of speaker for the money, the T830 is a smooth and accomplished performer with a big and easy - or alternatively a lazy and laid back - sound	82.5 x 25.5 x 24cm floor, away from walls	87dB/w 30Hz (in room)	R	82
Castle Clyde £159	Average + Average	A tidy little performer packing punch, but beginning to show its age in the light of new competition	37 x 21.5 x 22cm open space on stands	89.5dB/w 64Hz	R	46
Castle Durham £209	Average + Average	Listening results were encouraging, well engineered and finished, but lean on treble and a bit weak on bass; still recommended	41 x 21.5 x 25cm near rear wall	89dB/w	R	46
Castle Pembroke £229	Good Average +	Comfortably recommended, a sweet smooth sound with good overall balance of engineering-based performance	55 x 37.5 x 30.5cm open space on stands	88dB/w 46Hz	R	31
Castle Warwick £179	Good Average -	Excellent presentation and fine engineering with overload protection, but a sonic disappointment in bass and dynamic qualities	46.5 x 25 x 23cm stands 1ft from rear wall	88dB/w 50Hz		66
Castle Winchester £1250	Very Good Very Good	This unconventional and beautifully crafted model is physically large for its bass extension but is engagingly agile and sounds attractively open and airy	114 x 24 x 47cm in free space	87dB/w 25Hz	R	90
Celef CF2 Nimbus £230	Good - Good -	Nicely balanced overall but a little uneven with it, this lively and dynamic largebookshelf model came close recommendation	46 x 25.5 x 24cm stands in free space	88dB/w 55Hz		71
Celef Cirrus £180	Average Good	It's nice to see Celef back in the UK, with this decent sounding small reflex box that seems unusually tolerant of siting	39 x 20.5 x 23cm stands in free space	84dB/w 60Hz	R	66
Celestion 3 £109	Average + Average	This attractive little wall-mount gives good balance and stereo imagery, with a character which leans more towards inoffensiveness than excitement	31 x 18.5 x 21cm high stands against wall	86dB/w 55Hz (in room)	R	78
Celestion 5 £149	Good Average	Cunningly conceived and balanced, the 5 may be a little slow for some tastes, but is well suited to CD-oriented budget systems	35 x 20.5 x 26cm heavy stands close to wall	89dB/w 30Hz		90
Celestion 6000 £1470	Very Good Very Good	A genuine fullrange audiophile quality speaker system - with Star Wars styling to suit a high tech environment	Complex, on floor in free space	82.5dB/w	R	60
Celestion DL6 Series II £179	Good Average	Good tonal colouring and plenty of bass for the enclosure size; the metal dome tweeter is excellent, but bass and mid lack clarity and 'bite'	45.4 x 24.5 x 26.2cm near wall, on stands	87dB/w 65Hz		59
Celestion DL8 Series II £199	Very Good Good	A refined middle market speaker has a smooth but slightly dull quality, with good definition and deep, if slightly boxy bass	50 x 27.5 x 27.8cm open, stands	87.5dB/w 60Hz	R	59
Celestion SL12Si £599	Average Average	Careful setting up does reveal elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling	53 x 20 x 27cm matching stands clear of walls	85dB/w 50Hz		66
Celestion SL600Si £799	Good + Good	This Aerolam high tech miniature has certain remarkable qualities that some will find irresistible, but needs careful system and room matching	27 x 20 x 23cm free air on tall stands	82dB/w 52Hz		68
Creek CLF20 £200	Good Average -	Looks good material value, but sound is distinctly over-rich and thick in the mid-bass region; maybe the box is a little too large.	49 x 24.5 x 24cm open frame stands, free space	88dB/W 30Hz		90
Dali 700 £600	Very Good Average	Good material value and fine bass extension for size and price, but overall sound is disappointing, perhaps due to complexity of driver array	110 x 28 x 35cm clear of walls	88dB/w 20Hz		90
DCM Timeframe TF250 £350	Average + Average	Neat and unusual floorstanding presentation, marred by indifferent build and cuddly but rather coloured sound, especially on spoken word	86 x 32 x 16cm close to rear wall	88dB/w 45Hz		90
Doxa 5 - 2 £900	Average Good	The high sensitivity and seductive midband makes an obvious partner for valve amplifiers, though obtaining a good room match may prove a little tricky	98 x 21 x 28cm floor well away from walls	91dB/w 30Hz (in room)	R	82
Duntech PCL1000 Crown Prince £6120	Excellent	Immensely 'listenable', refined sounding speaker capable of creating lifelike musical images. Not overly transparent to source, but very civilised nonetheless	180 x 30.5 x 43.5 free standing away from walls	90dB/w 42Hz	R	72
Duntech PCL500 Marquis £3998	n/a Very Good	Better value for money than the Crown Prince - and arguably more dynamic, with real bass 'slam' but a little less refined in the higher registers	147.5 x 27 x 40cm free standing away from walls	92dB/w 48Hz	R	65
Equation 0 £1290	Average + Very Good	Expensive but most attractive floorstanding miniature. Bass is limited and mid tends to shout but sound is fast and lively with fine dynamics and timing	85 x 20 x 35.5cm floor, c1ft from wall	85dB/w 45Hz	R	90
Goodmans B-Max/Maxim 2 £100/£90	Poor Average -	Stick with the Maxims on their own until you can afford some real grown up loudspeakers	60 x 21 x 26 see above, suck and see	89dB/w 55Hz (in room)		78
Goodmans HIM 440 £350	Good Average -	Amazing perceived value, sensitivity and good bass extension, marred by serious cabinet coloration, a nasty tweeter and a difficult amplifier load	87 x 38 x 40cm low stands clear of walls	94dB/w 24Hz		90
Goodmans M100 £80	Average + Average -	Effectively a Maxim on the cheap, the M100 measures more smoothly but sounds somehow less involving than its more famous stablemate	20 x 17 x 26cm close to rear wall	85dB/w 50Hz (in room)	R	86
Goodmans M300 £100	Average Average -	Conveying much of the charm and life which has made the Maxim 2 so popular, the M300 is sensitive, but hampered by upper bass cabinet coloration	38.5 x 21.5 x 17cm stands close to rear wall	89dB/w 50Hz (in room)	R	82
Goodmans Maxim 2 £90	Average + Average	More wham-bam-thank-you-mam sound that imitates much bigger speakers when you let these babies yell. (A well-controlled yell)	26 x 17 x 19cm near wall on shelf or stand	86dB/w 85Hz	BB	59

The Directory

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY	VALUE	ISSUE
Harbeth HL Compact From £539	Very Good Average	The clean and neutral sound lacks resolution and gives rather unobtrusive though well differentiated stereo. Can be bi-wired to advantage	52 x 27.2 x 28.1cm open space, on high stands	87.5dB/w 65Hz		59
Harbeth LS3/5A £343	Good Average	Still a classic miniature, though not to every taste, and none the better for the recent update under our listening conditions. Limited dynamic range	30.5 x 19 x 16cm stands in free space	81dB/w 60Hz		66
Heco Interior 120 £169	Good Average	Drab appearance belies a lively enough character, though the balance is altogether a bit bright for UK tastes	32 x 23 x 23cm high stands against wall	88dB/w 50Hz (in room)		78
Heco Interior 430 £429	Good Good -	This tall floorstanding enclosure delivers an impressively even sound balance with good bass extension, if not the lively dynamics to satisfy enthusiasts	85 x 24 x 27.5cm free space	88dB/w 43Hz	R	71
Heco Interior 90 £159	Good Average -	Neatly finished and engineered miniature, but the disappointingly 'lifeless' sound left the listening panel decidedly underwhelmed	27 x 18 x 16cm on high stands	87.5dB/w 90Hz		74
Heco Superior 740 £599	Good Good -	A similar sonic package to the cheaper Interior 530, these Superior clothes are very pretty indeed, though spikes are still awaited	84.5 x 22 x 25cm on floor in free space	88dB/w 30Hz (in room)		78
Heco Superior 940 £999	Good Good	This large and beautifully finished floorstander has an impressively smooth and attractively transparent midband. Bass is well extended but follows rather than drives the music along.	110 x 26 x 31.5cm free space	88dB/w 20Hz		86
Heybrook HB1 £199	Good Average +	No longer an over-bright character, a strikingly clear sound and fine transient performance now merits recommendation	47 x 29 x 23cm on stands near wall	88dB/w 61Hz	R	46
Heybrook HB100 £255	Average + Good	Well matched for wall siting, the HB100 is a lively and informative performer in the tradition of the popular HB1	47 x 26 x 28cm stands near rear wall	86dB/w 50Hz	BB	66
Heybrook HB150 £319	Average Good	Convincingly communicative but a bit coloured and congested, this lively compact wall-mount is nicely finished but a little costly for the content	40.5 x 23 x 22cm stands close to rear wall	89dB/w 42Hz (in room)		82
Heybrook HB200 £399	Average Average	This luxury successor to the HB2 is lively and informative, but sounded insufficiently balanced to convince our listening panel	46 x 23 x 26cm stands against rear wall	87dB/w 55Hz		66
Heybrook Point 5 £139	Average Average	"Uncouth yet still satisfying", the Point 5 gives good dynamics and bass for a compact wall-mount, but is burdened by a somewhat unhappy treble	37.5 x 23 x 24cm high stands against wall	85dB/w 32Hz (in room)		78
Heybrook Point 7 £185	Average Average	Physically an attractive package, but not entirely convincing in lab or listening panel test; interesting for all that	40.5 x 23 x 23cm stands against rear wall	85dB/w 60Hz		68
Heybrook Solo £149	Average + Average +	Discreetly styled wallmount sounds a little untidy in both bass and treble but handles complex rhythmic material much better than most	36 x 23 x 22cm HBS1 stands close to wall	87dB/w 28Hz	R	90
Infinity Kappa 6 £795	Good Good	Interestingly styled US loudspeaker has unusual high tech drivers and good neutrality, but the sound seriously lacks excitement	63 x 38 x 24cm stands, free space	85dB/w 35Hz		66
Infinity Kappa 8 £1850	n/a Very Good	Very nicely made and unobtrusive but large four-way speakers which have a tendency to sound bass heavy unless used with solid core cables	118 x 51.5 x 17.5cm floor standing, open space	89dB/w 33Hz		72
Infinity Modulus £695	Good Average +	Luxury high-tech miniature is carefully conceived and beautifully executed. Undeniably attractive in the midrange and treble, the Modulus failed to handle the bass end of the spectrum as successfully	30 x 18 x 26cm high stands 1ft from wall	84dB/w 45Hz (in room)		86
Infinity RS2001 £180	Average Average +	A little coloured and unruly in the treble, the 2001 nevertheless retains the lively dynamic bounce of its predecessor; pity the price has gone up	36.5 x 22.5 x 20cm lightweight stands	87dB/w 50Hz (in room)	R	78
Jamo Concert 2 £230	Good Average -	A thoroughly respectable 'bookshelf' performer that needs free space siting but includes attractive cabinetwork and a neat grille	41 x 24 x 25cm stands in free space	85dB/w 48Hz		66
Jamo Cornet 40 £99	Good Average	Prettily styled Danish miniature is good perceived value and delivers solid bass and midrange performance but is let down by an indifferent tweeter	31.5 x 19.5 x 21.5cm about 1ft from wall	87dB/w 48Hz		90
JBL Control 1 Plus £229	Average Average	Sub-miniature with forward midrange and no real bass; highish price partly justified by cute, near-indestructible Pro styling and build	23 x 15.5 x 14cm close to rear wall	89dB/w 50Hz		90
JBL LX33 £259	Average + Good	A bit of a cheat, but a lot of speaker for the money, which manages a better room balance than many 'large bookshelf' rivals, and delivers a fine acoustic performance	80 x 25 x 21cm floor, 1ft from wall	89dB/w 48Hz	R	82
JBL LX44 £339	Good - Average	This generously built model offers good power handling, bass extension and dynamic range, but suffers from the 'three-way syndrome', with middle muddle	58.5 x 30 x 29cm stands in free space	89dB/w 40Hz		71
JBL TLX12 £149	Good - Average	This smart near-miniature has a 'boppy', lively bottom end, but beware of the fizz in its top	37 x 23 x 23cm stands 0.5m from rear wall	87dB/w 55Hz	R	71
JBL XPL 90 £699	Good Average +	Though undoubtedly pretty and very expensively engineered, this elaborate near-miniature didn't really convince our listeners that it could deliver a sound quality to match its elevated price	39.5 x 24 x 24cm stands in free space	85dB/w 45Hz (in room)		86
JPW AP2 £175	Good Good	Few grounds for criticism but purchasers should check out the treble qualities to avoid hammering the ear anvils	46 x 26 x 25cm 40cm from wall on 45cm stands	89dB/w 65Hz	R	53
JPW AP3 £225	Good Average +	Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52 x 25 x 29.5cm near wall on stands	90dB/w 57Hz	R	46
JPW Minim £85	Average + Average -	Very civilised but dynamically limited, the Minim is well suited to the smaller room and where limited loudness is acceptable	27.5 x 18 x 19.5cm stands against wall	85dB/w 28Hz (in room)	R	82
JPW P1 £145	Good Average +	Honest and basically articulate if not very sophisticated, resolution is good but it can sound a little wearing in bright systems or with rough sounding material	44 x 25.9 x 26.1cm free space on stands	89dB/w 60Hz	R	59
JPW Sonata £115	Good Average +	Well balanced and integrated, this near-miniature offers fine sound if limited bass and dynamic range, plus real tree wood at a nearly silly price	32 x 23 x 20cm stands near rear wall	86dB/w 55Hz	BB	71
JPW Sonata Plus £135	Average Average -	This luxury variation on the redoubtable Sonata theme features a metal dome tweeter, and is not the better for it	32 x 23 x 21cm about 1ft from wall	87dB/w 30Hz		90
JRT AD1 £500 (stands £100)	Average + Good +	A most auspicious Choice debut for relative newcomers JRT. A fair share of cosmetic deficiencies do little to spoil the impressive coherence and timing that makes this beautifully finished and generously proportioned model so enjoyable.	59.5 x 28 x 36cm own stands close to rear wall	86dB/w 28Hz (in room)	R	86
KEF 103/3 £750	Good + Good	Technically impressive, excellent bass/power handling for size, but not for the audiophile system. Better among cheaper components, and good in a large room	56 x 27 x 30cm supplied stands free space	90-95dB/w 35Hz		53
KEF 104/2 £1,150	Very Good Very Good	A reference point for dynamics, preferred without KUBE, suited to many rooms. Good stereo, high sound level	90 x 28 x 41.5cm floor standing in free space	92dB/w 50Hz	R	60
KEF C15 £119	Good Average	One of the tiniest around delivers a surprisingly 'big' and well balanced sound, with excellent stereo from free space siting	26.5 x 18 x 14cm stands in free space	85dB/w 60Hz	R	71
KEF C25 £149	Average + Average -	Very safe and competent, but rather short on inspiration, the '25 lacks the brio and flair of its smaller C15 brother	34 x 20.5 x 17cm high stands near wall	87dB/w 60Hz (in room)		78
KEF C45 £219	Good Average -	Conventional and competitively priced, C45 delivers an impressively consistent and competent sound. As one listener commented: "Offensively inoffensive whether it be love or loathing, give me some emotion"	47.5 x 28 x 24cm uncritical	87dB/w 30Hz (in room)		86
KEF C55 £249	Good Average +	Similar to but less good value than C75, the '55 provides Uni-Q stereo stability but not real wood veneer or good low frequency room match	48 x 24.5 x 25cm stands, free space	91dB/w 30Hz (in room)		82

