

# HI-FI CHOICE

THE WORLD'S NUMBER ONE GUIDE TO BUYING HI-FI

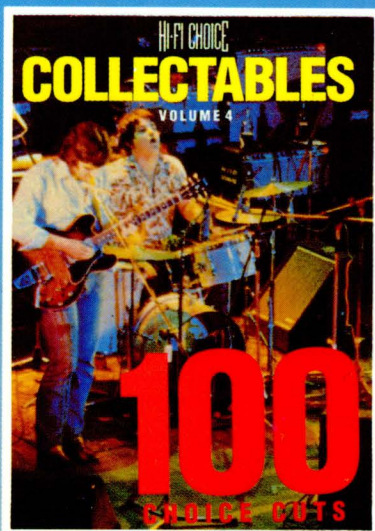
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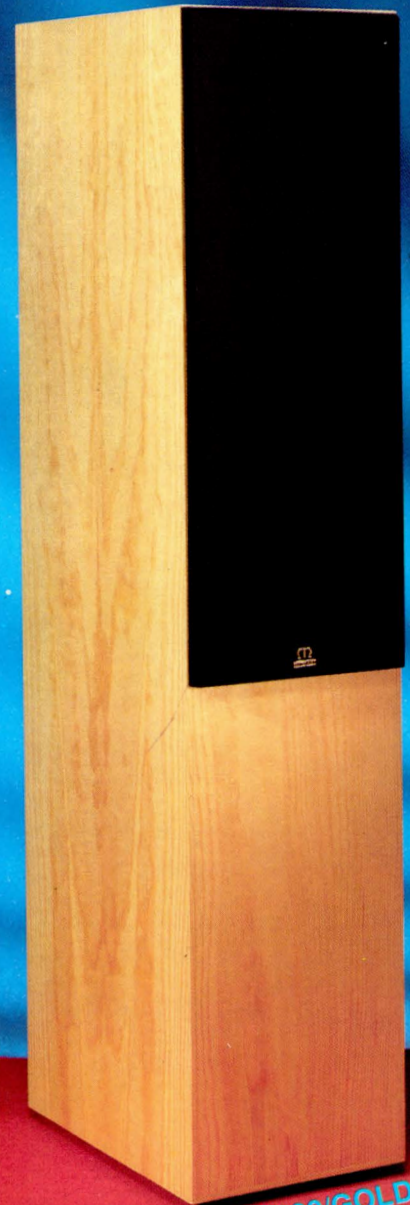


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THE WORLD'S No. 1 GUIDE TO BUYING HI-FI  
**HI-FI CHOICE**  
ISSUE NUMBER 78: JANUARY 1990

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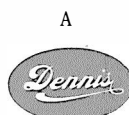
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## MENU

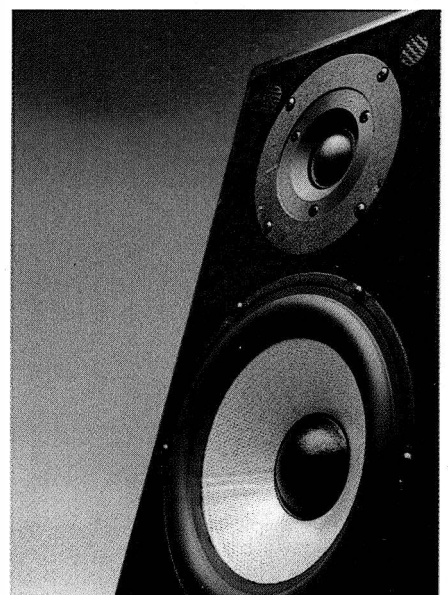
In a year when high interest rates and reduced consumer spending on luxury goods have caused many long faces in the hi-fi industry, the UK's major producers of loudspeakers have nonetheless announced record sales figures over the last 12 months. Of course, much of this success is down to strong export markets, while the value of sales in the UK seems to be holding ground primarily because hi-fi buyers are spending more money on *better quality* products than ever before. Our *Market Response* investigation on page 44 gives a fuller picture.

*Choice: Loudspeakers* has always been a popular issue with our readers. Could it be that when looking for ways to improve the sound of their systems many hi-fi enthusiasts prefer to swap and change the loudspeakers rather than the amplifier or source components in the system chain? Our reviewers would advise that before deciding to change your existing speakers you should first ensure you're getting the best possible performance from them. At best, all a loudspeaker can do is reproduce the signal with which it's fed by the preceding components in the chain – however, experimenting with the placement of speakers in the listening room can drastically alter the perceived sound. There's also the vexed question of which stands to use to support the loudspeakers at the correct height. Paul Messenger has more to say on this on pages 47 and 115.

Elsewhere in this month's issue we've the concluding reviews from our latest valve amplifier tests, a visit to the home of world snooker champion Steve Davis (what a fabulous record collection he has!), and the opportunity to send off for a **free** SKC C90 chrome tape. Simply fill in the form on page 35.