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MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY	VALUE	ISSUE
KEF C75 £339	Good Good	Compact floorstanding model's Uni-Q driver provides fine crossover integration, giving stable stereo and fine dynamic range within a slightly 'rich' balance	72 x 24.5 x 25.5cm floor in free space	90dB/w 45Hz	R	71
KEF C85 £549	Good Good	Essentially a simplified vinyl finish version of C95, the 85 delivers a similarly coherent, neutral, rich and slightly lazy sound	88 x 25 x 22cm well clear of walls	89dB/w 27Hz	R	90
KEF C95 £649	Good Good	Rich and lazy, but nonetheless very endearing in a cosy sort of way, the '95 is a lot of speaker for the money, and delivers a big sound with grace and subtlety	88.5 x 24.5 x 31cm floor in free space	90dB/w 28Hz (in room)	R	78
Lindley New Age £1100	Average - Average +	Attractively different presentation with classy finish, this tall cylindrical floorstander has fine bass extension but a rather uneven overall balance	105 x 23 x 23cm clear of walls	86dB/w 25Hz		90
Linn Index II/KuStone £235/£109	Good Good	Combination of stand and speaker looks and sounds very good for the price, with good bass extension and control, and fine dynamic range. Clean, clear if a shade slow	44 x 21 x 23.5cm (box only) close to rear wall	86dB/w 28Hz	BB	90
Linn Kaber LS500 £989	Average Good +	Discreet wall-mount package trades sensitivity for fine bass extension and midbass performance; can be a little relentless but has prodigious dynamic capabilities	93 x 19 x 28cm floor against rear wall	86dB/w 28Hz (in room)	R	82
Linn Kan II £417	Average + Average +	A niche product for those prepared to tolerate its strong character for the sake of its fine bass performance and near invisibility	30.5 x 18.5 x 16.5cm Kan stands against wall	82dB/w 35Hz (in room)		78
Linn Nexus LS250 £449	Good Average	Good features include a solid, meaty bass plus good imagery and tonal balance. The catch is that Nexus lacks resolution and timing	49 x 23.5 x 30.4cm near rear wal supplied stands l	89dB/w 60Hz		59
Magneplanar MG1.4 £1190	Good + Good +	Replaces the stalwart MG1c with a revised panel layout. Offers a very crisp and articulate sound, particularly revealing of upper mid vocal details	155 x 8 x 57cm open space	88dB/w 40Hz	R	72
Magneplanar MG2.5R £1998	Good Good	Offers the low coloration and profound musical insight of better electrostatic loudspeakers but without loss of low frequency extension	183 x 56 x 4.5cm Open space	83-85dB/w 35Hz	R	60
Magneplanar MG11a £2700	Good Very Good	Another excellent true-audiophile loudspeaker this American panel speaker helps to convey much of the original character of the music	180 x 62 x 38cm well clear of walls	84-86dB/w 35Hz	R	46
Magneplanar SMGa £675	Average - Average	Tonally 'rich', in the right room it proved a satisfactory musical experience	122 x 48 x 4.5cm on floor clear of wall	85dB/w 56Hz		46
Marantz LD-50DMS £230	Very Good Good	Well behaved larger two-way has fine balance, stereo and integration with good bass extension, albeit with mild boxy, chesty and fizzy effects	106 x 22 x 32cm floor, free space	88dB/w 30Hz (in room)	R	71
Martin Logan CLS II £3998	n/a Very Good	Much improved high resolution design, fussy about system set-up and demanding of ancillaries and software alike. It rewards the efforts though	60 x 28 x 7.5cm open space	86dB/w 45Hz	R	72
Meridian M30 £895	Average + Average	Pricey but easy on the ears and worth considering especially where space is at a premium	38.5 x 18 x 32cm free space on stands	Active 40Hz		46
Mission 760 £100	Good Average +	Smart presentation and an engaging sound, this sensitive budget miniature sounds notably more lively and less boxy than most of its peers	29 x 18 x 20cm stands close to wall	88dB/w 50Hz	BB	90
Mission 761 £130	Average Good	One helluva speaker for the price, if a shade small and short of subtlety and refinement – should prove a worthy successor to the 70 and 700	38 x 21 x 21cm stands near rear wall	87dB/w 60Hz	BB	66
Mission 762 £200	Average Average -	Mission's 'bookshelf middleweight' offers high sensitivity and loudness capability, but at the expense of a somewhat untidy and rather 'heavy' sound	50 x 25 x 27cm stand, experiment advised	91dB/w 55Hz		66
Mission 763 £300	Average + Average +	A very artful combination of generous volume and good bass extension at a modest price. Works well in the listening room despite a few rough edges	77 x 25 x 32cm near rear wall	86dB/w 40Hz	BB	68
Mission 767 £2300	Very Good Very Good	Magnificent and massive part-active monoliths have fine acoustic subtlety and impressive loudness capability, ultimately limited by partnering electronics	138 x 29 x 43cm floor, flexible	91dB/w below 20Hz (in room)	R	81
Mission Cyrus 780 £170	Good Average +	Pricey but very pretty miniature based on Mission 760 but with beefed up box and crossover network to enhance sound quality still further	29 x 18 x 26cm light stands close to wall	88dB/w 50Hz	R	90
Mission Cyrus 781 £250	Average + Good	Properly run in, the pretty little 781 delivers a fast, dynamic and informative sound which more than justifies its price. Take care to adjust placement to suit room and system	43 x 22.5 x 28cm matching stands 1ft from wall	88dB/w 28Hz (in room)	R	86
Mission Cyrus 782 £350 (stands £80)	Good - Good -	Lively, articulate and beautifully finished, this compact wall-mount mode with l twin main drivers has good integration but a rather rich, 'Loudness' balance	50 x 25 x 32.5cm Cyrus stands near wall	90dB/w 50Hz		71
Monitor Audio MA1200 £900	Average Average +	This smooth and civilised slimline floorstanding loudspeaker is well built and nicely presented. But it is also expensive	94 x 20 x 26cm in free space	85dB/w 48Hz		68
Monitor Audio MA1800 £1400	Good Average +	Attractive and beautifully finished, even when ballasted with lead shot the 1800 inclines towards upper bass richness and lacks genuine extension	106 x 22 x 32cm floor, free space	88dB/w 30Hz (in room)		81
Monitor Audio Monitor 7 £170	Average - Average	This lively and punchy near-miniature looks pretty enough and is good value but is let down by an unruly and indifferently integrated tweeter	34 x 16.5 x 17cm stands 1ft from wall	84dB/w 70Hz		74
Monitor Audio Monitor 9 £200	Good Average	Despite a much better treble balance than the 7, the Monitor 9 is less engaging and lively at low frequencies than its smaller sibling	37 x 20 x 21cm high stands near wall	85dB/w 30Hz		78
Monitor Audio Studio 10 £1100	Average Average +	Expensive, luxury build/finish and all-metal driver diaphragms provide engagingly transparent midrange and treble, spoilt by over-strong mid-bass.	40 x 20 x 25cm heavy stands clear of walls	87dB/w 45Hz		90
Mordaunt-Short MS 3.10 £110	Average Average +	Probably the liveliest and most communicative miniature around, this beautifully presented design is probably better suited to budget 'real hi-fi' than the blandness of the midi system	28.5 x 17.5 x 20cm	88.5dB/w 48Hz	BB	78
Mordaunt-Short MS 3.20 £130	Average Average +	All the charm of its BB-rated £99 baby 3.10 brother, plus a smidgeon more bass for those in a suggestible frame of mind	35.5 x 18 x 20cm open stands against wall	85dB/w 50Hz (in room)	R	82
Mordaunt-Short MS 3.30 £190	Average Average +	A little too mid-forward for neutrality or formal recommendation, this attractive, good-sized model nevertheless has more than enough appealing qualities to merit serious consideration	46 x 23.5 x 27cm high stands 1-2ft from wall	87dB/w 38Hz (in room)		78
Mordaunt-Short MS 3.40 £250	Average + Average	It looks pretty and sounds civilised, but the 3.40 failed to ignite any degree of enthusiasm amongst our listeners. Low frequency stand and room matching is a bit tricky	57 x 23.5 x 27.5cm stands in free space	87dB/w 30Hz (in room)		86
NAD 8225 £150	Good Average +	Notwithstanding lacklustre styling and an unprepossessing appearance, this NAD miniature has a smooth and even midband plus an appealing overall jauntiness. The whole turns out to be worth more than the sum of its parts.	34 x 20 x 18cm stands close to wall	87dB/w 45Hz (in room)	R	86
NVA Cube 1 £600 (stands £200)	Good - Good +	Attractive, cube-shaped semi-omni is very sturdily built, and gives an idiosyncratic but unusually open, spacious and informative sound	33 x 32 x 32cm own stands c0.5m from wall	85dB/w 52Hz	R	71
NVA Cube 2 £380	Average Good	A rude but exciting miniature, with unusually accomplished bass capabilities for its size	28.5 x 27 x 28.5cm NVA stands against wall	85dB/w 48Hz (in room)	R	82
NVA Cubix £1100	Average Good	Too idiosyncratic for formal recommendation, the Cubix possesses remarkable bass extension for its size, but is tricky to optimise and has some aggressive tendencies	60 x 32.5 x 32.5cm	84dB/w 28Hz (in room)		78
Opus 3 Capella £599	Good Good	The sound of this Scandinavian curiosity certainly benefits from the crushed marble enclosure, though presentation is strictly DIY	32 x 40.5 x 26(ave)cm amongst books in bookcase	86.5dB/w 45Hz		66

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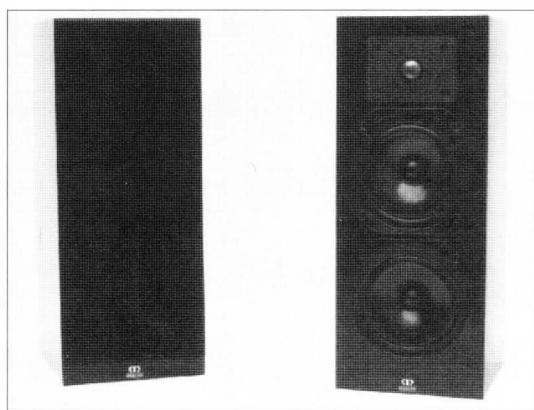
MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY	VALUE	ISSUE
Opus 3 Credo £399	Average Average	Credo's odd-shaped silicate-based cabinet confers good box and bass performance, but the sound could be more neutral for the price	32 x 28 x 32cm stands in free space	88dB/w 65Hz		74
Pearl & Oakley Victoria 200 £1099	Average - Average -	Extraordinary – and to many very attractive – ‘ginger jar’ presentation in Staffordshire ceramics, but let down by need for further acoustic and mechanical development	93 x 33 x 33cm on floor in free space	87dB/w 30Hz (in room)		78
Philips FB815 £250	Average Average	An impressively – indeed imposing – physical package for the price, clever engineering gives a very competent if slightly hard and brittle sound quality that somehow lacks genuine authority	63 x 27 x 27cm low stands in free space	85dB/w 30Hz		86
Philips FB825 £650	Good Good	Generous sounding and impressively uncongested for the type, loudness and bass extension don't quite match the large and rather plasticky box	110 x 29 x 41cm on cones clear of walls	88dB/w 25Hz	R	90
QLN Model One £700	Good Average	Similar to Signature at two thirds the price, Model One exaggerates the latter's rich and heavy midbass and lacks its velvet smoothness	35 x (16-25) x (21-27)cm pillar stands, free space	85dB/w 28Hz (in room)		82
QLN Signature £1100	Good Good	Beautiful but expensive luxury compact has a rather laid back and 'heavy' sound, but coloration is low and stereo imaging very good	37 x 18 x 36cm heavy stands in free space	83dB/w 30Hz (in room)		78
Quad ESL-63 £1860	Good + Very Good	With its unusual but subtle characteristics this classic electrostatic may not be punchy in the bass, but has strengths that some cannot live without	92 x 66 x 27cm open stand well clear of wall	84dB/w 34Hz	R	60
Richard Allan C05 £184	Average - Average -	This neatly presented small reflex design can sound engagingly communicative, but is flawed sonically and technically and quite expensive too	38 x 19 x 23cm on rigid stands	88dB/w 80Hz		68
Rogers LS2a £189	Average Average	Provides very good engineering and stereo performance for the price, alongside some 'boxiness' and certain dynamic constraints	36 x 23 x 21cm low stands 1ft from wall	86dB/w 50Hz (in room)		82
Rogers LS4a £249	Good Good -	This artfully voiced and well balanced compact gives a fair flavour of the classical 'BBC sound' at a very reasonable price	43 x 25.5 x 24.5cm stands 1ft from wall	87dB/w 32Hz (in room)	R	78
Rogers LS6a £309	Good Good	Stereotypically a Rogers model with impressively even balance, prospective purchasers will have to weigh the fine midband naturalness against slightly lazy dynamics and timing	51 x 27.5 x 28cm stands in free space	86dB/w 25Hz (in room)	R	86
Rogers LS7t £439	Good + Good +	A fine combination of classic qualities at reasonable price produces the "R" tag, but try to get a pair home on approval to check for bass 'heaviness'	56 x 27 x 28cm free space on 40cm stands	88.5dB/w 48Hz	R	59
Rogers Studio 1a £599	Very Good Good -	The classic BBC monitor style sound sensitively updated – transparent and natural with fine stereo, but a touch 'heavy' in balance	63.5 x 30.5 x 30.5cm stands in free space	87dB/w 36Hz	R	66
Roksan Darius £1395 (£345 integral stand)	Good Very Good	Now totally realigned, the current Darius provides an exceptionally impressive combination of transparency and delicacy with fine information retrieval and speed. The problem is affording the amplification to do it justice	47 x 27 x 40cm own stands angled in space	82dB/w 20Hz	R	86
Royd A7 Series 11 £115	Average + Average	Lively clear sound; good upper bass and dynamics, but treble "ramp" made vocals sound shut in. Try before you buy	31 x 20 x 17cm shelf or 50cm stands near wall	86dB/w 75Hz	R	53
Royd Apex £485	Average + Good	Not the smoothest sound around, it more than compensates with an impressively communicative and informative musical presentation	85.5 x 20 x 30cm on floor close to wall	87dB/w 33Hz (in room)	R	78
Royd Eden £235	Average Average +	Delightful mid/treble speed and transparency but determinedly bass light, this oddball miniature threatens cult status but could use a sweeter tweeter	31 x 20.5 x 18.5cm stands close to wall	87dB/w 85Hz	R	66
Royd Sintra £330	Average + Good	Balance is bass light and a little bright, but superb dynamics, speed and timing make this luxury miniature musically very informative and satisfying	30.5 x 20.5 x 19cm stands close to wall	88dB/w 50Hz	R	90
Ruark Swordsman £219	Good Average	Very attractively styled and finished, the Swordsman is a well built 'small bookshelf' model that delivered better test than listening results	38.5 x 20 x 27.5cm stands 0.5m from wall	84dB/w 50Hz		71
Ruark Talisman £629	Average Good	Clever and beautifully finished compact floorstander has some coloration but is impressively informative and communicative, with fine pace and timing	83.5 x 21.5 x 31 (max) cm close to rear wall	86dB/w 30Hz	R	90
SD Acoustics OBS £845	Average Good	Recent changes have added some refinement to a seductive midrange, good timing and fine sensitivity, though bass extension is limited and coloration obvious	102 x 35 x 25cm floor, angled, away from walls	92dB/w 30Hz (in room)	R	82
SD Acoustics Ribbon £2150	Average Good +	Entertaining but a little underdeveloped and rather amplifier sensitive, the Ribbon is a lively and loud hybrid marred by some colorations; some like it, others don't	152 x 30 x (15-30)cm floor, angled, away from walls	91dB/w 30Hz (in room)		81
SD Acoustics SD1 £1350	Average Very Good	A large scale, airy and unusually detailed system with excellent dynamics. Current model has more civilised top-end and warmer balance than original model	123.5 x 38.2 x 31.9cm free space	90dB/w 50Hz	R	60
SD Acoustics SD3 £379	Average Good	Neither cheap nor perfect, this near miniature (using OBS' mid driver down into the bass) sounds unusually lively and dynamic within inevitable physical constraints, and is ultimately both engaging and entertaining	38 x 19 x 29cm stands 10cm from wall	83dB/w	R	86
Seventh Veil System IV £1290 (£340 integral stand)	Average Good +	Lacks welly and loudness but delivers astonishing results with female vocals in particular. Antithesis of the 'good allrounder', this oddball design has considerable charm that the committed enthusiast might find irresistible	72 x 44 x 21 x 29cm own-stands close to wall	84dB/w 28Hz (in room)	R	86
Shan Shimna £280 (stands £75)	Average + Good	Pretty little miniature in cast mineral/plastics has limited dynamic range and could sound smoother, but integration is good and box effects slight	31 x 16 x 17cm stands near rear wall	84dB/w 65Hz	R	71
Snell Type C £2350	n/a Very Good	Pricely, yes, but an extremely capable loudspeaker. Musical and transparent; excellent bass extension which improves with the addition of a Pirate plinth	112 x 38 x 33cm free standing, free space	90dB/w 35Hz	R	65
Sony APM-101ES £100	Good Average	Big hearted sound from small bookshelf successor to BB '10ES, sounds a little untidy at frequency extremes, so suits CD better than vinyl	39.5 x 22.5 x 23.5cm stands, free space	86dB/w 52Hz	R	71
Sony APM-121ES £150	Average Average -	Good perceived high tech value, but the balance has an artificial 'loudness' character, too rich in the bass and too strong in the treble	43 x 25 x 28cm stands, free space	86dB/w 25Hz (in room)		86
Sony APM-141ES £200	Average Average	A great deal of loudspeaker for the money, the rich sounding '141 needs a big room and still shows significant 'loudness' (boom'n'tizz) tendencies	61.5 x 26 x 32cm stands in plenty of free space	88dB/w 30Hz (in room)	R	78
Sony APM-181ES £300	Very Good Average	Big and beefy but equally fat and bass heavy, this well engineered 3-way has notable strengths but lacks transparency and sounds better at lower levels	57.5 x 29 x 36cm low stands, free space	87dB/w 40Hz		71
Sony APM-66ES £700	Average + Average +	Powerful heavyweight sound with a brilliant midband - clear articulate and transparent. But bass is on the boomy side and the treble can sound grainy	66 x 38 x 36.5cm low stands, free space	89dB/w 60Hz		59
Spendor SP1 £800	Very Good Good	A very subtle and musical performer that works particularly well with digital material. An exceptional allrounder	63.5 x 29.5 x 30.5cm stands, free space	87dB/w 41Hz	R	60
Spendor SP2/2* £500	Very Good Good +	Conceding little to the SP1, this 30 litre model displayed good tonal balance with a highly articulate midrange, only slightly marred at frequency extremes	50 x 25 x 30cm stands, free space	87dB/w 45Hz	R	59
Spica Angelus £1295	Good Average	A little bass shy and soft in the bass and lower mid, the free standing Angelus is otherwise tidy, extremely lively and fluid, if uneven overall	116.8 x 53.3 x 26cm away from walls	86.5dB/w 50Hz		60
Spica TC50 £599	Good - Good	This triangular-profile 'groun up' miniature is a shade boxy and laid back but has good rhythmic and musical integrity	40.5 x 33 x 29cm stands in open space	88dB/w 55Hz		71
Spica TC50SE £799	Good - Good	A heavily UK-modified TC50, the SE sounds less boxy and more spacious, but lacks some of the urgency of the standard model	40.5 x 33 x 29cm stands in open space	88dB/w 55Hz		71
Studio Power DMS100 £249	Average + Average +	Close to a BB rating, and in many respects remarkable value for money. Delivers an impressively smooth and large sound, but sheer ugliness will limit its appeal	51 x 26 x 32cm open stands 1ft from wall	86dB/w 25Hz (in room)	R	82

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■ MODEL ■ PRICE	■ LAB ■ SOUND	■ COMMENTS	■ SIZE ■ PLACEMENT	■ SENSITIVITY	■ VALUE	■ ISSUE
Tannoy DC1000 £200	Average Average -	The smaller of two DC models with dual concentric drivers, the '1000 is much less well balanced than the larger, floorstanding '2000	50 x 24 x 25cm	91dB/w 53Hz		71
Tannoy DC2000 £330	Good Good	Remarkably high sensitivity from unique dual concentric driver that has an involving but characteristic sound. Bass could be better	68.5 x 26 x 27cm floor in free space	93dB/w 55Hz	R	66
Tannoy DC3000 £650	Good Good	Giving new meaning to terms like dynamic range and headroom, the magnificent '3000 is a must for those who enjoy high-level monitoring. But spare a thought for the neighbours	94 x 26 x 31cm Floor 1ft+ from wall	94dB/w 30Hz (in room)	R	78
Tannoy E11 £130	Average Average -	Fundamentally turgid and slow, thanks to leaden upper bass and 'shut in' treble, though stereo images are convincing, as are the reasonably uncoloured vocals	39 x 21 x 22cm stands, free space	87dB/w 45Hz (in room)		82
Tannoy E11LE £150	Average + Average	Limited luxury edition of E11 is a total contrast - sonically good in parts, but tricky to optimise in set-up, and rather presence forward. Good material value	39 x 21 x 22cm stands quite close to wall	87dB/w 30Hz		90
Tannoy M15 £180	Good Average +	Somehow lacking the magic of its predecessors, the M15 remains a fine value compact that needs careful set-up to give optimum results	50 x 25 x 21cm Blu-tack to stands 1-2ft from wall	88dB/w 40Hz (in room)	R	78
Tannoy M20 £250	Good Good	Alongside fine build and presentation, the M20 provides an unusually clever combination of the 'traditional' virtues of transparency and low coloration with more trendy strengths of speed and pace	50 x 25 x 22cm stands in free space	87dB/w 25Hz (in room)	R	86
Tannoy Westminster £3600	n/a Good +	These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge, flat against rear wall, away from corners	96dB/w (manuf.)	R	Coll'87
TDL Monitor £1799	Very Good Very Good	Fine solidity and good accuracy, with enough bass extension to satisfy even organ freaks. Needs a big room and can sound a bit lazy and a shade tinkly	118.5 x 30 x 47cm 0.5m from walls	85dB/w 30Hz	R	66
TDL Studio 1 £599	Average + Good	Delivering genuinely extended bass from a compact floorstanding enclosure, the Studio is very detailed but a shade clinical and detached in presentation	76 x 23 x 33cm	84dB/w 25Hz (in room)	R	78
Technics SB-CS5 £70	Average Average	Clearly fine material value for money, the CS5 nevertheless betrays its midi system heritage, the quest for size for its own sake compromising the performance of both enclosure and main driver	42.5 x 25 x 24cm Stands in free space	86dB/w 48Hz	R	86
Technics SB-RX50 £500	Very Good Average +	With its unique coaxial drive unit the RX50 proved a smooth and well balanced loudspeaker, its minor weakness being a mildly excessive low bass	48 x 30 x 26cm free space on 40cm stands	86dB/w 40Hz	R	46
Technics SBC 250 £140	Average + Average -	Despite a fairly even tonal balance, the 250EK sounded muddled in the midrange and dull in character	36.5 x 23.5 x 20.5cm free space, stands	86dB/w 60Hz		46
Toshiba SS33-M £100	Average Average	A benchmark for budget loudspeakers, this Toshiba-inspired but UK manufactured model is a lot of loudspeaker for the money, if a shade on the cheap	40 x 26 x 21.5cm stands in free space	86dB/w 55Hz	BB	68
Townshend Glastonbury IIS* £1700	n/a Very Good	What? No bass? Actually, like the KEF 107, Glastonbury II goes down so low you might not notice how good it is. A truly remarkable performer. Superb soundstaging	91.5 x 28 x 4.6 free standing in room corners	88dB	R	65
Townshend Glastonbury Tor £1495	Average - Very Good	Prodigious bass extension, stunning stereo focus and low cabinet coloration, but limited loudness from low sensitivity and power handling, and some imbalance coloration.	99 x 26.5 x 33cm well clear of walls	82dB/w below 20Hz	R	90
Vandersteen Model One £1000	Average + Average +	This compact American floorstander's elegant staggered baffle arrangement contributes to a refreshing freedom from boxiness, but the price is quite high in view of the additional mid forwardness and bass imprecision.	100 x 30.7 x 25.6cm floor clear of walls	87dB/w 23Hz (in room)		86
Videotone Minimax 2 £80	Poor Average -	Cheap in build and QC as well as price, but cheerful (if coarse) with it - if a little too cheerful after extended listening	27.5 x 17 x 20cm near rear wall	84dB/w 90Hz	R	74
Visonik David 6001 £173	Average - Poor	Sharp styling a classy looking miniature makes, but the complex grillework worsens a sound which starts off with too much top and not enough bottom	20 x 12 x 13cm against rear wall	87dB/w 130Hz		74
Wharfedale 410 £130	Good Average-	One step up from the Diamond, this attractive and sensitive small bookshelf model sounds smoother but is also rather bland and uninvolving	34.5 x 22 x 22.5cm stand against wall	89dB/W 45Hz (in room)		94
Wharfedale 505/2 £190	Average Good	This lively Wharfedale provides plenty of speaker with unusual refinement for the money, and should be fairly tolerant of room siting	44 x 25.5 x 24cm stands 1ft from wall	86dB/w 55Hz	BB	66
Wharfedale Coleridge £499	Average Good	Compact, beautifully finished and extravagantly engineered box sacrifices bass extension in the cause of high midband sensitivity; communicative, but can be a little unforgiving	48 x 26 x 26.5cm stands 1ft from wall	91dB/w 48Hz (in room)	R	82
Wharfedale Diamond IV £109	Good Average +	Thanks to a new metal dome tweeter, the new Diamond is much more civilised than its predecessors, with an attractive lively bounce but some boxiness	27 x 18 x 18.5cm stands close to wall	86dB/w 48Hz	R	90
Yamaha NS 1000M £900	Good Good +	Living up to its monitor label, and tonally well suited to digital material, the NS 1000M is superbly crafted and capable of high levels	67.5 x 37.5 x 32.5cm 30cm from wall, stands	90dB/w 40Hz	R	46

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CASSETTE DECKS

The bad odour of copyright theft hangs around the compact cassette, but there is no doubt it is the world's most versatile and ubiquitous music storage medium. Hi-fi buffs may wrinkle their noses pointedly, but are still happy to use cassette decks to make up tapes for the car or personal – at the same time complaining loudly about the quality of pre-recorded material. (In fact the very best decks can do a surprisingly good job with musicassettes.)

There is no problem in connecting a cassette deck to any normal amplifier, but some care needs to be taken in choosing the best tapes for a

specific machine. (Trial and error is one effective technique, but many decks have manual bias adjustment and some match up to the tape automatically.)

Lab performance and sound quality often go hand in hand, and are frequently somewhat dependent upon factory alignment. The mechanical integrity of the mechanism itself is another crucial factor, that is often reflected in the asking price.

All modern hi-fi decks have Dolby B and the majority have Dolby C besides; the very worthwhile HX Pro system is becoming steadily

more widespread. Remote control remains rare, though sometimes it is available as a system option.

Three-head recorders allow simultaneous checking of the recording being made. Auto-reverse is a useful convenience feature, but usually with some mechanical compromise, while double-mechanism 'dubbing' decks of dubious quality are fashionable at the bottom end of the market. The welter of different 'music search' systems available is some indication of their frequent ineffectiveness

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Acoustic Research RD-06 £280	Average Average	Acceptable middle market player with very simple facilities and cramped control section, but unusually good looks	Dolby B/C/HX Pro, fine bias, counter memory, repeat		69
Aiwa AD-F270 £90	Average Average	An excellent budget machine, adequately equipped and satisfactorily built. Sound quality is in severe danger of transcending the price category	Dolby B/C, fine bias adjust	BB	75
Aiwa AD-F370 £130	Average Average	Adequate but uninspiring recorder with detail shortcomings but good control layout and successful sounding with recorded musicassettes	Dolby B, C, HX Pro, bias adjust		63
Aiwa AD-F500 £150	Average Good	Noise levels are a little higher than usual, but sound quality is otherwise very good - open, explicit and very neutral tonally.	Dolby B/C/HX Pro, cue/review, fine bias, record sensitivity adjust	R	93
Aiwa AD-F700 £199	Good Average	Somewhat less than the sum of the (most fine) individual parts, this deck has an artificial quality which spoiled the efforts of a fine transport	Dolby B/C/HX Pro, fine bias, CD Direct input		75
Aiwa AD-F800 £249	Good Very Good	Close to first class performance – and superb value. The Aiwa is purposeful and finely engineered. It provides a near irresistible blend of good mechanics and electronics	3 head, dual capstan, Dolby B/C/HX Pro, tape calibration	BB	75
Aiwa AD-R470 £150	Average Good	For once, an auto-reverse deck with the performance of a decent uni-directional one at a similar price. The Aiwa is modern in concept, and has good, transparent electronics	Dolby B/C/HX Pro, auto reverse, cue & review, bias adjust	BB	69
Aiwa AD-WX616 £150	Poor Poor	Sonically sub-standard twin transport deck which has sensible range of well implemented features, yet which sounds compressed and uneven.	Twin full logic, 1 records, Dolby B/C track search		93
Aiwa AD-WX777 £179	Very Good Very Good	Excellent, middle price dual deck with quick side change and a living, breathing sound – though prerecorded tapes sound bright	Twin auto-reverse, one records. Dolby B/C, fine bias	BB	75
Aiwa AD-WX888 £249	Good Good	Inaccurate set-up spoils metal tape operation, but with other tapes the deck works well. This deck offers fine engineering, facilities and sound	Dual auto-reverse twin deck, Dolby B, C and HX Pro	R	75
Aiwa AD-WX909 £400	Good Good	Convenience meets sound quality, and both win. An essentially clean, positive recorder which works alongside an auto-reverse player of lower standard – a sensible compromise	Dual deck, auto-reverse, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57
Aiwa XK-007 Excelia £400	Good Good	Downmarket version of XK-009 with simplified bias/equalisation adjustment section and more forgiving but less informative sound. Still good, but less exciting than XK-009	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment		63
Aiwa XK-009 Excelia £550	Very Good Very Good	Excellent detail, stable articulate midband and slightly obvious treble. The most interesting Aiwa for yonks	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment, CD direct	R	63
Akai GX-32 £170	Average Poor	Constrained and smeared sum up this deck well. It has poor bass and treble definition alike, though it proved well aligned for prerecorded cassettes	Dolby B/C, variable bias, headphone out, track search		69
Akai GX-52 £250	Very Good Very Good	Well finished and a pleasure to use, this well specified deck sounds clean and defined with all tape groups, with or without Dolby	Dolby B, C, HX Pro, track locate features	BB	57
Akai GX-65 £300	Average Average	Fine ungimmicky middle ranking deck with simple, purposeful controls, works best with metal tapes. Performance standards fair to good	3-head, dual capstan, Dolby C/HX Pro		87
Akai GX-95 £400	Good Very Good	Well designed and finished cassette deck with features well judged to please the audiophile – especially switchable Dolby HX Pro and switchable panel display. The calibration system is simple and effective, and the deck sounds great	Dolby B/C/HX Pro, 3 head, manual R tape set-up	R	69
Denon DRM 700A £150	Very Good Very Good	Simple but adequate features, lacks only timer standby. Musically this deck equals the best at this price level despite some clouding of transients with Dolby B.	Dolby B/C/HX Pro, fine bias, 3 heads, record return	BB	93
Denon DRM-400 £140	Poor Poor	Messy, confused sound terminally lacking in detail and space under all conditions of use due to high mechanical flutter levels	Dolby B/C, memory stop, track search		81
Denon DRM-500 £180	Good Very Good	Powerful, refined and detailed sound, and an excellent transport are keys to the success of this cleanly styled addition to the range – but why no timer standby?	Dolby B/C/HX Pro, variable bias	BB	75
Denon DRM-700 £250	Good Very Good	Sloppily executed (though attractive) user interface contrasts with a high standard of music making belying its modest price	3 head, Dolby B/C/HX Pro, record return	R	81
Denon DRM-800 £330	Good Very Good	There are some niggling faults and limitations (no timer standby is particularly annoying), but as a means of recording music it sets a very high standard	Dolby B/C/HX Pro, off tape monitoring, dual capstan	R	75
Denon DRW-650 £200	Average Average	This simply equipped model is a little fiddly to operate at time, partly because of the way the single set of transport keys is assigned. But sound quality is generally workmanlike – good value	Twin transport, Dolby B/C/HX Pro	R	93
Denon DRW-750 £250	Good Good	Polished and articulate, the only significant shortcoming is poor performance with prerecorded material	Dolby B/C/HX Pro, twin unidirectional, one records	R	69
Dual 5850RC £269	Poor Average	Average-to-middling deck which does most things well and skates over the more subtle things. Control system is uninspired but easy to master. Overpriced	Dolby C/HX Pro, bias adjust		87
Goodmans GSW-5200 £90	Poor Poor	Musically unimpressive but at least it's cheap!	Dolby B, twin, one records		69
JVC TD-V621 £300	Very Good Good +	Sharp, stable sound with rock solid transport. Features count is extensive and useful. Only raw sounding electronics detract from the scoring.	3 head. Dolby B/C/HX Pro, 3 inputs, fine bias	R	93
JVC TD-X321 £130	Average Average	Typical modern budget deck with acceptable sound quality, especially when making and playing it's own tapes. The transport is a little rough, but recommended on the basis of good value for money.	Dolby B, C & HX Pro	R	93
Marantz CP230 £330	Average Average	This is a competitively priced portable recorder though not suited to replay of musicassettes	Dolby B, bias adjust	R	52
Marantz CP430 £400	Average Average	Uniquely flexible and compact package for outside work which at a pinch can double as a domestic cassette deck. dbx is useful for location work; results with Dolby B are acceptable	Portable 3 head, dbx, fine bias, charger/adaptor	R	87
Marantz SD-40 £170	Average Very poor	Obstructive aesthetics are offset by apparently good build and sensible features, but sound quality is uneven or worse.	Dolby B/C/HX Pro, fine bias	R	93
Marantz SD-50 £220	Good Very Good	Fine, exacting all-rounder offering good stereo, precision and focus. Good with prerecorded tapes too.	Dolby B/C/HX Pro, track & intro search, variable bias etc	R	81
Marantz SD-60 £350	Good Very Good	A first rate, highly capable deck offering energetic yet refined sound largely due to good electronic design	3-head, Dolby B/C/HX Pro, variable bias & sensitivity	R	81

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CASSETTE DECKS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Marantz SD315 £180	Average Average	Sound quality is promising, but somewhat offset by 'shut in' top end. Pitch integrity suspect Dolby C sound quality and dubbing performance poor	Dolby B/C/HX Pro, twin transports, one rec/play, one play only. Mic input		93
Marantz SD515 £350	Poor Poor +	Good electronic design is let down by mediocre alignment and poor transport stability. Disappointing at the price.	Twin auto-reverse, both transports record, Dolby HX Pro, parallel record capable	R	93
Memorex SCT-5 £150	Poor Poor	Poor example of a twin cassette deck where everything has been sacrificed on the altar of flexibility	1 rec/play, 1 play only transport, Dolby B/C		87
Memorex SCT-84 £200	Average Average	The playback only transport is a little disappointing, but the record one is a quality item and the deck works well. Ergonomics are good, but styling and control feel are decidedly tacky.	Dolby B/C, fine bias, twin deck with auto-reverse record, unidirectional play	R	69
NAD 6300 £550	Very Good Very Good	Solid and homogeneous sound quality and very good replay compatibility thanks to 'play trim'. Distinctive, musical — and costly	Dolby B, C, HX Pro, 3 Head, bias adjust	R	63
Nakamichi Cassette Deck Two £300	Very Good Very Good	Not completely neutral, this deck is assured, dynamic and quick, with abundant detail and some coarseness. Stable transport but only rudimentary features accompany fine engineering	Dolby B/C, manual tape type selection, bias adjust	R	93
Nakamichi RX-202E £545	Good Very Good	Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control	Auto reverse, Dolby B, C, 2 head	R	63
Philips FC566 £179	Average Average	Mostly well equipped, though some tape search facilities fail to exploit the auto-reverse capability. Sounds clean and stable — with prerecorded tapes too	Auto reverse, track search, Dolby B & C		57
Philips FC567 £279	Average Poor	Well equipped but ergonomically substandard; sound quality is messy and lacking in clarity and dynamics	Dual deck, auto reverse, track search, Dolby B & C		57
Philips FC870 £250	Average Average	Disappointing at the price, this is a well equipped deck with off-tape monitoring, but a somewhat listless, smeared musical style	Dolby B/C/HX Pro, 3-heads, track/intro search etc		81
Pioneer CT-225 £99	Poor Poor +	Budget deck with a strictly budget sound — but surprisingly strong range of features. An opportunity lost.	Dolby B/C, logic controls, track search		93
Pioneer CT-337 £130	Average Average +	Simple but well made machine with a slightly soft but consistent standard of reproduction	Dolby C/HX Pro, CD synchro, mic inputs	R	87
Pioneer CT-447 £170	Good Good	An excellent and affordable package, decidedly OTT in the display area but capable of genuinely fine musical reproduction	Dolby C/HX Pro, auto tape alignment, track search	BB	87
Pioneer CT-656 Mk II £250	Average + Average +	Reworking of original 656 has led perhaps unintentionally to a somewhat ill-conceived set of compromises. Excellent with prerecorded material, the deck is otherwise unbalanced.	Dolby B/C/HX Pro, 3 heads, track search, fine bias		93
Pioneer CT-757 £350	Very Good Poor	Ostensibly fine deck is let down by inability to drive tape hard without loss of focus and consistency. Even prerecorded material, which didn't suffer these shortcomings, lacked detail.	Dolby B/C/HX Pro, 3 head, assisted tape calibration		93
Pioneer CT-91a £500	Very Good Very Good	Superb, near state of the art recorder with an excellent dual capstan transport and very capable electronics. At the price, this one is a mould breaker	3-head, tape calibration, Dolby B/C/HX Pro	R	75
Pioneer CT-959 £450	Very Good Very Good	Near state of the art for £450. Engineering is of a high order. An open window sound quality, but playback response is very bright (being corrected by manufacturer)	3-head, var bias & eq, multi-mode meters. Dolby HX Pro	R	87
Revox B215 £1727	Very Good Very Good	Fine, consistent and solid sound quality, with excellent under the skin engineering and many useful features — but you're also paying for the same	Dolby C/HX Pro, 3 heads, dual capstans, auto tape align	R	87
Revox B215-S £1826	Very Good Very Good	This is a superbly engineered deck with a classically fine performance that almost transcends the stereotypes. Ergonomics are flawed but the user interface is both powerful and flexible	3-head, dual capstan, Dolby B/C/HX Pro, auto calibration	R	75
Rotel RD-845 £130	Average - Average +	Extremely fine transport and clean sounding electronics for the price. Bass lacks weight, but deck works remarkably effectively with chrome tapes.	Dolby B/C, manual tape selector	R	81
Rotel RD-855 £180	Average Good	The transport is OK and the various frequency responses are erratic, but good basic electronics help the Rotel deliver. Coherent, enjoyable and informative	Dolby C memory stop & repeat, track search	R	87
Rotel RD-865 £200	Good Very Good	Fine, architecturally solid sound quality in a package with a low gimmick count and strong audiophile appeal	Dolby B/C/HX Pro, fine bias	BB	75
SAE C102 £549	Average Good	Looking most unlike a cassette deck designed in the States and proving competitive in its price group. Not sonically that outstanding, however	Real-time counter, track search, Dolby B & C		52
Sansui D-X211HX £170	Good Good+	Clean, stable and open sounding recording quality distinguishes this player, — and auto-reverse too. A great improvement on earlier mid price Sansui models, and excellent value.	Auto reverse, Dolby B/C/HX Pro, bias adjust	R	93
Sansui D-X301i £180	Average Good	Lively, informative and well equipped basic deck, if rather obscure operationally	Dolby B/C/HX Pro, variable bias, track search	R	69
Sansui D-X501 £230	Poor Poor	Unhappy mixture of good looks, excellent ergonomics and mediocre, sometimes poor sound	Dolby B/C, random track search		81
Sansui D-X701 £340	Average Average	A little flat and smeared under some conditions, this design is at its best with metal and prerecorded tapes	Dolby B/C, 3-head, variable bias & output, track search		81
Sherwood DS-1135C £100	Average Average	Excellent value. There is a low level constant background drone, and Dolby C recordings sound flat and coloured. Elsewhere sound quality exceeds expectations	Dolby B/C/HX Pro	R	87
Sherwood DS-7000R £230	Average Poor	Rough and ready cassette deck in which sound engineering has been sacrificed on the altar of extra selling features, namely three heads for real time off-tape monitoring	3-head Dolby B/C/HX Pro		87
Sony (WMD6C) Pro Walkman £249	Good Very Good	One of the finest sounding cassette decks on the market today. A mandatory Best Buy, which also fits in your pocket	Dolby B, & C	BB	60
Sony TC-FX120 £90	Poor Poor	Neat and very simply equipped model has decent electronics but poor, unstable transport with predictable consequences.	Dolby B & C, variable bias		93
Sony TC-K520 £170	Average Good	Fine, assured and detailed performer with a very well designed and straightforward user interface	Dolby C/HX Pro, variable bias, display on/off	BB	87
Sony TC-K650ES £250	Average Average	Facilities are utilitarian but nicely presented, but sound quality, which is basically good, is slightly marred by some coarseness of tone.	3 head, Dolby B/C/HX Pro, fine bias	R	93
Sony TC-K730ES £500	Very Good Very Good	First rate cassette deck that scarcely betrays it is a cassette deck on audition. Features and control wise, it feels a little dated	Dolby B, C, bias and equalisation adjust	R	81
Sony TC-K850ES £400	Very Good Very Good	Near state of the art recorder with excellent recording quality, and even better playback performance. Sounds — and looks — best with the display turned off	3-head, Dolby HX Pro, bias/level adjust, dual capstans	R	87
Sony TC-RX110B £90	Poor Poor	Woolly bass and scrappy treble combine to make a meal of many music types, despite accurate response shapes with most types of tape. Prerecorded material sounds dull	Dolby B/C		75
Sony TC-TX55 £150	Average Average	The sound quality ranking is a good one for an auto reverse machine at this price level. Clean, sharp sound, only slightly let down in the deep bass.	Auto reverse, Dolby B, C & HX Pro	R	75
Teac V-270C £89	Average Average	Not quite cheap enough to compete solely on price, the V-270C is a rather messy and unstable sounding deck	Dolby B & C, bias adjust		63
Technics RS-B905 £350	Good Good	Good, well set up cassette deck with a clean, accurate sound but some compression. dbx circuit sounds poor	Dolby B, C, HX Pro, dbx, bias adjust, 3 Head		57
Technics RS-B965 £350	Very Good Very Good	Messy control layout, but ultra capable deck with clear electronics and excellent headroom, low noise, an ultra-stable transport — and first rate sound quality.	3 head, dual capstan, Dolby B/C/HX Pro, dbx, assisted tape alignment.	R	93