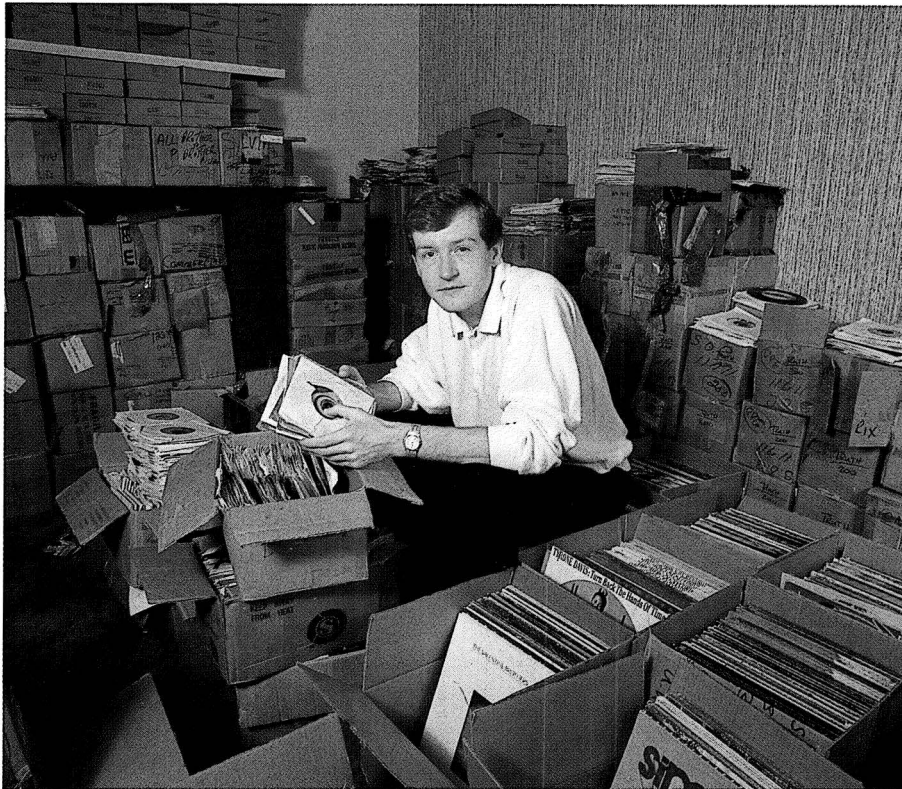
While on the subject of free tapes, doubtless many regular *Choice* readers noticed our mistake in last month's issue. Throughout the magazine we referred to the free gift mounted on the front cover as a JVC C90 cassette – only it was a C60! What happened was this: JVC was supposed to be sending us C90s, but the shipment of tapes didn't arrive on time so we were offered higher quality formulation C60 tapes instead. This was all well and good – at *Choice* we're far more interested in *quality* than quantity – but unfortunately by this time the December issue had already been printed. We apologise for any confusion this may have caused our readers.

*John Bamford*



Cover photograph of the  
*QLN Signature*  
(see page 95)  
by Chris Richardson.

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*This man says he knows his way around his record collection. Steve Davis (top) is interviewed in Aspirations. And this month we concentrate on loudspeakers, including KEF's C95 (above) – plus there are more of those gorgeous valve amps (right).*

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### READERS WRITE/CHOICE ANSWERS

Gotta problem? If it's hi-fi health that's worrying you, a component is making you sad, or you're looking for a new musical partner, then let us know.

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### CHOOSING AND USING LOUDSPEAKERS

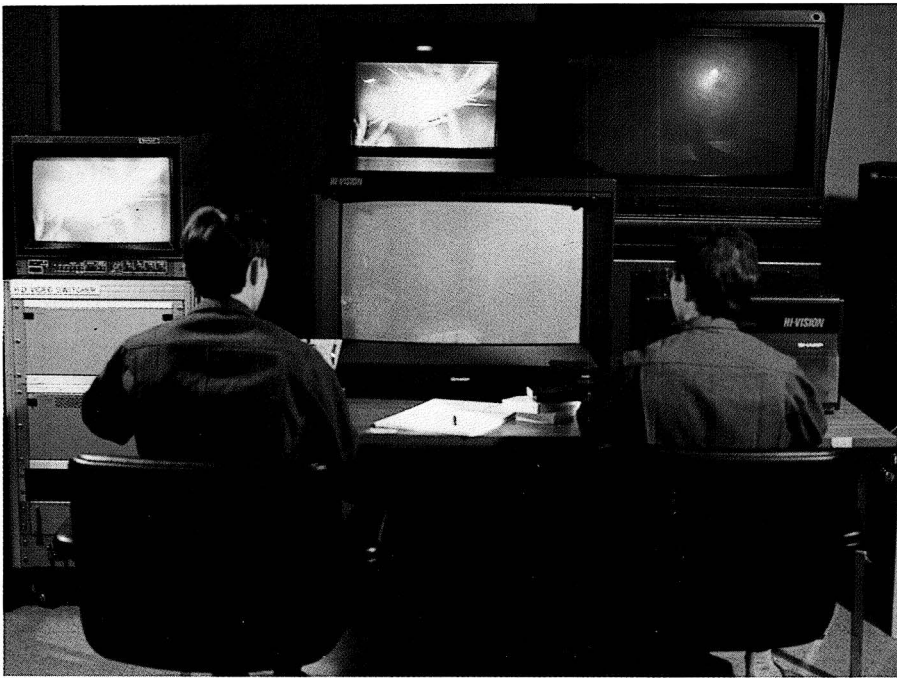
Paul Messenger has chosen and used a good deal more than most, so let him guide you to successful selection.

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### LOUDSPEAKER REVIEWS

Paul lifts, grunts and shuffles his way through another mega-test – 31 models this time around.





Is this the end of 'square eyes' (left)? Paul Messenger discusses televisual advances. On its tenth anniversary the Sony Walkman is a midget compared to early models and enjoys healthy competition (bottom).

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**QUANTUM CABLES OFFER**  
 Improve your signal path with this range of superb cables.

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 Can CD really play tunes? Paul Messenger has been listening to a prototype player – Blu-Tak'n all.

**FREE TAPE**

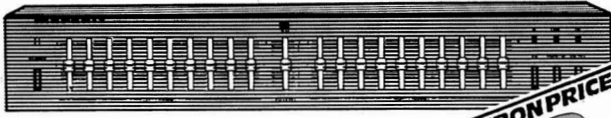
**35**  
 SKC is offering 2,000 *Choice* readers the opportunity to try a QX C90 chrome cassette – absolutely free! Fill in the form on page 35 today!



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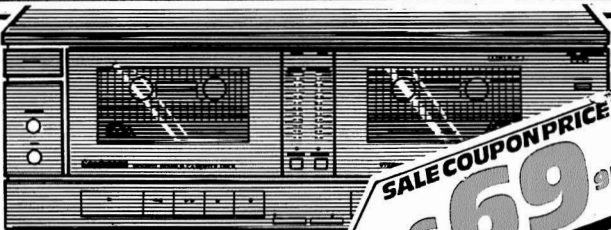
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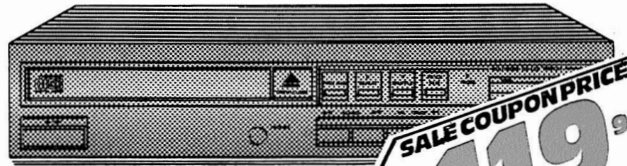
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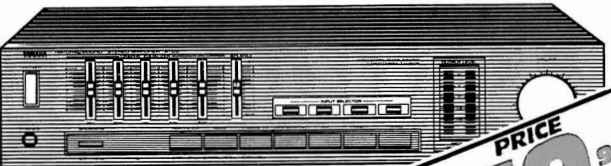
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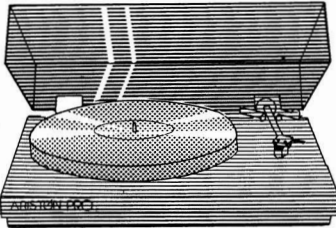
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*What Hi-Fi? Magazine*



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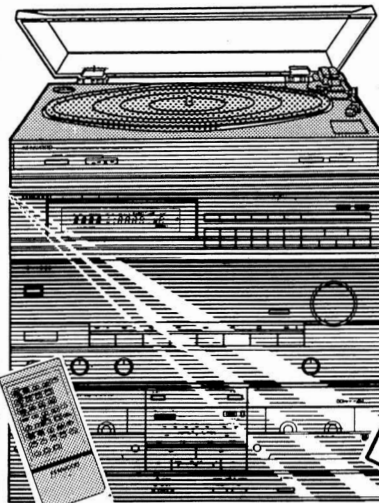
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Hitachi SSW50 SW	£39.95pr.
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Behind its titanium finish, the XL Z1010 also features an 8 times oversampling digital filter.

It eliminates unwanted high frequencies and

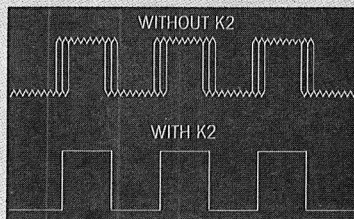
produces a more accurate phase response.

In pursuit of utter purity, this fully featured machine has yet another innovation: a quadruple full time linear 18 bit digital-to-analogue converter.

It ends forever the sharp, metallic sound that's so often associated with Compact Disc.

The XL Z1010. From the JVC Super Digifine series of hi-fi components.

As for that well-worn phrase, 'all CD players sound alike', we invite you to be the judge.



SONICALLY, THE DIFFERENCE IS CLEAR.

**JVC**  
FOUNDERS OF THE FUTURE





## TECHNOLOGY

### CDs OVERTAKE LPs

For the first time sales of compact discs are overtaking long playing records according to record industry figures. In the period from April to June 1989, 8.7 million CDs were sold (to shops) compared to 8 million long playing vinyl records. The volume of CD sales has leapt a massive 69 per cent from the same period last year. However, over the whole year vinyl is still ahead with 48m LP sales compared to 34.8m CD sales. Yearly CD sales are up 56 per cent whereas vinyl sales are seven per cent down on the previous year's figures – both in terms of value and volume. And although more LPs were sold, the vinyl market is worth £139.3m as opposed to CD's £193m value.

Sales of pre-recorded cassettes are also rising – by 14 per cent in terms of volume, and by 43 per cent in value – we're now spending some £243m a year on musicassettes. Singles – vinyl, cassette and CD – are down one per cent to 61.1m. CD singles account for just six per cent of this market. The British Phonographic Industry, which produced the above figures, says that total software sales are rising by 16 per cent in value, which is at the same rate as last year.

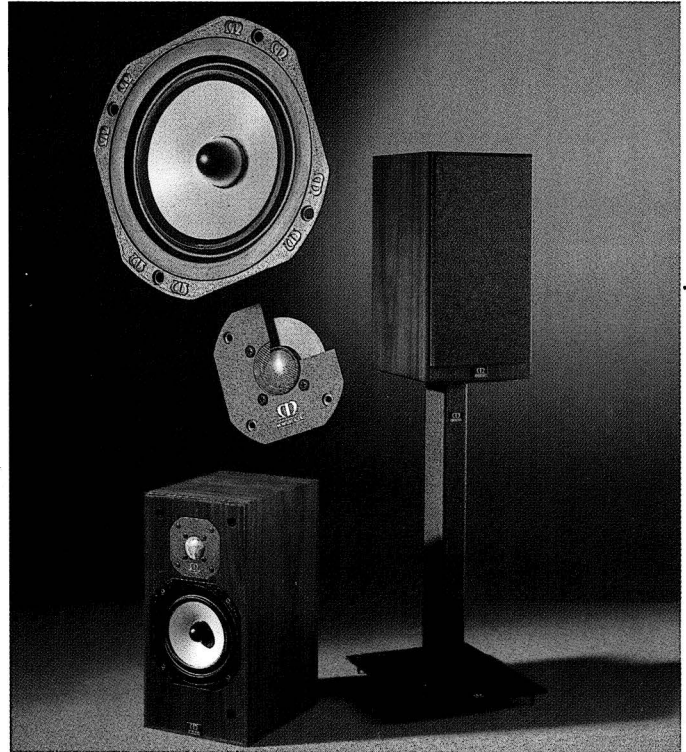
CD players are now being used in 14 per cent of UK households according to the British Market Research Bureau's FORTE Report. As might be expected BMRB found 'a southern bias' in the incidence of CD players and estimates that 22 per cent are being bought by younger (20-24 year old) adults.

## PRODUCTS

### TUNING MISSION ACCOMPLISHED

A remote control audiophile AM/FM tuner is a rare bird but one has arrived in the Mission Cyrus range. Two years in the making the Cyrus tuner has 59 FM and 59 AM presets and has been designed to match the Cyrus range of amplifiers (it's 215mm wide). The tuner comes with its own 38 page handbook in French, English and German, detailing everything from correct positioning to use of the 22-key remote control pad. Finish is grey or black and price is £299.