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CASSETTE DECKS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Technics RS-TR355 £200	Average	Serviceable middle market dual deck without serious fault but with some annoying inadequacies, notably an inability to play side A and B and then stop	Twin auto-reverse, one records, Dolby B/C/HX Pro		75
Yamaha KX-1200 £500	Excellent	A veritable rats' nest of buttons and dials, albeit well laid-out. This is nearly a great recorder, but lacks simplicity of sound	Real-time counter, track search, Dolby B, C, dbx, HX Pro, bias adjust, remote control		52
Yamaha KX-250 £150	Good	Excellent if somewhat fiddly deck with all mod cons. Play trim helps bring recalcitrant tapes back into line. Refined, expressive sound quality and stable transport	Dolby B/C/HX Pro, Intro Scan, Play Trim	BB	93
Yamaha KX-330 £170	Average	The first portable DAT recorder, and already looking expensive and a little under endowed. Cramped control panel but a strong, dynamic and comparatively stable performance distinguishes this strong middle-price deck	Dolby C/HX Pro, optional remote control	R	87
Yamaha KX-530 £230	Good	Excellent all-rounder that does most things at least competently and many things well. One of the best middle price decks	Dolby C/HX Pro, 3 motors, optional remote control	BB	87
Yamaha KX-930 £400	Good	Worthy but ultimately slightly disappointing mixture of fussy ergonomics and tidy but cluttered sonics	3 heads, dual capstans, Dolby C/HX Pro, remote control		87

DAT RECORDERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa Excelia XD-001 £1300	Very Good	Clear and very listenable recorder, roughly comparable to, but slightly sweeter sounding than Sony DCT-1000ES - but with an inferior front panel design	Track ID and search, remote	R	63
Aiwa HD-S1 £600	n/a	The first portable DAT recorder, and already looking expensive and a little under endowed. Nevertheless, good build, controls and display help, and sound quality is adequate.	DAT recorder with separate A/D converter/battery unit. SP only, mic/line i/p		94 Supp.
Denon DTR-2000 £800	Good	Not cheap, but first rate DAT recorder, good to excellent fidelity in all modes, with a slightly cool detached quality when differences are detectable.	Digital LP/digital & analogue SP record/play, LP analogue play only, digital fade, fine cueing, remote	R	93
Grundig Fine Arts DAT-9000 N/a	Good	Conventional DAT recorder offering standard facilities. The deck is well made and equipped, and is engineered to a satisfactory quality standard. It performs to an acceptable standard, though it is not state of the art.	2/4 hour recording, mic inputs, digital in/out		69
Kenwood DX-7 £450/£150	n/a	Sound quality is pretty fair, but a little rougher than the best of the breed. Controls are good, the display however is poor - and most users will require the accessory pack	AC powered recorder, no analogue LP mode. Optional accessory packs adds battery/ADC & case		94 Supp.
Luxman KD-117 £1499	Good	Slightly soggy, earth-bound sound quality, this model trails the other DAT decks tested so far	Two analogue inputs, remote twin address		63
Sony DTC-1000ES £1299	Very Good	Only available from professional outlets. Fine, consistent performer with accomplished tape handling and good build quality	Standard track ID and search, remote	R	63
Sony DTC-55ES £550	Very Good	Broadly comparable to a middle ranking CD player sonically, the Sony is particularly well equipped and well priced.	DAT with all record modes, inc LP (analogue) record	R	93
Sony DTC-M100 £799	Very Good	Only available from professional outlets. Clean clear sounding second generation model with most of the features and sound of the DTC-1000ES	Mid-width, alpha-numeric display, remote, optical interfaces	R	63
Sony TCD-D3 £500	n/a	Compact, well equipped, easy to use and excellent sound, it undercuts rivals by a clear £100	DAT recorder, detachable rechargeable power pack, LP/SP record modes	BB	94 Supp.

CD PLAYERS

Now entering its second decade, this all digital music source is well established despite high disc prices and the opposition of many hi-fi enthusiasts. Compact Disc's strengths over conventional vinyl are complete freedom from surface noise, ease of use, and more robust software. Remote control is just about standard on all new players.

However, many vinyl enthusiasts find CDs

sound less involving than top quality vinyl.

Prices average out at a little over £200, although entry level models are now available for little more than £100. Even the most basic models can sound very good indeed and employ state of the art decoding chips and the most useful play features. Extra money can buy remote volume control, audio 'tweaks', plus improved build and component quality control.

Digital outputs facilitate an easy upgrade path.

Machines can be split into bitstream and multi-bit with each school having its adherents. Bitstream is the newer technology and will probably win in the end, although the development time spent on multi-bit systems means that excellent results can still be obtained.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa XC-007 £499	Very Good	Creditable sound despite inverted output, high tech engineering with very good lab performance. A worthy contender but not cheap	Remote, keypad, timer, digital output, pseudo 20 bit, dual DAC		64
Aiwa XC-333 £149	Average - Average	Looks costly, well featured, well balanced technical performance and sound for money	multi bit, keypad remote, hdph (fixed)	R	88
Akai CD-52 £249	Good	A nice surprise from Akai, genuinely good sound from this mid-priced model. Better linearity will help further	Remote, digital output, headphone socket	BB	64
Akai CD-55 £230	Good	Budget model which fails to compare with the CD52	Remote, hdph, Good programming		83
Akai CD-62 £330	Average	Looks, build quality and the technical specification are right up to date. As it stands it sounds very good but if the indifferent lab performance could be improved, it would probably sound even better	Remote, programme, hdph, comprehensive display etc	BB	70
Akai CD-73 £450	Good	A little uneven musically, the Akai tends to smother fine detail, but has first class dynamics and stereo imagery. Worth auditioning	Track entry keypad remote, menu display (switchable)		62

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CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Akai CD-93 £700	Good Very Good	Undoubtedly a CD player of real class in build, presentation, lab performance and sound quality, but also a shade expensive for formal Recommendation - though that's not to dissuade - lovers of black lacquer wood finish	Track entry remote, menu display etc.		58
Arcam Alpha £400	Very Good Very Good	Arcam's new star, its best CD player yet and great value	Remote, etc, coax dig. out	BB	83
Arcam Black Box 1 £200	n/a Very Good	This rich, powerful and articulate sounding DAC transforms the majority of medium price CD players	Needs D-out CD players	R	60
Arcam Black Box 2 £250	Very Good Very Good	An addition to the BB 1, it also offers improved sound and more inputs	Optical and wired input digital decoder	BB	76
Arcam Black Box 3 £350	Good + Very Good	Top of a series of three decoders it can offer a high sonic standard with top class transports	Bitsream, auto input switching, optical & coax	R	88
Arcam Delta 170.2 transport £600	Very Good Good	An upgraded Delta transport, it sounds different but not really better. More research is required here	Transport only, display off, usual programming		88
Arcam Delta 70.2 £600	Very Good Good	Now in Mk II form a further improvement is seen in features, performance and sound quality. Solidly built and British	Now adds simple remote vol + std features; also display off	R	76
Ariston CD1 £345	Good Good	Easy on the ear compact disc for those who like their music Radio 2 flavoured. And it looks good	digital output, remote control	R	87
Cambridge Audio CD3 £649	Poor Good +	Unique internal configuration gives the CD3 a fluid and detailed sound falling off at the frequency extremes. The controls and displays are primitive	Optical/electrical digital out, remote control		87
Carver TL-3100 £340	Average Average -	The sound quality did not live up to the excellent fascia. Carver's DTL did not aid the indifferent sound	DTL sound shaping, usual facilities, remote, memory		76
Carver TL-3300 £695	Good + Poor	Carver needs to listen critically to CD sounds; in our opinion, DTL does not improve the recipe	DTL, remote, programming, digital output		83
Conrad -johnson DFI £1995	Average - Good +	Setting a decent standard and including an FET line preamplifier, the unusual DFI is worth investigating	Line preamp built-in, simple remote facilities		76
Deftec PDM-One £500	Average Very Good	A no frills audiophile bitsream converter at an affordable price	Coax-in, special cable and mains filter options	R	83
Denon DCD 960 £300	Good + Average	A fine feature package with good lab results, but unfortunately an unexceptional sound quality	Remote inc vol, hdph, keypad, well featured		88
Dual CD5150 £280	Very Good Good +	In a real sense cloned from the rave Rotel RCD-855, this is also a great value all rounder: multi bit rules OK!	keypad remote, hdph (fixed), Philips based	BB	88
Ferguson CD007 £130	Good Average	The cheapest recommendation in the test group; don't expect the earth but the value is good	Manual, digital output, headphone socket	R	64
Ferguson CD008 £150	Average Average	Not as strong as its relatives, sample fault perhaps? Though performance is fair enough overall	Remote, midi digital output, 2x O/s, timeshare 16 bit		64
Goodmans GCD-435 £140	Poor Average -	Goodmans has the power to source with more care than this, music centre quality!	multibit, remote, basic facilities		88
Grundig CD9000 £1000	Good Good	Aimed at a market which puts external styling above sound quality. Although this player is of slightly above average competence, in most departments it is expensive	Remote, programme, hdph socket, calendar display etc		70
Harman Kardon HK7300 £200	Average Average -	Budget low bit technology, does not deliver enough for a recommendation	No remote, no digital out; basic control features		83
Harman Kardon HK7500 £330	Average + Average	Decided improvement over 7300 in all respects. Still fairly unimpressive sound	Remote, hdph + vol, good programming		83
JVC XL-V231 £149	Excellent Average -	Text book lab result but below par sound, nice and boring. Must be some potential here	Remote, hdph (fixed), JVC 1-bit PFM		88
JVC XL-Z1010 £499	Good Average -	Despite some high tech design and a good lab result, this model did not deliver good sound quality	32 track prog., disp. off, auto fade, 2 digital op		76
Kenwood DP-8020 £500	Excellent Very Good	Fine build and finish, a fine performer in the lab, and in sound quality	Comp. remote, opt & coax dig. output, versatile	R	83
Luxman D105u £699	Average Average	Visible valves are essentially for show in this rather ordinary player - both sound and lab	"valves", remote inc vol, hdph, well equipped		88
Marantz CD-40 £200	Very Good Good +	Like the Philips CD620 equivalent, this is the Philips/Marantz performance/value equation at its best	Multi bit, remote, hdph (fixed)	BB	88
Marantz CD-50SE £330	Very Good Very Good	Souped up CD50 delivers reference performance in its class. Worthy successor to the '65SE legend	Full remote, power volume. Hdph, (fixed), FTS. Good programming	BB	83
Marantz CD-60 £330	Very Good Very Good	Lacking the SE flair, the 0 remains a fine player by market standards. Second best is more than good enough	Multi bit, remote inc. vol., hdph, FTS etc	BB	88
Marantz CD-60SE £380	Very Good Very Good	Luxury '50SE with superior remote volume and variable headphone socket; a fine performance all round	Optical digital output, full remote, power vol. FTS, hdph	BB	83



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The Directory

CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Memorex CD1650 £200	Poor Poor	An overpriced music entre player. Surely the giant Tandy corp. can get a better standard than this?	remote, keypad, multi bit, midi		88
Meridian 203 £495	Very Good Excellent	Exceptionally lucid, transparent and solid sound 'bitstream' converter. Always tidy and easy on the ear, but doesn't bulldoze the craggy bits	Stand alone converter, 32-48kHz, optical/electrical i/p	BB	87
Meridian 206B £950	Excellent Excellent	What a stunner! Audiophile quality from the reference one box CD player, and at a most realistic price	Differential bitstream, keypad remote, prgming	R	88
Meridian 208 £1575	Excellent Excellent	State of the art CD sound combined with a decent preamp and full remote control	Hdph + remote level. Programming, R phase invert, various outputs		83
Micro Seiki CDM100 £3850	Very Good Good	One of the hernia inducing bricks of hi-fi, the Micro is extravagantly styled, finished and built. The good lab performance led to an 'only good' sonic display when the price demanded an excellent	Balanced output, remote, display blanking		72
Micromega Duo BS £499	Good Excellent	With a good transport it delivers a sweet musical sound at a high quality level	Bitsream D/A convertor, auto input switching	R	88
Micromega Optic BS £695	Average Good +	A bitstream rebuild of a Philips chassis, this player shows promise for the future	Bitstream, remote, hdph (fixed)		88
Mission Cyrus PCM II £400	Very Good Good +	Improvements in price and performance keep this classic remote player in the running	Remote vol, phase inv, dig op. PSX option	R	83
Nakamichi DMS-5EII £1500	Good + Very Good	". . . delivers near state of the art performance and build quality in a deliberately starkly functional package, but at a very high price . . ."	Skip and scan, simple track programming, I		51
Nakamichi DMS-7EII £2000	Good + Good	The only serious criticism here is of the price. And in our opinion you can get better sound quality for less elsewhere in Nakamichi's range	10 digit track entry programming, hdph		51
Philips CD 850 £400	Very Good Very Good	An upgrade of the 840, Philips has got bitstream to work well here. A fine allrounder	Bitstream, keypad remote, FTS etc, etc	BB	88
Philips CDV185 £350	Average + Average	Hard to value with the video singles facility but it all works well enough for a recommendation	Video singles + CD scart + digital out etc	R	76
Pioneer PD-7500 £280	Very Good Average	Has potential but has not brought it off on sound. Good aspects of earlier models have been lost with the new technology	Low bit dual DAC, full remote, hdph		88
Pioneer PD-91 £899	Excellent Excellent	Close to state of the art in nearly all areas - soundstaging, clarity and simple lack of artificiality. A well made and sophisticated player	Track entry remote, calendar display	R	64
Pioneer PD-9300 £499	Excellent Average	A mid price flagship of excellent build and lab performance but only average sound - interesting though	Remote, 24 track programming, 2 dig. op		76
Proton AC-120 £180	Average Average -	Fine styling, low price but barely average performance	15 track memory, simple design, remote, hdph		76
Radford DAC1 £895	Good Good	Fine but slightly dated and costly package in performance terms — but flexible, musical and well built	DAC with 2 electrical + optical i/p, tape out		87
Radford WS2* £1095	Good Good	This player fails only in subtle ways. It is not the most engaging of players, but it is strong, forceful and dynamic, and it remains one of the better Philips 16-bit clones	Programming, intro scan etc	R	87
Revox B126 £649	Very Good Good	Made in Switzerland so the build quality and technical performance is high, but then so is the price and the sound quality is only good	Programming, Revox system compatible		70
Revox B226S £840	Good Average	Top quality build and finish for the Revox system enthusiast. For high value sound look elsewhere	Remote vol, hdph, 19 track memory, digital op		76
Rotel RCD-855 £250	Good Good +	Stripped for action, this well built Philips technology player delivers fine performance and sound. First rate value	Remote, 20 track prog, 1 audio output, 1 digital output	BB	76
Rotel RCD-865 £300	Average Good	Curious mixture of bold musical presentation and foreshortened imagery. Grows on you though. One to audition with care	'bitstream', remote control	R	87
SAE D102 £700	Good Good	Considering the high price of this player, most of the innards seem fairly prosaic. Sound quality and lab performance are both respectable enough, but hardly justify the price premium involved, though styling is unusual	Remote (inc volume), skip, scan etc.		58
Sansui CD-X711 £600	Excellent Very Good	Luxury features, finish and sound from this classy Sansui; no excuses required here	Hdph + vol, remote full programming	R	83
Sharp DX150 £129	Average Average	This is one oversampled player which is rather outclassed for technical and sonic merit by the vast majority of the competition. Pretty enough but would you want to put discs in it?	Programmable, skip, search, repeat		70
Sharp DX750 £179	Average Average	It has a remote control but it's too like the 150 which is rather outclassed for technical and sonic merit by the vast majority of the competition	Remote, programmable, skip, search, repeat		70
Sonographe SD1 (by CJ) £799	Good Very Good	Distinctive with oak end-cheeks, using Philips based 14 bit x 4 oversampling, Conrad Johnson electronics make this a musically rewarding player	Full search programme and timing	R	Coll. '87
Sony CDP-228ES £400	Very Good Average +	Good value, this is Sony's best mid price design and comes superbly equipped	Hdph, remote, rem vol, custom file	R	76
Sony CDP-338ESD £600	Excellent Good	Only a bit better than the 228, the 338 is a good machine, but not quite good enough for formal recommendation at the price	Custom file, remote, rem vol, hdph, shuffle etc		76
Sony CDP-790 £200	Good Average	Great on the test bench but new tech sounds worse than its predecessor. Who does the listening?	Low bit, full remote, comprehensive facilities		88
Sony CDP-X7ESD £1300	Good + Average	A Sony flagship, build and finish is exemplary, styling is unusual but the sound is just average	Custom file, remote, 2 digital op.		76
Stax Quattro £2995	Very Good Very Good	Now in mkII guise this substantial player recreated exceptionally strong and convincing bass lines together with a beguilingly musical midband	18-bit DACs, 20-track memory, full IR remote, variable o/p	R	72
Teac CDP-400 £249	Good Average	Fine in the lab, but good build quality is not reflected in the rather average sound	Low bit, keypad remote, hdph, versatile prgm'ing		88
Technics SL-P277A £160	Very Good Average +	High value, budget priced, yet well equipped and finished, a strong example in its group	Remote, programming, hdph + level. No d. op.	BB	83
Technics SL-P550 £220	Very Good Average	Superb, slick presentation, well equipped, average sound, fine build	Hdph, rem. prog., edit/fade, dig. optical		83
Technics SL-PA10 £450	Good + Good	Built to partner the SU-MA10 upmarket integrated amp/DAC, this transport has the unusual limitation of only optical output. Reassuringly solid and more immune to vibration than most	CD transport, optical output only, remote		88
Wadia WT-2000/Digimaster 2000 £5495/£6500	n/a Very Good	Very high grade player which provides state of the art in believable music making from CD, and promises a degree of upgradeability	Transport/multi bit DAC - 32, 44.1, 48kHz o/s		Coll. '90
Yamaha CDX-1030 £500	Good + Average	New tech but Yamaha hasn't managed to get this one sounding right. Otherwise its fine	Low bit, remote with vol, very versatile		88
Yamaha CDX-530E £180	Average + Average	A well balanced example using established DAC technology - worthy of consideration if not recommendation	Multi bit, keypad remote, hdph (fixed)		88