Mission also has launched its new flagship loudspeaker in the UK – the 767 – labelled as a state-of-the-art semi-active system. Standing 140cm tall and weighing 75kg the 767 uses two bass units (locally driven) and two mid-range units with a 25mm tweeter to 'set a new standard for the hi-fi industry'. The five-way gold-plated binding posts allow



*Metal bass and midrange from Monitor Audio with the new standard 'gold' tweeter.*

for conventional, bi-wiring or bi-amping use and the speaker comes in black ash, rosewood, mahogany or piano black finishes priced between £2,000 and £3,000.

### MOVING METAL

In its never ending quest to develop new and exciting products with which to tempt the audio consumer, Monitor Audio has developed a metal bass midrange driver to complement its gold dome tweeters. The company has come up with a pressed aluminium cone of 165mm diameter which is anodised with a ceramic coating to increase stiffness.

The cone is thermally coupled to an aluminium voice coil and acts as a heatsink, dissipating the heat built up by the resistance of the coil. The first model to incorporate the new driver is the *Studio 10* which at 40 x 20 x 25cm is a little smaller than the *852* but costs a hefty £1,000. Sensitivity is a reasonable 88dB. Hefty in a more conventional sense are the complementary stands which weigh in at 30kg and cost a cool £300.

## BUSINESS

### COMET SWALLOWS LASKYS

The hi-fi and consumer electronics chain Laskys has been bought by Comet in a move which effectively sounds the death knell on the Laskys name. Granada, which owned Laskys, sold the 58 store chain to Kingfisher, which owns 310 (and counting) Comet stores, for £3.6m plus £5.3m debts. Laskys apparently had a book value of £9.9m and property recently valued at £3m but both sides appeared delighted at the transaction. "We were losing around £2m a year and the prospects for the future were even worse than that," said Graham Wallace for Granada, which has now decided to concentrate on the highly profitable rental market with the Granada and Visionhire names. Granada has also ceased dealing in consumer credit with existing business now handled by Club 24.

All but one of the Laskys shops have changed to the Comet name



*Mission's remote control tuner.*

and will now sell white goods (fridges, microwaves, etc) as well as brown goods. The Tottenham Court Road branch of Laskys remains unchanged at present because of its very high profile in the hi-fi and brown goods sector according to a spokeswoman for Kingfisher. While the move may delight some independent hi-fi specialists, many of whom were in competition with the Laskys *Elite* range, it is also cast iron proof of plummeting sales figures in the hi-fi market generally. And while Comet says it plans no staff changes the buy-out will undoubtedly reduce public awareness of hi-fi as a specialist market; you cannot listen to loudspeakers while someone is testing a hairdryer.

## PRODUCTS

### FAITH IN VINYL

Reflecting a market preference for better quality turntables Thorens has come up with a £600 model which it has optimistically called *TD2001*. The suspended sub-chassis belt-drive deck is a revamp of the longstanding *320*, using an 'improved arm', the *TP90*, and a heavy (3.1kg) zinc alloy platter. Speed changing between 45 and 33 rpm is electronic using a switch on the plinth. *2001* is finished in black veneer.

### SONY'S METAL AGE

Sony recently anticipated the new decade by holding a London seminar to announce the 'New Metal Age', while launching a couple of highly significant tapes and a new 'better than broadcast' component-video camcorder format. To get the latter out of the way first, *Hi8* is to standard 8mm video what S-VHS is to standard VHS (whether C for compact or not), and it uses the very latest thing in tape coating technology – metal evaporated – in order to press home the format's performance edge.

As far as analogue audio signals are concerned, metal evaporation techniques are inappropriate, the very thin coating being quite unsuitable for low frequency signals (though some ME tape is used to give extended play on micro-cassette dictation machines). However, there's never been much doubt that metal-particle tape potentially offers a very worthwhile performance advantage over ferric, chrome or Co-Fe tape formulations.

Potentially good or not, metal



*Will it last 12 years? Thorens' 2001.*

particle tape has failed to make any significant impact on the UK market after ten years of availability, sales volumes currently running at around one per cent, down from a historic high of three per cent. This is because the early product was underdeveloped, and the hardware was even less well prepared to accommodate the high head currents needed to take advantage of this ultra-high bias and signal magnetic formulation.

The last couple of years has seen metal-specialist brand That's making most of the metal running, and now Sony is adding its very considerable weight behind these Type IV tapes. But much more important than any hype, the entry price is starting to come down at last, with average trade prices having dropped 11 per cent over the past year.

Sony's key new *Metal XR* contender was launched in November at £2.69 (C90) (available in several lengths). It's a conventional single-layer tape, yet reductions in particle size and improved dispersion techniques deliver a dynamic range performance remarkably close to the much more expensive dual-layer Metal-ES,

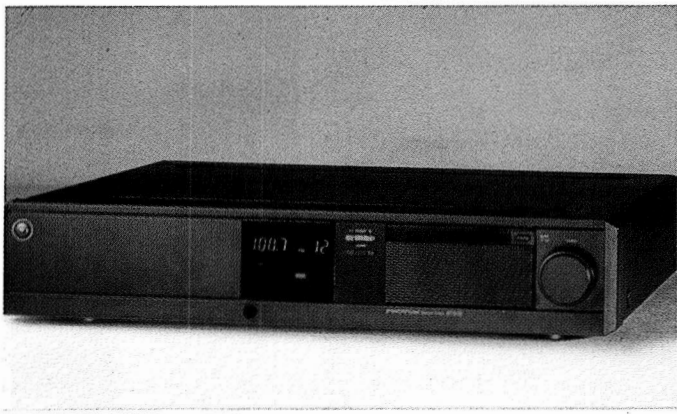
at a price only £1 more than a premium Type II (chrome) tape.

### PROTON PRESENTS

For its two new ranges of audio equipment Proton called in the services of Chicago industrial designer Rheinhold Weiss, who has revamped the product's style with the likes of motorised sliding panels to hide controls.

The more expensive *600* series consists of an integrated amplifier (the £450 *AM656*), remote-control tuner (£350 *AT-670*), auto-reverse cassette deck (£500 *AD-630*) and 16-bit four times oversampling CD player (£450 *AC-620*). All models are remotely controllable and have motorised panels.

The *AM-656* amplifier includes an Aphex *Aural Exciter* (often used in professional equipment) which is said to improve clarity and presence when taping. Other features include the *Schottz II* tuner circuitry – giving better sensitivity, selectivity and overload handling – which is used in both the new tuners. The *400* series boasts two amplifiers – the £200 *AM-455*, and £150 *AM-452*, a £170 tuner (*AT-470*) and the £250 *AC-240* 16-bit, two times oversampling CD player.



*New Proton styling with the AT670 tuner.*

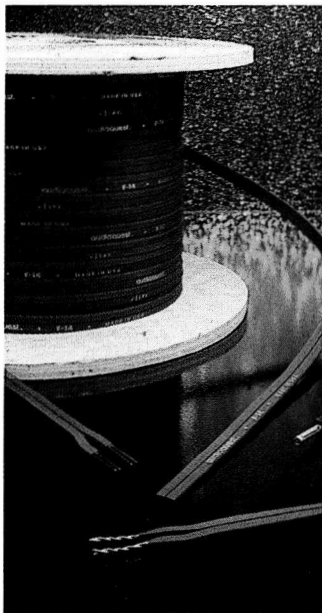
## NOT A LOT OF DOSH, TOSH

Toshiba has announced a new audio range out in time for Christmas. Five CD midi systems are available at prices starting around £250. The top of the range *V39CD* model is made up of 'separate' components and costs £499.

Portables come in the form of a yuppie (£199) and a ghetto (£79) blaster and there are ten personal stereos to choose from priced from £20 to £80, depending on how much you are prepared to pay for build quality and features.

## ALL FOR ALPHA

Arcam continues to assail the competition with the introduction of a new loudspeaker which completes the Arcam Alpha system line-up. The £199 Alpha loudspeaker has been designed to complement the Alpha CD player, amplifier and tuner which retail together at £895. The two-way 'speaker uses a 200mm polypropylene mid/bass driver and 25mm 'soft-domed' tweeter set in an 18mm Medite baffle. The rest of the



*Solid and flat Audioquest cable.*

cabinet is made of internally braced 15mm board. Sensitivity is a claimed 89dB and the 46cm high cabinets can be used on a bookshelf or (preferably) stands sited close to a wall.

At the same time Arcam has introduced Audioquest's *F14* flat loudspeaker cable in the UK at £1.95 a metre. *F14* is insulated in dark blue PVC and uses a solid core oxygen free high conductivity copper which can easily be fitted to binding posts or amplifier spring clips.



Fill it up on Sunday – it plays all week: Philips equivalent of the Winchester repeating rifle.

## TAKE A SIX PACK

Responding to the demand for non-stop digital music Philips has developed a six-pack compact disc player. The (16-bit four times oversampling) *CD586* uses a six-disc magazine to provide users with up to seven hours continual play. The player will also provide its own random selection or you can remotely programme up to 30 tracks from the discs in the magazine. Philips' own 'Favourite Track Selection' facility also allows you to permanently programme your choice of tracks on a library of up to 227 CDs. The player accepts full or single-size CDs, is remotely controllable and costs £230.

Philips also has three new standard CD players all featuring 16-bit four times oversampling technology with twin digital to analogue converters. The *C6* range (*CD610*, *CD620* and *CD630*) offers addition and refinement of features and facilities to complement price increases from £160 to £250.

## HIGH-END LINE

Audio Concepts, a relatively new name in high-end hi-fi, has given us details of its full import line-up. Mentioned briefly in our Penta Show report, Concepts has been founded as an upmarket distributor by Paul Whitehouse who also runs Soundtec Marketing. Nine loudspeaker models from the DCM Corporation in Michigan (USA) are imported from the £209 *Time Piece* to the £1,259 *Time Window Three* (love that name). All are made from solid oak with walnut veneer. The Californian Mark Brasfield's hand-made CD players, the *MS Brasfield Gold* and *Silver* are due to arrive before Christmas priced around £2,200 and £1,000 respectively. And there are the Air Tight valve amplifiers from Japan priced £1,769 for the *ATC-1* preamplifier and £2,059 and £3,679 for the *ATM 1* and *ATM 2* power amps.

As if that isn't enough Audio Concepts is also importing Muse Electronics amplifiers from California. Three of these are on offer – the £1,339 *Model One* preamplifier, £889 stereo power amplifier (*Model 100*) and the *Model 150*, a £849 monoblok. There is also the *Tri-Planar II* precision tonearm from Wheaton Music, based in Maryland, Stateside. That costs a mere £1,649.

## BUSINESS

### EXIT AMSTRAD

After 20 years of manufacturing audio goods Amstrad is to shut down its Shoeburyness factory with the loss of 150 jobs. Amstrad's reason for the decision was that the group's audio interest was "not giving the return we need". PR spokesman Nick Hewer told *Choice*: "Audio is a very fashionable market, you

have to keep changing the products every season. We weren't losing money but it's no longer an area we want to be in." Production on the present range will cease at the end of December. Amstrad now sees itself as more computer oriented and also has its well publicised work in satellite receivers (of which it claims to be building 500,000 a year) as well as video recorders and camcorders.

The company's audio products were always aimed at the mass end of the marketplace with very little 'returning to upgrade' business. This, combined with a reluctance to invest in research and development in the face of intense competition, led to the conclusion of the Amstrad board on October 17th.