The Directory

CD MIDI SYSTEMS

So you want a hi-fi, but you don't want to make a fuss about it. A pre-packaged system with everything matching up and no aggravation may not rank with carefully chosen separates on sound quality, but there's no denying the attractiveness or popularity of this approach – the market for pre-packaged component hi-fi systems is considerably bigger than that for separate items, even ignoring the vast numbers of low-cost single unit stacker systems.

The arrival of compact disc led to a new

fashion for shelf-standing compact systems, or 'midis' as they are known in the trade, as a replacement for earlier floor-standing rack systems (themselves the upmarket development from music centres). Only some 330mm wide, midis can more or less match full-size (430mm) rack components for performance, and are certainly cheaper to make, ship, sell and buy.

Whereas specialist hi-fi is moving steadily towards ultra-simple 'no frills' components, midi systems tend to be sold on a feature count at a

price point, usually with little opportunity for demonstration and comparison. Our test programme includes extensive auditioning and lab testing, while making allowance for the different aspirations of designers and expectations of users. Key features valued highly by customers include system remote control, automatic switching, and double 'dubbing' cassette decks. The top end of the market is developing with surround sound audio/video-ready packages.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa NSX-800 £550	Average Poor	Undetailed, undynamic and largely unmusical system which throws it all away for an excessive range of tape related features	One box miniature plus remote control & speakers with dual auto reverse cassette mechanisms, mic mixing etc		89
Aiwa X-D100 £1000	Average - Average	Very fully equipped with wide ranging in and outputs but poor upgradeability. Sound quality is reasonable on the whole etc	Digital & optical in/outputs, dual auto reverse, disc file CD		77
Aiwa X-D80K £550	Poor Poor	Congested and harsh sound quality, the cassette deck, amp and loudspeakers being well below par. The built-in timer adds some operational flexibility	Auto-reverse, CD synchro record, remote, timer		77
Akai FX-800CD £700	Very Good Very Good	Well thought through as a functioning system. Lacks the usual surfeit of controls, and sound quality is of an unusually high order. An excellent buy even at this price	Twin record & auto reverse cassette etc with 'intelligent'	BB	89
Ferguson HFD28 £300	Poor Poor	Similar to Goodmans 5000 system but with greater power and marginally superior sound	One-piece, semi-remote		77
Grundig Studio Line 1 £330	Poor Average +	Intriguing package with warm, woolly but attractive sound let down by poor attention to detail and suspect cassette deck. Amplifier appears to be inadequately protected	CD/cassette tuner plus preset equaliser		77
Hinari DK200 Disc Deck £300	Poor Poor	Confused user interface is matched to inadequate electronics. Poor - and poor value	Single unit, two cassettes, CD, tuner, remote		77
JVC Midi-W53 £500	Average Average	A potentially excellent middle price system spoiled by the loudspeakers and - to a lesser extent - the record player	Midi system with SEA equaliser		89
JVC Midi-W900CD £1111	Good Good +	A competent allrounder, with important convenience related features, and powerful linked recording facilities. Less strident speakers would be appreciated	Separates system, equaliser, auto-reverse cassette	R	65
JVC Midi-W91CDM £1111	Good - Average	Very well equipped (viz: multi-disc player, powerful tape related features) with acceptable but rather nondescript sound	Multi-disc player, twin auto-reverse cassette, equaliser		77
Kenwood M-54CD/CDS £600	Average + Average +	The M-54CD is the version without speakers and is the one to buy. The control system is A1 and the range of facilities offered is dazzling, but the amp and CD player are crude	Dual auto-reverse cassette, tuner/timer, CD, turntable with or without speakers	R	89
Memorex System-550 £500	Average Average +	Above average electronics let down by very poor loudspeakers. Worth considering if the latter are replaced	Dual CD & cassette deck, tuner/timer, semi-auto turntable		89
Pioneer S-11 £510	Average - Average -	Fine lower middle market system, with one useful extra - the built in timer. Only the record deck is disappointing	Twin auto reverse cassette, built in timers, one piece amp/cassette		77
Pioneer S-330D £1080	Very Good Very Good	High standard of reproduction on all sources, though mistracking with Dolby C was a limitation. There are few gimmicks and plenty of fine engineering	Dolby C/hx pro, multi-disc, amp with DAC etc	R	77
Pioneer S-555 £800	Good Good	Confusingly well equipped, in some respects rather gimmicky system, weak on record performance (surprise!) but quite or very good elsewhere	Full feature midi system with graphic equaliser, dual disc CD player	R	89
Pioneer XR-P500 £400	Good Very Good	Costly but high grade compact with excellent consistency between sources and plenty of presence	Compact system, remote control, dual auto-reverse cassette	BB	89
Proton AI-3000II £650 w/o spkrs	Average Very Good	Simple facilities and good, no-nonsense engineering combine to produce a system with genuine class. It's as easy to listen to as it is on the eye	Single box amp/tuner/CD/cassette with remote control; no loudspeakers	R	89
Sanyo 39CD £260	Poor Average -	Acceptably compromised basic low end system, offers broadly respectable if unambitious music making for those on a tight budget	One piece + CD, non-remote, manual tuner		77
Sanyo 49CD £300	Poor Average - Dolby B	Similar to 39CD, but with Dolby B, preset tuning, remote control and more power. Audio wise, it's more of the same, but there's greater stature when loud and cassettes are helped by	One piece + CD, partial remote control, digital tuner	R	77
Sanyo 59CD £380	Average - Average -	Adequate performance overall, though endemic lack of pitch integrity takes edge from tape and records. Some inconsistencies in control system too	As 49CD, + full remote, auto source select, separate turntable		89
Sanyo SYS-801CD £360	Poor Poor	Typical low end midi system: simple controls, adequate CD and tuner, poor turntable and cassette, awful loudspeakers	Remote control midi system		89
Sharp 320E £500	Poor Poor	Poor quality system featuring tacky styling, a lack of sophistication - and overpriced	One box midi & turntable with surround matrix		89
Sharp CD-X17E £500	Average Average +	Highly specified miniature with detachable speakers. AC mains power only. Good sound let down by crude upper midband and treble. Expensive for what it is	CD luggable with dual cassette & tuner, detachable speakers		77
Sony Compact 302CD £400	Average Average +	Fine low to middle price system whose only significant weaknesses are the poor tuner behaviour with weak signals and the turntable	Auto-reverse record, unidirectional play cassette, graphic equaliser etc.	R	89
Sony Compact 702CD £700	Average + Good	Creditable up-market system with reasonable speakers and excellent cassette deck, amplifier, and a relative absence of superfluous gadgetry	Twin auto-reverse cassette deck, tuner/timer, video in/out circuitry	R	89
Technics CDC30 £600	Good Good	A fine record player-less system whose electronics are well made and of moderately good performance, it's rescued from anonymity by excellent loudspeakers	5 disc multiplay top loading CD player, twin auto-reverse cassette, tuner	R	89
Technics CDX50 £750	Very Good Very Good	Conventional, well built but button bound sound system with a nearly adequate turntable and excellent loudspeakers etc.	Dual auto-reverse cassette system (tested with optional equaliser)	R	89

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MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Yamaha AST-C10 £530	Average + Very Good	Brilliant if flawed luggable with weighty, powerful bass, and a rare combination of expressiveness and clarity unprecedented from such a small package. Good features.	Mains portable twin cassette/CD/radio system detachable speakers, remote	R	77
Yamaha YST-C11 £600	Average + Good	The cassette deck is a little wobbly in tone, but CD and FM are excellent, and bass depth is unusually prodigious from such small loudspeakers, though paid by with some loss of subtlety	'Astarte', dual auto reverse cassette, luggable, with remote control		89

TUNERS

The radio medium operates at a much lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live Prom concerts can rival all other sources from a hi-fi perspective. Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen amplifier

cosmetically. However, the task they carry out is far from simple (or cheap), combining the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on local reception conditions, but money invested in a high quality outside aerial system is well spent.

Tuners come in two basic types. Analogue models tune gradually (and usually manually)

across the bands, and can have analogue or digital displays; they are often preferred for sound quality, and are certainly best for AM bands. Digital tuners offer convenient automatic tune facilities and hold many station positions in pre-set memories. (The Lab and Sound results for models tested in issue No. 65 refer to FM only. For AM results see under Comments.)

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa XT-003 £100	Average Average-	Economically designed and built in the UK, but trade-offs have a marked influence on FM and AM sound quality.	FM/AM digital, 30 presets, no signal strength meters.		93 Supp.
Akai AT-52L £150	Very Good Very Good	Holds its own on FM against many much more expensive tuners, but AM is very poor	All bands	BB	65
Akai AT-93L £250	Good + Good +	By AM standards presentable (good) while FM delivers the goods	All bands, aerial switch	R	65
Arcam Alpha 2 £180	Good Average+	Re-styled to blend in with the Alpha system, Arcam's cheapest tuner makes up for its lack of features with a sensitive front-end and mellow sound.	FM/AM analogue, no presets, manual tuning + AFC	R	93 Supp.
Arcam Delta 80 £330	Very Good Very Good	Hi-fi sound on FM, good on AM, a dependable British all-rounder	6AM, 6FM presets. FM/MW/ LW display, manual tune	BB	55
Creek T40 Series 3 £220	Average+ Average	Creek's FM-only analogue tuner is now in series 3 form, though the aesthetics remain unchanged. Our sample was hampered by an obvious bass 'hump' though production units are said to be cured.	FM-only analogue, no presets, manual tuning + AFC		93 Supp.
Denon TU-260L £100	Very Good Good+	A new cheapie from Denon with the bare minimum of features. Careful designwork promises a surprisingly open and vivacious sound, so don't overlook it!	FM/AM digital, 20 presets, manual and auto tuning.	BB	93 Supp.
Harman Kardon Citation 23 £600	Good Very Good	Fine performance, interesting features and ease of use are this tuner's forté, and the sound quality is top notch	FM/AM seek/manual adjustment muting 16 presets remote control	R	60
Harman Kardon TU9400 £250	Good Very Good	Striking in appearance and with a sound to match, this new digital tuner comfortably exceeded our expectations. On stereo FM it's HK's best yet.	FM/AM digital, 24 presets, auto-tuning + hi-blend + signal strength meter.	R	93 Supp.
Linx Theta £475	Good Very Good	A Magnum Dynalab on the cheap with the hallmark styling of this small British newcomer. Some of the best midrange from any tuner	Manual analogue tuning, no presets, signal strength meter	R	72
Magnum Dynalab FT101 £599	Good Very Good	Although expensive for its fairly minimum set of facilities, its excellent sound makes up for what it lacks elsewhere	Analogue manual tuning, no presets, signal strength meter	R	72
Marantz ST-40L £130	Average + Good	A little slow to tune but once accomplished it provides a meaty and dynamic sound on FM. AM too has a little extra bite to its performance	FM/AM digital, 30 presets, manual/auto tuning	R	93 Supp.
Meridian 204 £595	Good + Good	Pleasant sounding with a fine finish but does not make the grade at this price	FM only, auto scan, digital, remote, timer		55
Naim NAT 01 £1294	Very Good Very Good	There may be better sounding tuners in the world, but we have yet to hear one	No presets. Two box, flywheel tuning FM only, Analogue	R	50
Nakamichi ST-7E £750	Good + Good +	Exceptionally good for weak-signal areas, and good all round	16 AM/FM presets, auto time digital		55
Onkyo T9090 II £590	Very Good Very Good	It has most of the facilities you could possibly want and more besides. Lab performance and sound quality are both good enough to ensure recommendation even at this price	FM only, digital, 20 presets, auto scan etc	R	72
Pioneer F-447L £130	Average+ Average+	Equipped with a various IC-controlled servo and tuning aids, great fun to play with but of little practical benefit. Sounds OK but, on past form, we would expect more from Pioneer.	FM/AM digital, 36 presets, CCTS +SS + manual/auto seek tuning.	R	93 Supp
Pioneer F91 £350	Excellent Good +	Easy to use, this model has excellent RF performance and scored very high ratings on the listening tests	FM/AM 24 presets	R	60
Proton AT-300 £199	Good Good	The AT-300 is pretty on the outside, orthodox on the inside and rather dear. AM - poor	FM/MW only	R	65
Quad FM4 £329	Very Good Good +	Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7 presets. Digital	R	50
Revox B260 £1120	Excellent Very Good	Sophisticated and expensive, the B260 is ideally suited to the rest of the Revox range and should also work well in other systems	FM - virtually everything	R	60
Rotel RT-830AL £110	Good + Good	Fine sounding budget audiophile material, no frills, no fuss	Manual dial analogue, FM, MW, LW	BB	55
Rotel RT-850AL £180	Good + Good +	Scoring well on listening tests and one of the best sounding tuners at its price level, it was a bit let down on AM but RF performance was good	FM/AM, digital	BB	50
Rotel RT-870L £230	Very Good Very Good	Rotel's top tuner is ruggedly built and includes plenty of sophisticated electronics. It's a very slick machine to use with a sound that's equally confident and refined.	FM/AM digital, 16 presets, selectable IF/RF + RF attenuation + signal readout.	R	93 Supp.
SAE T-102 £449	Good + Good +	Expensive for all the radio you get, but sounds interesting. AM - poor	FM/MW only	R	65
Sony ST-S530ES £200	Good+ Good	The cheaper version of Sony's revered '730 certainly looks and feels the part but its sound is, well, less startling. Civilised, yes, but lacks much enthusiasm.	FM/AM digital, 30 presets, hi-blend + Cal tone + manual/auto tuning.		93 Supp.
Technics ST-G70L £200	Good+ Good+	Another very polite and refined-sounding tuner but one that does retain just enough sparkle to keep your interest. Plenty of widgets to play with too...	FM/AM digital, 39 presets, selectable RF/IF + fine tuning facility, decent signal strength meter.	R	93 Supp

The Directory

HEADPHONES

There are a variety of different approaches to headphone design, and examples of each turn up in this group. Amongst the more expensive esoteric models, electrostatic drivers are used in square open-backed phones such as the Jecklin and Stax models.

The majority of these come with some form of transformer which takes the signal initially from the speaker terminals on the amplifier. The actual speaker cables then travel from this unit

bypass switch to the loudspeakers.

The more down to earth models feature dynamic drivers in circular open-backed designs. The advantage of open backs seems to be a correspondingly open sound and a less claustrophobic feel to the music.

One can also of course hear external noises, as well as irritating the hell out of people on public transport.

The third category are closed-back designs,

which are useful in situations where it is necessary to block out background noise. Another means of distinguishing different types is the way they sit on your head.

There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs press on the outer ear (pinna); and intra-aural types rest inside the ear and are popular amongst users of personal stereos.