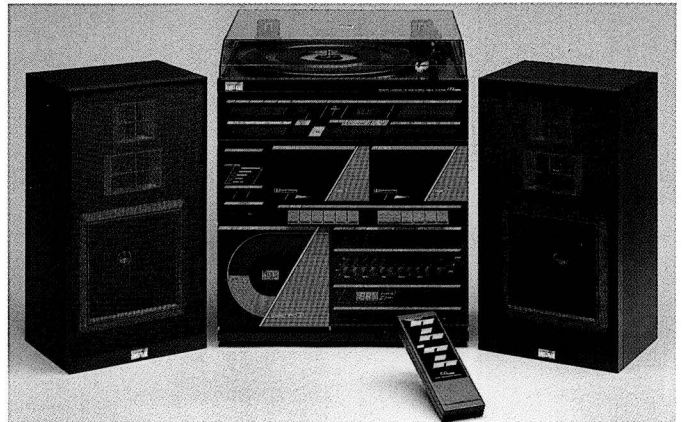
Existing guarantees on Amstrad equipment will be honoured; 45 staff have been retained at the audio factory – though this doesn't mean they will all be employed repairing faulty goods!

## INCATECH IS REBORN

"Get on the bus, get off the bus." Amplifier maker Incatech has re-emerged after ceasing trading earlier this year. Colin Wonfer, Incatech's designer, had a brief dalliance with Oxford Acoustics, helping to design the OAC range of amplifiers with OA's MD Dr Fraser Shaw. Differences between the two has now resulted in Wonfer's leaving OAC and teaming up with John Ogden and Russell Kauffman of Studio Power (loudspeakers) fame.

Incatech Ltd is the new firm and two amplifiers – a Class A pre-power combo and an (around £300) integrated model – are planned for the new year. The deal allows Wonfer to get back into business using Studio Power's administrative backing while helping to design a new more upmarket range of SP loudspeakers. Incatech Ltd will now honour guarantee

Now you see it, soon you won't: Amstrad Audio.



## IN BRIEF

Specialist dealer chain, AT Labs is organising a hi-fi show at the Gloucester Hotel, London SW7, in February 1990. 'Audio 90' promises all the major brands and will run over the weekend February 2nd-4th.

Avondale Audio is planning an open day at the Chesterfield Hotel, Malkin Street, Chesterfield, on Sunday March 25th. Exhibitors include Concordant Audio, Grant Amplifiers, Lynwood Electronics, Nottingham Analogue Studio and Audiokits. The day kicks off at 10.00am and admission is free. Details: (0246) 200096.

Marton Music is a new high-end specialist at Fareham in Hampshire offering home and studio demonstrations of the likes of Townshend, Kelvin Labs, Marantz, and TDL equipment. Some 'cheaper' brands such as the Systemdek turntables are

also offered. Contact Tony Seaford: (0329) 231773.

Loudspeaker and turntable manufacturer Alphason has a new address at Unit 2, Linstock Way, Wigan Road, Atherton, Greater Manchester M29 0RL. Tel: (0942) 897308.

Woodside Electronics' valve amplifiers and CD player are now available at Actongate Audio, Wrexham, Clwyd. Tel: (0798) 364500.

Voyd turntables have increased in price. The *Valdi* now costs £680, the *Voyd* £1,099, and the *Voyd* with split phase power supply is £1,319.

Wadia digital-to-analogue outdoor converters are now handled by Acoustic Energy, London W13. Wadia had been distributed by Musical Paradigms, of Woldigham,

Surrey, which continues to deal with VTL amplifiers and DyneAudio loudspeakers.

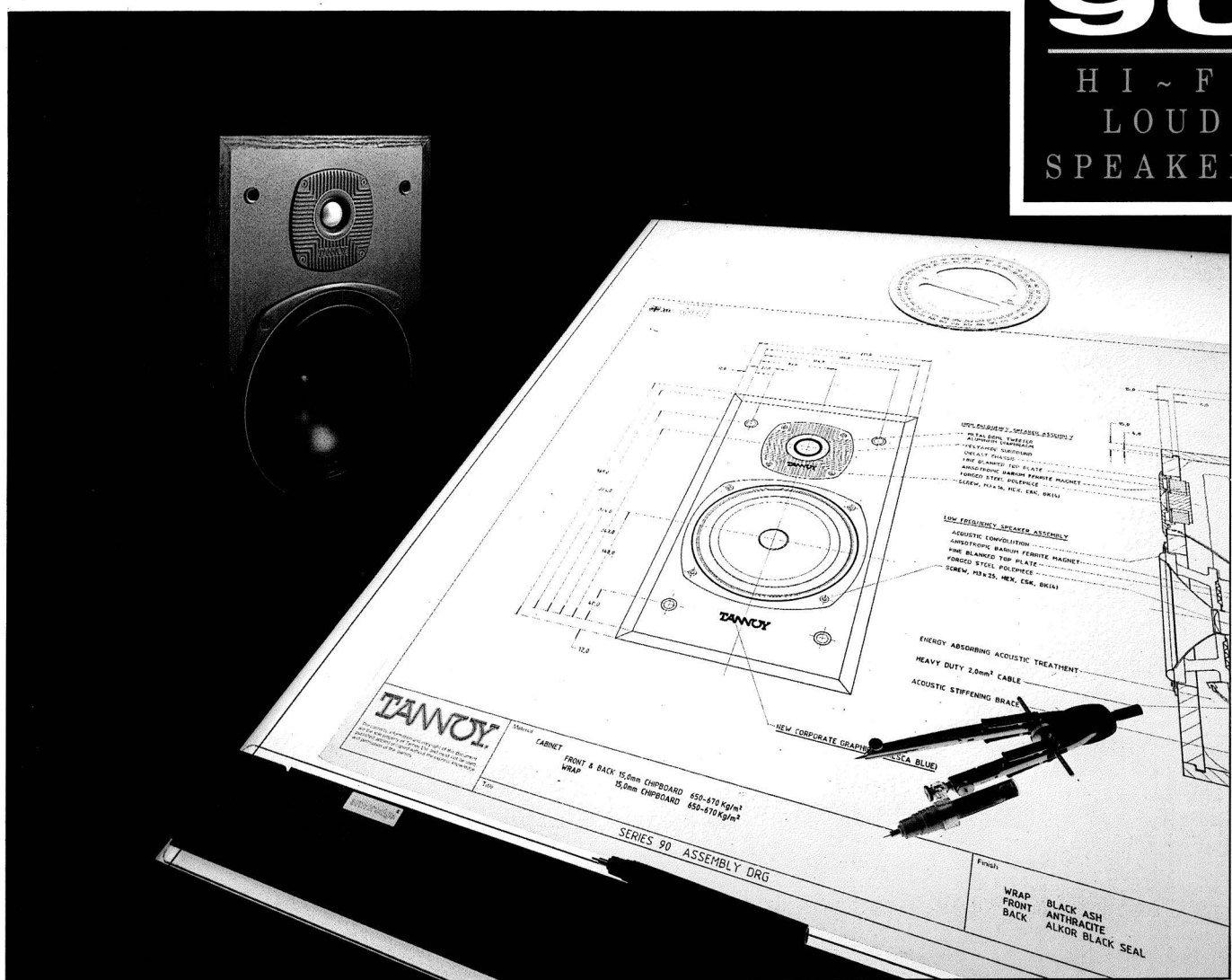
Hinari, Scottish-based maker of televisions, video and audio equipment, has been bought by Alba plc which owns the Bush brand of consumer electronics. Hinari was under administration and the sum paid by Alba has not been disclosed.

NVA has replaced the *AP30* integrated amplifier with a new model, the *AP40* which offers '40 odd watts' for £350. The company also has a budget model called the *AP20* in the pipeline which will sell for £230.

WH Smith is selling its own brand of compact cassette which has been developed by That's Tape. Packs of three or five consist of a Ferric, Super Ferric or Super Chrome versions with three of the latter C90s selling at £4.99.

**THE STORY SO FAR... DC1000** "THIS IS ONE OF THE MOST EXCITING, ENGAGING AND REFRESHING DESIGNS I HAVE COME ACROSS IN RECENT TIMES" **HIFI ANSWERS**, MARCH 1989 • **DC2000** "HIGH WONDERFUL AND EXTREMELY RECOMMENDED" **C.D REVIEW**, MAY 1989 • "THE TANNOY IS AN EXCEPTIONAL LOUDSPEAKER, ESPECIALLY GIVEN ITS ONE IRREFUTABLE HANDICAP - IT'S SIZE" **WHAT HIFI**, JUNE 1989 • **DC3000** "GO ON, FIND A DEALER AND LISTEN TO WHAT THE DC3000 HAS TO SAY. YOU'LL FIND IT A SEDUCING EXPERIENCE" **HIFI ANSWERS**, AUGUST 1989 • **M15** "I FOUND THE M15'S PRESENTED A WELL DEFINED, WEIGHTY AND - MOST IMPORTANTLY - INFORMATIVE SOUND" **NEW HIFI SOUND**, AUGUST 1989.

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agreements and servicing on the original *Claymore* and *Sabre* amps from its base at 26 East St, Rochford, Essex. All telephone enquiries go to Studio Power: (0943) 870057.

## BRITISH BASE FOR BOSTON

Boston Acoustics has set up its own UK company, taking over distribution and marketing of the Boston bookshelf and flush-fitting loudspeaker range from Hi-Fi Markets.

BA has been handled in the UK since 1983 but considers the marketplace to be important enough to warrant committed representation. The UK sales office is based in Abingdon, Oxon. Tel: (086730) 7331.

## BELFAST '89

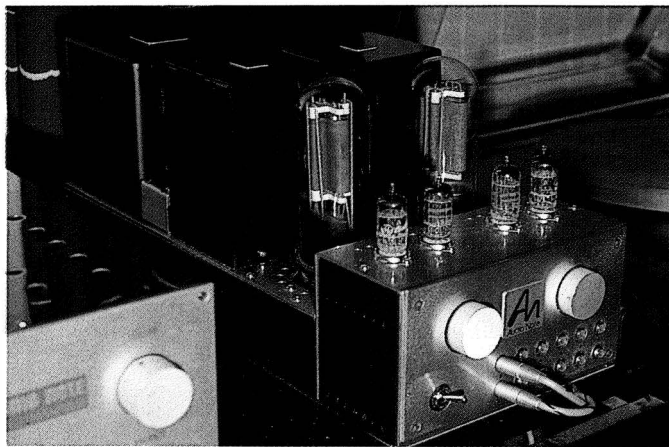
### AND THE SHOW GOES ON . . .

It hardly seems a year since I last hiked down to Heathrow and caught the shuttle to Belfast for the first annual Zeus show, but a year it is. And a year in which a good few of the new products that appeared at the last show have made it into the pages of *Choice* – the delectable Klyne preamps and Shan loudspeakers to name but two.

Given the major shows already to have taken place this year expectations weren't high about brave new product, but there were a few surprises in store. Lindley Audio, which made its first appearance at Penta, has not been resting on its laurels – complementing the extravagant *Principles* model is the *New Age* tubular floor standing design that offers adjustable HF attenuation and is said to combine the



Lindley New Age.



Top to bottom: 42kgs of serious Japanese amplifier; the Audio Note Ongaku. Spot the counterweight on the Audio Innovations tonearm and ooh, er – Pink Triangle's Little Pink Thing.

advantages of reflex and transmission line techniques. This cloth covered speaker will retail for under £800 and looks set to appear in the *Sessions* pages soon. Another domestically friendly speaker system was found in the Bose room where a new satellite and subwoofer system was shown featuring almost pocket sized satellite units. On the more affordable front Goodmans was giving its new *M100* bookshelf speakers, of sub-*Maxim* dimensions and an £80 price tag, an airing alongside the new *Magnum* series of big boxes. These are aimed at the American market but due to appear over here.