MODEL PRICE	LAB SOUND	COMMENTS	TYPE	VALUE	ISSUE
Aiwa HP-V99 £50	Good - Average +	Horn loaded in-ear miniatures with plenty of guts but not enough transparency or bass to compete with the headbanded competition	Intra-aural, closed-back, dynamic		75
Aiwa HP-X30 £30	Good Good -	A flashy personal stereo phone which alternatively could be used at home. A slight LF tonal preference slightly colours the response, but it ain't a bad can	Supra-aural, closed-back, dynamic		75
Aiwa HP-X80 £50	Good Good	A headphone that's highly suited to non acoustic music and portable sources, nicely made and slickly finished. Sound quality doesn't quite match the price	Supra-aural, closed-back, dynamic		75
Aiwa HPEX-200 £90	Good Good	Modern looking and well finished, the Excelias, as they are dubbed, had meaty bass and sounded reasonably open for the type	Circumaural, closed-back, dynamic		63
AKG K135 £33	Poor Average	Despite a very appealing design the K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural, semi-open, dynamic		63
AKG K145/S £60	Good + Good +	Electrostatic tweeters combine with a dynamic mid/bass unit to create very confident sounds in a comfortable headphone. Balance is on the bright side	Supra-aural, semi-open, electrostatic/dynamic	R	75
AKG K240 Monitor £60	Very Good Good	Something of a classic, these AKGs are very user friendly in all respects; sonically on the warm side of neutral	Circumaural, semi-open, dynamic	R	63
AKG K280 Parabolic £90	Good Very Good	A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural, open-backed, dynamic	R	63
AKG K340 £140	Good Excellent	Heavyweight cans in most respects, the K340 with its electrostatic tweeter is a very revealing headphone. Gives the total electrostatics a good run for their money	Circumaural, closed-back, electrostatic/dynamic	R	75
Audio Technica ATH909 £60	Average Average	Quite impressive in the treble though a bit bass shy, the 909s worked well at high levels	Circumaural, semi-open, dynamic		55
Audio Technica ATH910 £70	Average Good	The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural, closed-back, dynamic	R	55
Audio Technica ATH911 £80	Very Good Very Good	Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural, open-backed, dynamic	R	63
Beyer DT 325 £30	Very Good Average	Lightweight in more ways than one, the 325s may be a little bright for some systems and tastes but will suit duller sources	Supra-aural, open-back, dynamic	R	63
Beyer DT330 Mk II £45	Good Poor	Not the most revealing 'phones encountered, the 330s were nevertheless enjoyable and rarely offended	Circumaural, semi-open, dynamic		55
Beyer DT550 £69	Good Good	On their own the 550s sound articulate with a slightly 'gritty' treble and 'keen' midrange; not suitable for headbangers!	Circumaural, semi-open, dynamic		55
Beyer DT880 £90	Good Good	Well made cans with a warmish sound but fairly solid midrange, though they're not that informative for the price	Circumaural, semi-open, dynamic		63
Beyer DT990 £100	Very Good Very Good	The 990s are definitely a significant pair of dynamic headphones; they have a smooth and yet revealing neutral sound that is hard to criticise	Circumaural, open-back, dynamic	R	55
Beyer IRS690 £200	Good + Very Good	High quality infra-red headphones with soft comfy earpads and mellow but informative sound quality which is hard to dislike	Circumaural, open-back, dynamic	R	75
Jecklin Float Electrostatic £399	Good Excellent	One version of the state-of-the-art, these electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural-ish, open-back, electrostatic	R	55
Jecklin Float Model One £79	Good Very Good	Whilst very unusual in appearance, the Floats give remarkable sound quality and openness at a reasonable price	Circumaural-ish, open-back, dynamic	BB	55
Jecklin Float Model Two £99	Good Very Good	Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. Note lack of adjustment means you should try before you buy	Circumaural-ish, open-backed, dynamic	R	63
JVC HA-D990 £65	Good + Good +	Good looking well made cans that offer good sound quality for the money. Sonic nature is of the easy-going, laid-back variety	Supra-aural, closed-back, dynamic	R	75
Koss K/6X Plus £30	Average Poor	'Sixties-style' 'phones from the good ole US of A, their sonic style is unique and can make a system sound quite different	Supra-aural, closed-backed, dynamic		63
Koss TD/60 £20	Good Average	Although they're devoid of channel identification and have a decidedly Stateside approach to sound, these are very listenable phones for the price	Supra-aural, closed-back, dynamic		75
Pioneer SE-72 £30	Good + Average -	Neat, very nicely made personal stereo phones along the lines of Sony V3s. Sound is on the veiled side, good for aggressive sources	Supra-aural, closed-back dynamic		75
Quart Phone 30 £40	Good Average	Whilst not as seductive as their PMB25 predecessor, the 30s are reasonably neutral and do improve on some of the competition - though not stunning	Circumaural, semi-open, dynamic		63
Quart Phone 70 £70	Good Good	Competent performers that were hard to criticise but lacked the life and sparkle of which some of the competition are capable	Circumaural, closed-back, dynamic		63
Quart PMB 25II £40	Good Good	Despite a somewhat unconventional suspension system, the 25s put in a convincing and enjoyable performance with warm yet lively balance	Circumaural, open-back, dynamic	BB	55
Quart PMB 65 £70	Good Good	Quite revealing and neutral albeit with the usual closed back sound, this competes well with more established models	Circumaural, closed-back, dynamic	R	55
Quart PMB 85 £90	Average Very Good	These more expensive Quarts bear a striking resemblance to the Jecklin Float models and use two drivers per ear. Sound is a bit bass heavy but not bad overall	Circumaural, open-backed, dynamic		63
Realistic Pro-X £25	Poor Average -	Robust, unanimously uncomfortable and heavily veiled in sonic terms - not a great success	Supra-aural, closed-back, dynamic		75
Ross RE-2760 £35	Poor Average	Stylish white cans from the only British firm in the business. Unfortunately sound quality is not up to par in this price range	Supra-aural, closed-back, dynamic		63
Ross RE2530 CD £20	Average Average	Rather an 'average' £20 phone that some found uncomfortable due to high pressure on the ears. Sonic balance is on the bright side	Supra-aural, closed-back, dynamic		75

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HEADPHONES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Ross RE2560 CD £25	Good Average +	If you're not too fussy about quality of finish and don't have an elfin head then these British phones warrant attention. Sound could be smoother	Supra-aural, semi-open, dynamic		75
Sennheiser HD40 £20	Very Good Good -	Very light and comfortable headphones with an even sonic balance that will suit most sources, but jack is 6.3mm and not suited to personals	Supra-aural, semi-open, dynamic	BB	75
Sennheiser HD450 £35	Good Average	Modern, simple and lightweight phones that are remarkably robust and which turned in a relaxed if weighty performance that was at worst pleasant	Supra-aural, semi-open, dynamic	R	63
Sennheiser HD480 £45	Good Average	Using the same shell as the 450s, the 480s were a little softened and unrevealing by comparison with their competitors	Supra-aural, semi-open, dynamic		63
Sennheiser HD520 £65	Good + Good +	A very comfortable and musically capable headphone. If you've got this sort of bread to blow on cans, give 'em a blast	Circumaural, semi-open, dynamic	R	75
Sennheiser HD530 £75	Very Good Good +	One of the better dynamics in its group, the 530s create a sense of space that eludes most sub £100 cans, and they're dead comly to boot	Circumaural, semi-open, dynamic	R	75
Sennheiser HD540 Ref Gold £160	Good Very Good	The 540 Golds prove that dynamic headphones can be subtle, informative and capable of creating a remarkable sense of space	Circumaural, open-back, dynamic	R	55
Sony A21EX £20	Good - Good -	Forward facing in-ear drivers on a folding plastic band provide exceptional clarity for such an inexpensive phone. However, no bass, and fit isn't to everyone's taste	Intra-aural, semi-open, dynamic	BB	75
Sony MDR V3 £30	Average Good	Portable stereo oriented phones that are very nicely made and combine clarity with a pleasant lack of distortion	Supra-aural, closed-back, dynamic	BB	63
Sony MDR V7 £70	Very Good Very Good	Classy sounding cans that are very slick and work well with all types of music, setting the standard in their price range	Circumaural, closed-back, dynamic	R	63
Sony MDR-CD999 £120	Good + Very Good	A very nice headphone in all respects, the 999s are worthy of the best headphone outputs and high quality sources	Supra-aural, semi-open, dynamic	R	75
Sony MDR-R10 £2500	Excellent Excellent	Costly state of the art sealed moving coil design built to the highest standards using the finest materials. Sound quality reflects this care, being big, clear, sweet and refined	Circumaural, closed-back, dynamic	R	72
Stax Gamma pro/SRD-X pro £296/£230	Very Good Excellent	The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural, open-backed, electrostatic	R	63
Stax Lambda Signature/SRM-T1 £470/£895	Very Good Excellent	The Signature when combined with the SRM-T1 valve driver must be the most transparent headphone available	Circumaural, open-backed, electrostatic	R	72
Stax SR Gamma £299 (inc. SRD-6 Adaptor £100)	Very Good Very Good	The next model down the Stax range from the Lambda, the Gamma is an excellent headphone with little to criticise but the price	Circumaural, open back, electrostatic	R	55
Stax SR Lambda Pro/SRD-7SB Mk2 Adaptor £360/£185	Very Good Very Good	A bit of an industry reference, the Pros are frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural, open-back, electrostatic	R	55
Stax SR Lambda Pro/SRM-1 Energiser £360/£635	Very Good Excellent	This combination extracts layers of information that other headphones only hint at. The SRM-1 has more edge than the SRM-T1, but it's good	Circumaural, open-back, electrostatic	R	75
Stax SR34 £140	Average Very Good	The least expensive Stax headphones around, the SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural, open-back, electret		55
Stax SR84 £210	Very Good Very Good	The stepping stone between dynamics and full electrostatics, these electret phones are revealing, open and highly enjoyable	Supra-aural, open-backed, electret	R	63
Yamaha YHL-006 £30	Average Average	Unusual personal stereo oriented phones that curl up when not in use. Earphones are like golf balls and balance is well suited to Walkmans	Supra-aural, open-back, dynamic		75

PERSONAL STEREOS

Whilst not exactly hi-fi components, personal stereos probably play more music to more ears than all manner of domestic systems and as such demand some attention.

Now that personal CD players have joined the ubiquitous Walkman in the market, the variety and standard of sound quality is huge, with obscurely named cassette players practically falling out of your cornflakes packet and the top Discmen going for £300 or more.

Despite their diminutive size personals attempt to incorporate as many gimmicks and features as possible, cassette players often incorporating tuners, Dolby noise reduction or even graphic equalisers.

CD players are still relatively expensive, although prices have come down a lot, and don't tend to vary that much on the features front, rather the amount and quality of accessories differs. Rechargeable batteries are extremely useful and increasingly popular, some can now be recharged within the unit and charge capacities are also being increased.

Most models come with a mains adaptor, which in some cases doubles as a battery charger and some include a wired remote control. A few are now appearing with infra-red remote control although this is more applicable to CD players.

Sound quality on the cassette front seems to

have a proportional relationship to price and integrity of construction – wow and flutter being quite obvious on the cheaper models.

CD players become less noisy as they get dearer and also reduce in size; one drawback of the latter seems to be that immunity to shock suffers as a consequence, although newer models are starting to buck this trend. Cassette players do, on the whole, seem better suited to the outdoor life than their digital counterparts, as does the software.

Bear in mind that the sound and lab ratings given below cannot realistically be compared to those in other categories or between cassette and CD personals

PERSONAL CASSETTES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa HS-PL300 £110	n/a Average	Good looking, simply laid out player with a sensible selection of features and reasonable sound quality for a small player of this price	Dolby NR, chrome/metal eq, remote		78
Aiwa HS-PX303 £150	n/a Good	Chunky and macho styling combines with comprehensive features and a half decent transport to make a powerful personal	Dolby BC, chrome/metal EQ, remote	R	78
Panasonic RQ-P505 £100	n/a Poor	Very attractive and neat little player with nicely designed controls and XBS bass boost, but sonically it's limited by distinct wow and flutter	Dolby, chrome/metal eq, remote		78
Panasonic RQ-P525 £120	n/a Average +	Fitted with what is effectively a bass only tone control and harbouring all the necessary features, the 525 also has a knack with tape replay	Dolby B & C, chrome/metal eq, remote	R	78
Saisho PS90R £40	Poor Poor	A bit of a jumble of features and gadgets, the PS90R has on-board speakers, an extending aerial and even records, but sound quality is dubious	Graphic EQ, types I, II & IV, AM/fm, recorder		56
Sharp JC-270E £130	n/a Average -	Slightly old fashioned design combines with a basic feature count and mediocre sound quality to make an apparently uncompetitive player	Dolby, chrome/metal eq, remote		78

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PERSONAL CASSETTES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Sony Walkman Pro £249	Good + Very Good	One of the finest sounding cassette decks on the market today. A mandatory Best Buy, it takes other personals to the cleaners (except on weight and power consumption)	Dolby B, C, types I, II & IV, record, line in/out, varispeed	BB	52/56
Sony WM-701C £200	n/a Good -	Beautiful little machine with all the necessary buttons'n'switches and a fundamentally exceptional sound quality, marred unfortunately by wow and flutter	Dolby B & C, chrome/metal eq, remote, folding phones		78
Sony WM-BF65 £90	n/a Average +	Regular size radio/clock/cassette player with a bright even open balance and Sony's forward facing phones. Not as glamorous as slightly more expensive models but sonically not bad	Dolby, chrome/metal eq, radio, alarm clock	R	78
Toshiba KT-4549 £80	n/a Poor	Fully equipped with 10 preset radio and alarm clock, the KT-4549 is a bit aggressive on the sonic side and the bass boost system lacks balls	Dolby, chrome/metal eq, radio, alarm clock		78

PERSONAL CDS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa DX-P50 £150	n/a Average -	A tad aggressive both through earphones and domestic systems, not very walkable but it has got two stage bass enhancement	Digital output, mains adaptor, remote		94 Supp
Denon DCP-100 £250	n/a Good	Solidly constructed and nicely finished in the slightly impractical Velvex, almost walkable, competent if uninspiring sound quality	Remote, mains adaptor, no earphones, rechargeable batts		94 Supp
Denon DCP-50 £180	n/a Average +	Not very walkable, but lightweight and nicely finished in a nextel like grey. Sound through a system is a tad unexciting but not too bad	No headphones, remote, mains adaptor		94 Supp
Goodmans GCD-10 £120	Average - Poor	Cheap, flashy and not short on accessories, the GCD-10 is a rather noisy player that left a lot to be desired on the sound quality front	13.5 x 3.7 x 18cm, 478g, mains adaptor		66
Kenwood DPC-41 £150	n/a Average -	Lightweight, not very walkable but nice control layout. Sound through the phones is on the thin side, through the line output it's pretty average for a portable	Mains adaptor, rechargeable batts		94 Supp.
Kenwood DPC-77 £270	Good + Very Good	Very chunky and well made, the DPC-77 is the only player to include a digital output and sounds very good through its analogue output - a suitable domestic alternative adaptors	12.8 x 3.5 x 14.5cm, 750g, digital output, mains & in-car	R	66
Kenwood DPC-81 £200	n/a Good +	Chunky metal cased player that makes pretty confident sounds through a system but sounds dry via earphones and ain't exactly walkable	Remote control, mains adaptor/charger and batts, digital output		94 Supp
Philips AZ6897 £150	n/a Good +	Unusually designed and equipped with a radio the Philips is almost joggable, it sounds remarkably good via a system and a little cautious through the phones	Mains adaptor with built in plug, wired remote, clock	BB	94 Supp.
Sanyo CP-12 £260	Average Good +	Sonically amongst the more enjoyable personal CD players and capable of revealing the musical aspects of a disc in an interesting and entertaining fashion	12.5 x 2 x 12.7cm, 380g, wired remote, mains adaptor	R	66
Sony D-350 £300	n/a Good	More buttons and widgets than any of the others but not the sound quality or walkability to go with it	Mains adaptor, clock, comprehensive facilities		94 Supp.
Sony D-66 £180	n/a Average +	One of the few walkable CD players on the market, sound quality is a little muddled but not offensive	Mains adaptor, rechargeable battery pack	R	94 Supp.
Technics SL-XP1 £130	n/a Good +	Remarkably competent and enjoyable player that you can actually use on the move and sounds enthusiastic through a domestic system	Rechargeable batts, mains adaptor/charger	BB	94 Supp.

CABLES AND CONNECTIONS

Although cables and connections are sometimes thought to be the least important items in an audio system there has been a growing awareness in recent years that they have a significant effect on sound quality. To this end there is now a vast array of exotic cables and interconnects available to those interested in experimentation. The key observation on cables is that they are much more than mere accessories. Carrying the audio signal, just as any amplifier does, it's really not too surprising that they can influence sound quality.

The characteristics of any cable are determined by the materials and topologies utilised in its construction. The purity of the conductor, nature of the insulator dielectric, mechanical construction, physical geometry, RF characteristics, efficiency of screening and finally the connectors themselves, all play vital roles in the sonic character. These factors tend to vary more with interconnect cables which are used to carry the signal between active components like pre and power amplifiers. The interconnects summarised here were tested in 1m terminated

lengths and therefore the results and prices relate to that length - some cables may well perform differently when used in longer lengths. What's more, most cables are significantly cheaper if you are prepared to fit the plugs yourself

The features column contains information on the material makeup of the different cables with the following abbreviations: OFC - oxygen free copper, OFHC - oxygen free high conductivity (Audionote defines HC as high crystal), PC-OCC - pure copper by ohno continuous casting, LC-OFC - linear crystal oxygen free copper.

INTERCONNECT CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Audio Technica AT6115 £40	Very Good Average	This cable sounds somewhat 'quieter' than the original LC-OFC interconnect, but is also less transparent and three dimensional	PC-OCC copper coaxial		59
Audionote Copper ANA £44	Average Good	ANC sounded punchy with a faintly lean but tightly-focused bass character. This crystalline precision waned slightly at higher frequencies	OFHC copper twin-axial	R	59
Audionote Flexible Silver ANS £99	Average Very Good	ANS scored a hit with its transparent midband and revealing but quite unforced treble quality. Bass transients were slightly softened	Silver signal & Copper screen	R	59
Audionote Silver ANV £154	Poor Excellent	Far weightier-sounding than the flexible ANS, ANV interconnect also possesses a fair degree of treble clarity and sparkle	21 strand silver Litz		59
Audioquest Livewire Ruby £49	Average Good	Smoother sounding than the Topaz, the extended crystal Ruby is less grainy and coarse, better able to resolve complex passages	FCL copper twin axial	R	59
Audioquest Livewire Topaz £35	Good Average	Sounding 'bigger' and faintly richer than Reference 2, Topaz was also slightly grainy at the top end	Gold-plated plugs, OFHC copper		59
Budget OFC Circa £7	Average Average	Subjectively, this cable did lift much of the aural fog experienced with scrawny standard hook-up leads.	OFC		59
Budget Patch Cords (see text)	Average Poor	As thrown in gratis with cassette decks and the like - frequency extremes were restricted and performances were veiled	Thin coaxial		59
Chord Mono-t £27/1.2m	Average + Average +	Offers a slightly rolled-off treble but its rich sound is an upgrade from patch-cords	Unsymmetrical 4-conductor cable	R	83 Supp.

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INTERCONNECT CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Deltec Black Slink £152	Excellent	Inherently neutral, the cable faithfully reproduced broad and deep stereo soundstages with precise focus and a sense of facility	8 silver plated OFC strands PTFE dielectric	R	59
Deltec Gortex Black Slink £152	Very Good Excellent	A true reference quality cable providing an exceptionally detailed and transparent sound	Symmetrical, 8-conductors, Gore-tex ins.	R	83 Supp.
Deltec Slink £32	Good Very Good	Ideally used in lengths of under 4 metres, it errs on the lean side of neutral but has an uncommon transparency in the midrange	4 silver plated OFC strands PTFE dielectric	BB	59
Denon LC-OFC N/A separately	Very Good Average	Supplied with Denon's dearer CD players, this cable introduced a peculiar 'twangy' coloration at high frequencies, and a slightly soft bass	LC-OFC, non-magnetic gold plated plugs		59
DNM Solid-core £23	Average Good	Transparent in the midband and full of sparkling detail in the treble, low bass was slightly curtailed (unterminated price £2.30 per m.)	Single strand nickel-plated copper. Unshielded	R	59
Isoda Electric HC-05-PSR £54	Good Good	A pleasantly lively and fluid sounding cable though softens some subtle, midband detail	Aluminium + brass multistrand cable	R	83 Supp.
Kimber Kable KC-1 £65.55	Very Good Average	Tonally faintly leaner and brighter than the more open-weave PSB, KC-1's treble detail was just too sharp and grainy	Multi-gauge PTFE dielectric		59
Kimber Kable PSB £41.40	Very Good Very Good	An exceedingly transparent midband but slightly 'clanky' treble. It always managed to sound remarkably uncluttered and open	OFC, PTFE dielectric	BB	59
Monster Interlink 300 £24	Average + Average	A big, larger-than-life sound but with some emphasis of midband detail and loss of bass	Screened, symmetrical cable		83 Supp.
Monster Interlink 400 £34	Good Good	Bass is solid and punchy, counterpointed by a slightly overblown midband which tends to make vocalists sound larger-than-life	Multi-gauge	R	59
Origin Live Soli-Core Super £60	Good Average	Improves over previous Soli-core samples in stereo depth and bass weight, but a 'loud' treble presentation remains	Solid-core gold-plated AT plugs		59
QED Incon Graphite GP1 Gold £18.95	Average Average	A shielded version of Incon P1, it sounded thicker at the frequency extremes, the top end being coarser and more out of focus. Good for long runs though	OFHC Graphite shielding	R	59
QED Incon P1-Gold £15.95	Good Good	A lively open presentation that just borders on the lean side of neutral, the quick and lucid delivery affording considerable musical insight	OFHC, gold plated Deltron plugs	BB	59
Sterling £250	Average Good	Possessing a neutral if faintly rich overall balance, it supplies a pleasantly open and transparent perspective. (Reviewed in pre-production form.)	2 silver strands per conductor		59
Supra EFF-1 £60/0.75m	Average Average	A new, costly and mildly disappointing addition to the range. Edgy, smeared sound	Screened, symmetrical dir. cable		83 Supp.
Thorens SAC 100 £50	Good Average	Performance is undermined by a slightly coarse and splashy treble, not necessarily bright, simply rather confused - and fine detail lacks resolution	Silver-plated OFC, coaxial		59
van den Hul MC-D300II £45	Poor Good	It tended to highlight some upper mid detail, but a generally open and spacious acoustic proved its saving grace. Slightly soft at LF	Silver plated single strand VdH plugs	R	59
van den Hul MC-Gold £250	Average Good	It possesses a rich and beguiling treble balance that matches a weighty, slightly warm bass character. Seductive balance may prove worthwhile in some circumstances	Silver & gold plated copper		59
van den Hul MC-Silver £750	Good Good	Although remarkably transparent for an asymmetric design this costly cable was not considered to be of 'state-of-the-art' standard, and is bettered by cheaper models	19 silver plated copper strands		59
van den Hul MCD-1021II £69	Good Good	Possessing the same endearing qualities as the D300, it presented open and transparent soundstages and improved timbral resolution	Twin axial silver plated copper	R	59
van den Hul Thunderline £150	Good Average	Thunderline essentially parallels the sonic performance of the cheaper D102. HF is occasionally tainted by a 'tizzy' 'coarseness', bass is tight and dry	Silver plated 'matched copper'		59
Yfere LC-DFC Quad £85	Very Good Very Good	New cable with a very refined sound. Very transparent with good sense of focus and space	Symmetrical, star-quad with screening	R	83 Supp.

LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Absolute Wire Force 4 £4.75 per metre	Good Average +	By current standards there was a loss of fine, sharp detail at the frequency extremes, but it has a big, friendly sound	744 OFC strands, PVC dielectric		64
Audio Innovations OR-200 £16 per metre	Average + Average +	Open and detailed throughout the midband but a grainy coloration tended to corrupt subtle timbral information at very high frequencies	200 LC strands, polyurethane and cotton dielectric		64
Audio Technica AT6120 £10 per metre	Average + Average	Compared to earlier LC-OFC cables, this PC-OCC derivative sounded smoother and less aggressive	PC-OCC, PVC dielectric		64
Audionote AN-SP £100 per metre	Average - Excellent	A clean and open sounding cable that offered a deep and pleasantly detailed perspective. Bass was slightly restricted, but seemed tight and coherent	15 silver strands, polyethylene dielectric		64
Audioquest Livewire Black £15 per metre	Good Good	It proved clear and punchy but with some grain across the treble. Nevertheless Black remains an interesting concept and proved better than Livewire Green	OFHC, surface only - foam core construction	R	64
Audiospec Latitude L4 £3 per metre	Average + Average +	Warm, ruddy but also mildly muddy sound with some slight emphasis of bass notes	Fig.-of-eight multi-strand, PVC diel.	R	83 Supp.
Bellwire 12p per metre	Poor Average -	Broadly speaking it delivered a bright and tizzy sounding treble with a fairly open and detailed mid with little or no bass resolution	0.5mm single strand, PVC dielectric		64
Deltec 8S £144 - 5m pair	Good Good +	The unerring transparency and detail resolution of 8S throughout the midband makes it a cleaner and more spacious sounding cable than others at the price	4 silver plated OF copper strands, PTFE	R	64
Deltec Gortex Black 16 £528 - 4.5m pair	Very Good Excellent	Improvements in bass resolution, transparency and treble poise maintains status of this cable	Silver-plated OF copper with Gore-tex ins.	R	83 Supp.
DNM Solid core £3 per metre	Average Average	A good general-purpose solid-core, though too bandwidth limited for high-end applications. Sounds great in some systems	0.65mm single strand, webbed PVC dielectric	R	64
Exposure £2.50 per metre	Good Good	It could sound a trifle matter of fact but this emotive flattening was also somewhat dependent on the music program. It is also highly suited to long runs	56 OFC strands, webbed PVC dielectric	R	64
Furukawa FS-2F09 £3.50 per metre	Good Average +	Some loss of bass weight but otherwise offers a fresh and open sound. Good value	Multi PC-OCC stranding, PVC dielectric	R	83 Supp.
Furukawa FS-2T15S £50 per metre	Good + Very Good	An advanced solid-core cable with a highly fluid, detailed and inherently musical sound	Single 1.5mm Super PC-OCC	R	83 Supp.
Kimber 4VS £7.15 per metre	Average + Average	Similar construction to 4TC but dissimilar materials infer a slightly tizzy sound	Open-weave, multistrand, PVC ins.		83 Supp.
Kimber Kable 4PR £54 - 5m pair	Average Average +	This directionally marked cable benefited from an open and airy treble quality but seemed notably leaner than 4TC. Bass was well round and satisfyingly taut	4 x 7 copper strands per conductor, PVC diel.		64
Kimber Kable 4TC £17.65 per metre	Good Good +	4TC made a great impression in the listening tests with an open midband, a smooth and unfatiguing treble with slightly rich but suitably weighty bass	OF copper, PTFE dielectric	R	64
Linn K20	Good	Subjectively, it erred on the forward and bright side of neutral but enjoyed an essentially	56 OFC strands, webbed PVC		64

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LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
£2.88 per metre	Average	clar and punchy delivery	dielectric		
Marantz ML-55S £30 - 10m	Average	Subjectively, this cable offered a loose and splashy treble which, though not overtly bright, did compromise both tonal and timbral accuracy	30 OFC strands, 3 conductors PVC diel.		64
Mission Cyrus £2.50 per metre	Average + Good	Because of its impedance characteristic this cable will deliver a smooth and unfatiguing treble balance with loudspeakers offering an easy load	0.8mm single strand, PVC dielectric	BB	64
Monitor PC Silverline PC4 £5.75 per metre	Good Average	Sonically, it laboured under a heavy and claustrophobic balance, lacking the see through transparency and lucidity of the better solid core cables	2072 x 0.07mm silver plated copper strands		64
Monster Original £4.50 per metre	Good Average +	Original sounded relatively congested and murky at higher frequencies but possessed weight and conviction in the bass	Multistrand		64
Monster SCI 16-4 £3 per metre	Average Average	Not as thick-sounding as early Monster cables but still slightly unbalanced. Versatile construction	4 x 16-gauge conductors, OFC strands		83 Supp.
NVA LST1 £6 per metre	Average + Good	A light and breezy sounding cable best suited to short lengths, NVA benefited from a clear and transparent outlook	7 x 0.25mm silver alloy strands, PTFE	R	64
Origin Live Soli-Core Ordinary £1.80 per metre	Good Average +	Subjectively it bettered the performance of the costlier Super version, affording a pleasantly detailed and spacious soundstage with firm bass but slightly coarse treble	1.8mm and 0.5mm single strands	R	64
QED 79-Strand £1 per metre	Good Average	For much of the last decade QED 79-Strand has been the first port of call for enthusiasts on the upgrading ladder, a tradition that should still hold true today	79 strand, PVC dielectric	R	64
QED Flat 200 £2.20 per metre	Good Good	I detected a degree of confusion at low frequencies but this did not stifle the acoustic atmosphere which remained open and positive	200 strands, flat webbed PVC dielectric	R	64
QED Incon Graphite £2 per metre	Average + Average +	This graphite version of Incon sounded cruder and generally more heavy handed than the cheaper unshielded type. Overall presentation was mildly restricted and cloaked in a faint aural fog	OFHC, polymeric screen		64
Rotel Supra 10 £8.95 per metre	Good + Good	Supra 10 provided a very free and open sound that was unhindered by any excess at low frequencies. Worth its weight in scrap copper!	2,562 OFC strands, webbed PVC dielectric	R	64
Rotel Supra 4 £3 per metre	Good + Good	Ideal for both long and short runs, it furnishes a big sound that benefits further from a smooth, unatiguing treble	1,036 OFC strands, webbed PVC dielectric	R	64
Solid core lighting cable 36p per metre	Average + Good	It enjoys much of the smooth treble and articulate midrange usually associated with the better solid core derivatives. Lean but taut and rhythmically coherent	1.5mm square, 3 cores, PVC dielectric	BB	64
Sterling £99 per metre	Average Average	This pre-production sample possessed a strangely muddled and reserved sound quality. It suffered from a progressive instrument modulation	Pure Silver, PTFE dielectric		64
Townshend Isolda £400 - 5m pair	Average + Good	Isolda possessed a truly dark background out of which rose a very solid and extended bass together with an excellent sense of transparency through the upper octaves	8 coax cables per conductor - very thick	R	64
van den Hul CS-122 £5.95 per metre	Average + Good - treble	Characterised by a driving and powerful bass, CS-122 is a heavy sounding cable. Mid treble detail was refreshingly clear but there was a slightly muted air about the extreme treble	19 x 0.45mm silver plated strands, webbed rubberised	R	64
van den Hul CS-352 £12.95 per metre	Good Average +	Subjectively it sounded like CS-122 only more so, the deep rumbling bass tending to overwhelm subtle musical details. It also appeared a trifle peaky in the treble	7 x 0.76mm + 168 x 0.125mm silver plated strands, rubberised diel.		64
van den Hul SCS-12 £29.95 per linear metre	Good + Good +	SCS-12 set a high standard with a tight and well focused soundstage populated with tactile stereo images. Bass wasn't as extended or resolved as some other cables	19 silver plated strands of 12 different gauges, PTFE dielectric	R	64
van den Hul SCS-2 £99.95 per linear metre	Good + Good +	Overall it was commendably neutral and transparent but nothing less would be acceptable bearing in mind the tremendous cost of a stereo pair	665 silver plated matched crystal copper strands, PTFE dielectric	R	64
Vecteur R-CV30 £5.40 per metre	Average Good	Subjectively the better of Vecteur's cable line-up offering a neutral overall perspective but slight loss of detail resolution at both frequency extremes	4 x 0.8mm LC-OFc PTFE insulated strands	BB	64

STANDS AND SUPPORTS

It's becoming more and more apparent that all the components in a hi-fi system benefit from being placed on the right kind of support. It is already acknowledged that performance of electro-mechanical transducers, such as turntables and loudspeakers, can be greatly improved by using highly rigid supports. This notion has been expanded to include electronics such as amplifiers and compact disc players, and inevitably a broad range of stands and supports have been produced to cater for this requirement.

With loudspeaker stands there seems to be two broad schools of design. The most common

is the open frame type which uses square section steel tubing (usually less than an inch square) made up to form a tripod or quadropod stand usually fitted with spikes top and bottom to ensure good coupling to both floor and cabinet. However, for reasons of domestic harmony this latter option is often not pursued as eagerly as perhaps it should be.

The alternative approach is to use mass. Larger section (approximately 3 inch x 2 inch) tubing is welded between square top and bottom plates and filled with sand and/or lead shot. Again, this type uses spikes at the base but Blu-

tack or the like for coupling with the cabinet.

Equipment supports generally place isolation quite high on the list of priorities and usually use a lightweight steel frame to support an MDF platform. Once again spikes are used to minimise contact with the platform and ensure good coupling to the floor. Minimising weight without compromising rigidity seems to be the aim with turntable supports but those designed for electronics often employ some form of damping to kill vibration, sometimes in the form of mass.

LOUDSPEAKER STANDS

MODEL PRICE	LAB SOUND	COMMENTS	TOP PLATE SIZE, HEIGHT	VALUE	ISSUE
Apollo A10 £52.50	4 leg Average	A robust and lightweight model, it would make an ideal upgrade for those still happy with the big boxes of old.	19 x 19cm 44cm	R	58
Apollo A820 £44	4 leg Average	A light open-framed budget design slightly lacking in rigidity and subjectively superceded by other stands costing £10 more.	19 x 19cm 53cm		58
Audio Dimensions Classic 2 £110	4 leg Average	Built in the heavyweight tradition and damped with chalk. Solid, stable, tactile sound	20.3 x 20.3 x 52cm	R	83 Supp.
Foundation Fred £70	2 leg Average	With sand filling the Freds made speakers sound tight and coherent with a more even balance.	19 x 19cm 36/43/59cm		58
Foundation Maggi £159 to order	Plinth Very Good	Made for Magneplanar and other similar panel speakers they seem to have a healthy effect on the sound quality thereof.	50 x 2cm 2cm	R	58
Foundation Pi £269 to order	2 leg Very Good	Overpriced in material terms the Pi nevertheless has a very positive effect on the low frequency performance of conventional speakers.	20 x 20cm 25/38/46/5	R	58

The Directory

LOUDSPEAKER STANDS

MODEL PRICE	LAB SOUND	COMMENTS	TOP PLATE SIZE, HEIGHT	VALUE	ISSUE
Foundation Sir Fred £80	2 leg Good	Upgraded 'Fred' with special in-fills. Sweet sound but one that also lacks bite and edge	19 x 19 x46.5cm		83 Supp.
Golding Black Satin £65	1 leg Very Good	Screw together stand tastefully hewn from medite. Some loss of bass but still pleasantly rhythmic	18 x 20 46cm	R	83 Supp.
Heybrook HBS1 £99	4 leg Very Good	With its new aluminium base frame the HBS1 fared very well in the listening tests. It allowed much of the speakers own 'sound' to remain intact.	23 x 21cm 47cm	R	58
Heybrook Point 5 £55	3 leg Very Good	An unusual triangulated open frame stand that can help certain speakers sound more transparent and fluent - a good value stand	23 x 21.5cm 47cm	BB	58
Linn Kan II £99	4 leg Very Good	Built to support Linn's Kan speaker this stand is well suited to the task, but is less successful with other loudspeakers.	19 x 16cm 59cm		58
Linn Sara £110	4 leg Very Good	The Sara exhibits some odd properties so its use other than with the Sara loudspeaker should be viewed with caution.	25 x 21cm 53cm		58
Monotrak Engineering M1 £58	1 leg Good	The M1 gave the mid and treble a commendably smooth and detailed presentation but bass sounded rather lacklustre and muddy.	19 x 18.5cm 48cm		58
Monotrak Engineering M4 £58	4 leg Very Good	Begging comparison with Heybrook's HBS1 the M4 maintained much of the openness and forthright detail of that model.	23 x 21.5cm 53cm	R	58
Monotrak Engineering M4S £58	4 leg Very Good	Its stature and stability would seem to mark it out as most suitable for smaller, lighter cabinets. The M4S possessed an open midband and clear treble.	20 x 17.5cm 53cm		58
Origin Live Advanced £145	3 leg Good	One of three related tripod-like stands. Stable sound with good sense of depth and power	22 x 20.6 44cm		58
Origin Live Three Leg £89	3 leg Good	An unusual tripod stand devoid of top plate and taking up more floor space than normal, subjective and technical performance was exemplary.	(support area) 22 x 17.5cm 52cm	R	58
Partington PP4 £60	1 leg Good	The PP4 offers a rather mixed performance, though when damped with sand infill it was less ready to embellish the overall sound and low frequencies became tauter and quicker.	18 x 16.5cm 48cm		83 Supp.
QED TS22 Tristand £60	3 leg Very Good	Most tracks sounded uplifted or buoyant, never thick nor coloured. It worked well with most of the speakers tried and encouraged a fluid and revealing midband.	19 x 17cm 45/50/58cm	BB	58
Stand Design Z20 £70	1 leg Excellent	Well built and finished with optional sand in-fill. Ideally suited to Wharfedale 505.2's	16.5 x 19 50cm	R	83 Supp.
Target HJ15/3 £107	3 leg Very Good	Sound quality was basically very good though without the sand infill some loudspeakers may sound a little unbalanced as both bass and treble regions are subjectively exaggerated.	28 x 28cm 40cm	R	58
Target HS20 £64	1 leg Excellent	This monopod stand can be used either filled or unfilled and encourages different characteristics in the speakers sound accordingly	19 x 16.5cm 53cm		58
Target T-40 £51	2 leg Very Good	Not very stable, tends to infer a slightly forward, ragged sound with diluted pitch	19 x 19 40cm		83 Supp.

EQUIPMENT SUPPORTS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE (H x W x D)	VALUE	ISSUE
Alphason R444 £120	Rack Good	A heavyweight structure with stressed MDF shelves, ideally suited to the Sonata turntable	82 x 60 x 39.5cm	R	83
Audioquest Sorbothane Feet £40 for four	Feet Good	These large gumdrops are very useful for damping vibrations in amplifiers and especially CD players.	6.5 x 2.5cm (circular)	R	57
Cornflake TCS6 £60	Shelf Good	A squat and rigid frame supports a Medite top board with four adjustable spikes, better suited to suspended sub-chassis turntables.	43 x 23 x 33cm		83 Supp.
Foundation Stable Table £100 (with Suppe)	Table Good	Similar to Stand Design's table though less well finished and certainly less stable	64 x 46.5 x 36cm		58
Origin Live Skyline Super £100	Table Good	An asymmetric table that helps provide a quick, lucid and solid sound with most decks	41 x 50 x 40cm	R	83
Roksan Equipment Table £169	Rack Good	An upgradable/expandable system suited to Roksan's Xerxes if not other competing turntables	65 x 52 x 38cm		58
Sound Organisation Table £55	Table Very Good	A deceptively simple structure that just happens to be engineered in a thoughtful, and ultimately successful manner.	37 x 45 x 35cm	BB	57
Sound Organisation Wall Stand £40	Shelf Very Good	The first of its ilk and still amongst the best, this simple framework represents a vast improvement over standard furniture shelves.	27.5 x 43 x 35cm	BB	57
Sound Organisation Z022 £97	Table Excellent	A small but costly table made from thin steel tubing, Suited to the LP12 but not other decks	49 x 45.5 x 36cm		58
Stand Design Duplex £75	Table Very Good	Well made and nicely finished, this table is broadly compatible with most heavy turntables	63.5 x 46.5 x 36cm	R	83
Target TT2 £64	Table Very Good	Standing up to the best in most areas, the TT2's only real foible concerns a slight loss of bass 'slam'. Design was updated in 1990	52 x 46.5 x 35.5cm	BB	57

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The Directory

TELEVISIONS

The standalone television set is rapidly evolving into a key component in integrated home entertainment systems

NICAM digital stereo sound is now being broadcast for many hours every week, although you will have to check to see what is available in your area. The IBA are quite open about it, but the BBC tend to be more secretive.

Most up-market stereo CTVs are now equipped with NICAM decoding and rather more attention is being paid to the built-in amplifier

and speakers.

NICAM is also available on Hi-fi stereo videorecorders (see above), and this is usually the more practical route for hi-fi system integration, as well as allowing favourite musical events to be saved on tape. To both watch and record with stereo sound will require NICAM on each of course, but the decision to update one or the other first will probably have as much to do with the age of the respective components than the convenience of the interconnections.

The ten CTVs tested so far are all luxury stereo models with 'flatter squarer' 59cms tubes of various kinds. Best suited to a viewing distance of about 7ft, these are one size up from the most popular 51cms size sets and take about 23 per cent of the top 30 per cent of the market.

All have remote control as well as Fastext (enhanced teletext), and many have on-screen graphics and flexible in/out socketry.

MODEL PRICE	LAB SOUND	COMMENTS	SCREEN SIZE, FEATURES	VALUE	ISSUE
Ferguson 5115 £499	Average Good	This nicely (monitor) styled set delivers a fine all round performance at a very competitive price. Ergonomics are better than most thanks to good on-screen graphics	51cm MP FST, NICAM, Fastext, OSG	R	86 Supp
Grundig ST-63-460TT £649	Average - Average +	Bulky set's shape resembles a square-rigged sail; screen tilts back slightly, so might suit floor mounting, though beware room reflections. Picture quality is good, if a touch bland, but ergonomics are fairly impenetrable - no on-screen graphics either. Halfway respectable sound quality is over-enriched by cabinet drone.	59cm FST, NICAM, Fastext		76
ITT Nokia £629	Average + Average -	Bulky square-rigged shape helps deliver a respectable standalone sound quality at a modest enough price. A versatile set with good handset but no on-screen graphics, the picture quality of our sample lacked fine detail resolution, lending a 'soft focus' effect	59cm FST, NICAM, Fastext		76
JVC AVS250 £500	Average + Average -	This compact and delightfully versatile non-NICAM set has respectable on-board stereo sound and lovely screen graphics, along with an infernal handset. Our sample suffered a tuner problem which marred a picture quality which was pretty good when monitoring baseband signals off tape.	59cm FST, Fastext, o/s graphics		76
Panasonic Prism TK-24 W1 £699	Average + Average -	Handsome but bulky set delivers serious standalone sound quality. Lovely ergonomics but off-air picture quality marred by tuner section noise on our sample (works fine as a monitor.) Good NICAM (SCART) output.	59cm FST, NICAM, Fastext, o/s graphics		76
Philips 9752 £500	Average Average +	Detachable speakers ought to be an asset, but those supplied are too cheap'n'cheerful. Picture quality is nicely balanced, if a shade 'soft', the handset is nice, but the on-screen graphics are a bad joke	51cm FST, NICAM, Fastext, OSG, S-VHS socket		86 Supp.
Pioneer SD-21AV1 £599	Average + Good +	The set that can do anything if you've the patience to find out how to drive it: fine picture, decent sound and good flexibility in a neat compact monitor package, plus a handset that deserves its own instruction manual	51cm FST, NICAM, Fastext, OSG/LED	R	86 Supp
Sony KVX 2132U £530	Average - Average +	This is an attractive, ergonomic and competitive package, trading picture resolution in favour of stability. The on-set sound is naff, so Trinitron fanciers should use it as a monitor alongside a hi-fi system	51cm Trinitron FST, NICAM, Fastext, OSG	R	86 Supp
Toshiba 217D9B £480	Average Average -	A superficially impressive looking package for the price, picture quality was disappointing on our sample	51cm FST, NICAM, text, OSG		86 Supp

VIDEO RECORDERS

For some time there's been a move to improve both the video and the audio quality of video recorders and TV sets alike as a necessary prelude to a proper integration between the two. Hi-fi video is obviously an important element in the story, and so is Dolby Stereo, the ambient 'surround sound' system.

The weak link of course is on the broadcast side. Although TV sound is well up to normal hi-fi standards, it has always been in mono and unjustly or otherwise has rarely attracted much audiophile interest. But TV sound is - or shortly will be - freed of the shackles of mono by the introduction of NICAM stereo. NICAM - an

acronym for Near Instantaneous Companding and Modulating - is the missing link that will help facilitate the much feted integration of video with audio. And then we have S-VHS, a system which does for picture quality what the other developments promise to do for the sound

MODEL PRICE	LAB SOUND	COMMENTS	SCREEN SIZE, FEATURES	VALUE	ISSUE
Akai VS-75EK £550	Average Good	Excellent performance and a slick set of controls make this recorder a pleasure to use. Good price is a bonus	Hi-fi, NICAM, programmable remote	BB	71
Akai VS-967EK £500	Average Good	Many well implemented facilities, but unsuitable for dedicated audio use due to lack of LP mode, manual record levels or audio input	Hi-fi, NICAM, on-screen programming	R	86 Supp.
Grundig VS680 £1250	Very Good Average	State of the art technology gives top notch sound with tremendous flexibility but somewhat disappointing picture quality. It's also very hard to drive	Hi-fi, NICAM, LP/SP, teletext programming, on-screen titling & graphics		86 Supp.
Nordmende V4405K £549	Good Good	Fine basic sound and picture quality, but the RF converter introduced significant losses. An excellent model, but configured for German home market. The recorder lacks NICAM	Hi-fi, transmitter handset, digital FX	BB	71
Panasonic NV-F65 £500	Good Average	Uninspired but competent and well made deck. Plenty of features, decent sound and reasonable video ensure recommendation	Hi-fi, NICAM, LP audio only, bar code programming	R	86 Supp.
Panasonic NV-FS1 £1000	Poor Good	The control system is poorly organised, with cramped legends and some strange machine logic. Bar code programming is hardly a great achievement either. Picture and sound quality are good, but not state of the art	S-VHS, Hi-fi, NICAM, bar code programming	R	71
Philips VR-6585 £500	Average Average	Fine middle-ranking deck with full LP operation and easy controls and displays	Hi-fi, NICAM, transmitter LCD remote, LP/SP		86 Supp.
Sanyo VHR-D4890E £1000	Poor Excellent	High grade S-VHS recorder with digital effects which gives first rate screen-based results but relatively poor sound recording	Hi-fi, NICAM, S-VHS, PIP etc		86 Supp.
Sharp VC-S1000H £1000	Good Poor	Clean, accurate and stable off air and from tape, and LP modes are satisfactory - but on-screen S-VHS results are well below par	Hi-fi, NICAM, LP, S-VHS, titling		86 Supp

The Directory

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

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

Then come the ratings for the standard achieved in laboratory and listening tests, with the exception of certain product groups where lab tests were not carried out. One important point to remember is

that they cannot be used to compare products from different categories - for example a cassette deck rated 'excellent' in sound quality will not usually offer the same standard of fidelity as a similarly rated turntable or CD player (unless you can get hold of first generation copies of the master tape!)

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

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

Specifications vary with product type

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

Perhaps the most influential letters in the *Directory* are those found in the Value column, the Rs and BBs denoting the Recommended and Best Buy ratings that are appended to products we consider meritworthy. The Best Buy tag means that a product not only offers good sound quality but is reasonably priced as well. With source components a price limit of approximately £300 is usually used as a guide. Recommended means that either the performance of a product is particularly good irrespective of price or, alternatively that a good value standard is achieved but overall attainment falls short of Best Buy classification. An ideal situation would be to choose suitably priced Best Buy or Recommended products from relevant categories and create a Best Buy system, but, due to the variety in tonal balance that exists in much audio equipment

(especially the electromagnetical elements - that is to say the cartridge and the speakers), system building is unfortunately not quite that simple. These ratings make a useful guideline for shortlisting components, but only experiencing the actual combination will tell you whether it works for you.

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

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

SYSTEM BUILDING

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

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

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

There will always be controversy over the relative qualities of LP, CD and cassette. LP is still the choice for ultimate sound quality - particularly for those prepared to spend a substantial sum on a good quality turntable system.

Cassette has never really challenged vinyl's superior quality, but it is a multiple role format, offering 'go anywhere'

flexibility, a uniquely useful recording capability, plus a broad catalogue of prerecorded music cassette material. As a hi-fi medium cassette suffers from prerecorded material which has been improving but is still patchy in quality, and can usually be bettered by a home recording. There is also the worry that a tape made on a specific machine usually plays best on that machine, which may cause aggravation when upgrading a few years hence.

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

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

For many years the 'weakest link' theory proposed that the loudspeakers needed the most attention, that amplifiers merely had to have sufficient power, and that turntables were pretty well perfect. However, this perspective has become steadily discredited by an alternative 'theory of precedence', which stresses that

no subsequent component can make up for the inadequacies of its predecessors - all it can do is supply its own additional degradations. In such a context it is not uncommon to find more than half the system budget allocated to the record player, with scrimping and saving made on amplifiers and loudspeakers.

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

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

The loudspeakers are most critical of placement, because it is their job to create the stereo image, and it will be impossible to do this if the sound from each is not roughly similar at the listening position. Each loudspeaker should operate in a similar immediate acoustic environment, unencumbered by other furnishings and

structure, and a similar distance from each listener, nearby walls, and corners. Some loudspeakers are designed to operate close to a rear wall, others a metre or so out into the room, but all loudspeakers benefit from being closely mechanically coupled via proper stands to the floor.

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

The key to getting the best results from a separates system lies in finding an experienced and skilled dealer in the first place, one who takes the trouble to find out what you really want and then demonstrates some likely alternatives.

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

Personal Messages

What exactly are speaker stands supposed to do? Paul Messenger get to grips with spikes, Blu-tak, glass and slate.

I first promised to take a look at loudspeaker stands many months ago, but have left the threat poised ever since, largely through a realistic appreciation of my own ignorance.

What I don't have are glib solutions to individual problems. Regretfully there's no coherent thesis that ascribes effect to cause and ties everything neatly together in a logical fashion, merely a number of somewhat random observations that have accumulated over a year or more.

Six months or so ago I contentiously stated that the support under a turntable was as important as the turntable itself. It's an opinion I still hold, and am now convinced it applies equally to loudspeaker stands. I'm also convinced that we've barely started to find out what these can achieve.

Chaos theory

The root of the whole problem is that all is empiricism. There's no defined rationale about what a speaker stand ought to do, apart of course from the simplistic need to keep the speaker 'rigid' and place it at the right height for listening. (And as is perfectly obvious from tonearms, turntables, cartridges and loudspeakers themselves, there's no such thing as rigid. Materials just aren't capable of coping with a three decade variation in vibration frequency. The same applies to our loudspeaker stands.)

Beyond that, theories abound. Most make a certain amount of sense in isolation, but one will frequently conflict with another, because each designer is pursuing his particular hi-fi odyssey.

Heybrook's Peter Comeau refers to transmitting cabinet energy out of the speaker cabinet down into the floor

itself, whereas Foundation's Cliff Stone seeks to absorb this energy within the stand and its cocktail of fillings. Some seek to minimise energy storage by lightweight construction, others attempt to mass-load the speaker enclosure. Some couple with spikes, others employ Blu-tak or Black-tak. It's enough to make someone trying to scratch a living reviewing loudspeakers take up something simple and straightforward, like astrophysics.

Switch the method of coupling a loudspeaker to a stand and you substantially modify the sound, for good or ill. Switch the stand itself, and you may as well have changed the loudspeaker, such can be the magnitude of the change. The same may well apply between wooden and concrete floors, but having never enjoyed (or endured) the latter, I can't really comment.

Over the past year, whilst drastically refining and tweaking the front end of my system, I have also been investigating the supports underneath my *Isobariks*. There's not a lot of stand choice for 'barik owners, and for many happy years I've used Sound Factory's heavy tubular steel frames, spiked downwards into floorscrews and upwards into small crosshead screws inset into the base of the speakers.

The result remains a fine all round compromise, capable of shaking the floor pretty effectively and sounding fast and pretty coherent overall, to the point where a single loose lock-nut is quite enough to destroy the whole focus.

Out of interest, I ordered a pair of Foundation's *Isobarik* stands, which stopped much of the speaker vibration passing into the floor. However, some of the speed and liveliness seemed

to be taken away too, so these have gone into the pending tray for the nonce, and Cliff may pop round to tinker with the filling sometime.

I still haven't got around to trying Linn's own revised stand, but just before the latest deluge of review loudspeakers, I got hold of a prototype Mana *Isobarik* stand that transformed the system sound as dramatically as that company's turntable stand did a year previously.

Glass base

I had a few qualms over the prospect of lowering a 40+kg speaker onto a sheet of glass sitting on four steel spikes (held in a spiked-to-floor angle iron frame). I started by placing the speakers onto four little steel nuts placed above the spikes on the glass surface.

Results were astonishing. On some tracks I had to back off the volume for fear of damaging the structure of the building. Not only was far more energy across a much wider bandwidth being transmitted into the floor, but the loudspeaker too seemed to be trying to shake itself to pieces. The sound was awesome, with a scale and low frequency extension (though not level) that seemed comparable to the new Naim *DBL*.

Unfortunately there was also an unpleasant upper mid hardness that made long term listening fatiguing. I changed the steel nuts for Linn's nylon feet and things softened back nicely - but lost some of the earthquake factor and speed at the same time. At which point time ran out and I had to turn my attentions to twenty five other pairs of rather smaller loudspeakers.

Slated

During this project the most intriguing stand experience was the way the Slate Audio stand utterly transformed the

performance of both Celestion *SL6Si* and Meridian *Argent 2*, from dull and congested to open and transparent. The subjective effect of the Slate seems to be to brighten the presence and lower treble whilst also dramatically improving the focus and coherence, and somehow reducing mid-bass 'clogging'.

There's a paradox, however. Although the Slate seems to 'speed up' slow loudspeakers, it also seems to 'slow down' the fastest ones. And I'm also at least half convinced that it adds a measure of its own colour and smearing in the bass region.

But I've had some most interesting results from placing a small sheet of thick (7mm) glass between the Slate's three little aluminium domes and the base of the speaker itself. This seems to improve focus and coherence and reduce boxiness still further, though I'm still not sure about the bass.

There's no space left to speculate on the causes or effects involved. There's probably a different optimum combination of slate, steel, spikes and glass for every loudspeaker on the market. Discovering them should keep hi-fi tweekers busy for the next decade.

The final word comes from a post listening test wind-down, when three of us were giving a pair of Royd *Sintras* some real stick with some favourite records. I changed the stands from Linn *Kans* to Foundation *Designers* and jaws dropped all round. But whereas I preferred the *Kans* for their speed and low frequency bounce, coloration notwithstanding, both the others voted firmly for the extra control and much improved imaging of the Foundations. *Chacun a son goût*, as some Frenchman (presumably) once said.

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