The record player scene still

appears pretty active. Alphason brought along its new budget deck, the *Marcyas* which first appeared at the 1988 Penta but nearly got shelved as the company had difficulties in producing a competitively priced tonearm. In the end Alphason relented to dealer demand and will be distributing the deck armless to retail for around the £170 mark. Pink Triangle's *Little Pink Thing* made its debut in two tasty finishes, nextel and black lacquer, and in engineering terms is a bit of a PTT *TOO*-meets-Roksan *Xerxes*; price is a competitive £345 without arm.

Possibly the most exciting and affordable new vinyl oriented product was Audio.Innovation's

tonearm. So far unchristened, it has the novelty of having dispensed with the traditional counterweight in favour of a spring! What's more it works, and the price looks set to hit the £150 mark. Elsewhere in the same room could be seen (but unfortunately not heard) some massive speakers made by the Japanese company Audio Note. These feature a massive mid bass driver of around 18 inches in diameter, complete with pigskin suspension and a central array of four silver-plated tweeters.

But for myself and many others, the highlight of the show was listening to the Audio Note *Ongaku* power amplifier, a 27watt single-ended triode design of the most astonishing sonic transparency. In part this ability is put down to the silver wound transformers – there's 4kg of silver in this beauty! Before you all rush out to buy one, however, I should perhaps mention the price which is a shade under £30,000 . . . and even if you can come up with that there's a five month waiting list! On a more realistic level, Audio Innovations had drawings of a new hybrid amp due for production next March. Dubbed the *Series 100* it will retail for a mere £299 and looks like a half width 400 – very chunky.

A bit closer to production is the *Shan Tower*, a grown-up *Shimna* with at least two mid bass drivers, (rumours abound that the isobarik principle is being investigated). This was being shown in pre-production wooden form. The product is destined to be made out of the same composite material used in the *Shimna* and price should be around £700. Back in the land of up and running equipment, Mission was making cinematic noises with its new *Cyrus Signature*, a gloss black pairing of a heavily tweaked *Cyrus 2* and *PSX* which is being sold as a combo for £899.

So, even without the copious amounts of Guinness, the show was a success in quality if not quantity, a factor emphasised by the enthusiastic local audiophiles who just couldn't keep away – JK.

## CORRECTION

The Musical Design Company has informed us that the Eminent Technology and Micromega ranges are not distributed by Music by Design as we suggested in *Choice Sessions*, in November. We also incorrectly associated Linx Products and van den Hul with Music by Design. They are handled by Linx Audio (UK) and Viper respectively.



Imagine a man, sitting on a large wooden stage, holding a fan and a small, plain towel.

He's narrating a story that you know back to front. Do you think you would stay to listen?

In all probability, you would. Because the best Rakugo artists make old stories come alive. They add new detail and new subtleties to the narrative you expected.

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And to keep the information in its purest form, it is transmitted through digital and optical outputs.

So don't be surprised to find an extra voice on a favourite piece of music. Or an unexpected instrument. Or a simple use of echo.

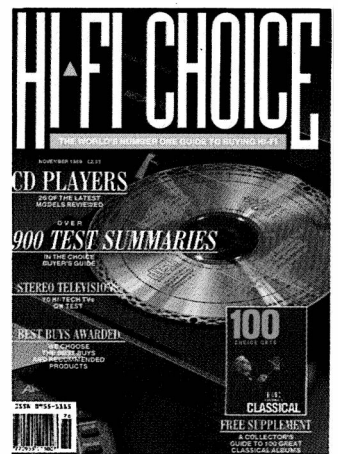
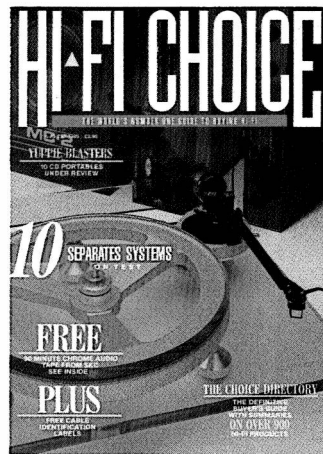
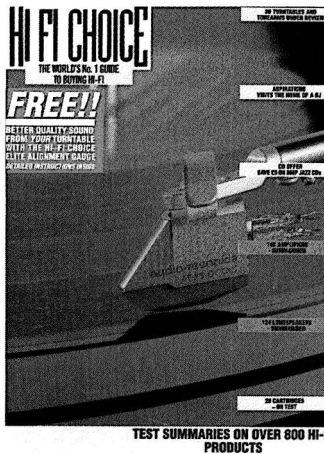
You may have heard the song many times before; the XC-005 will make you listen to it.



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# BACK ISSUES

All the issues you wish you'd never missed. Here's how to order back numbers and binders for your copies of Hi-Fi Choice.



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- Jan 88  CD BASED MIDI SYSTEMS (54)  
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Plus: Market survey on system building
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Plus: Headphones
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- Aug 88  ONE-NAME SYSTEMS (61)  
Also includes: CD players  
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- Sept 88  AMPLIFIERS (62)  
Also includes: In-car audio  
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- Oct 88  CASSETTE DECKS (63)  
Also includes: Valve amplifiers  
Plus: Headphones
- Nov 88  COMPACT DISC PLAYERS (64) (with free CD)  
Also includes: Digital amplifiers  
Plus: Loudspeaker cables
- Dec 88  CD MIDI SYSTEMS (65)  
Also includes: Floor standing loudspeakers  
Plus: Tuners
- March 89  AMPLIFIERS (68)  
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- Nov 89  CD PLAYERS (76) (with free Classical supplement)  
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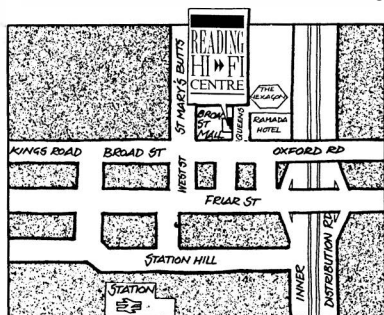
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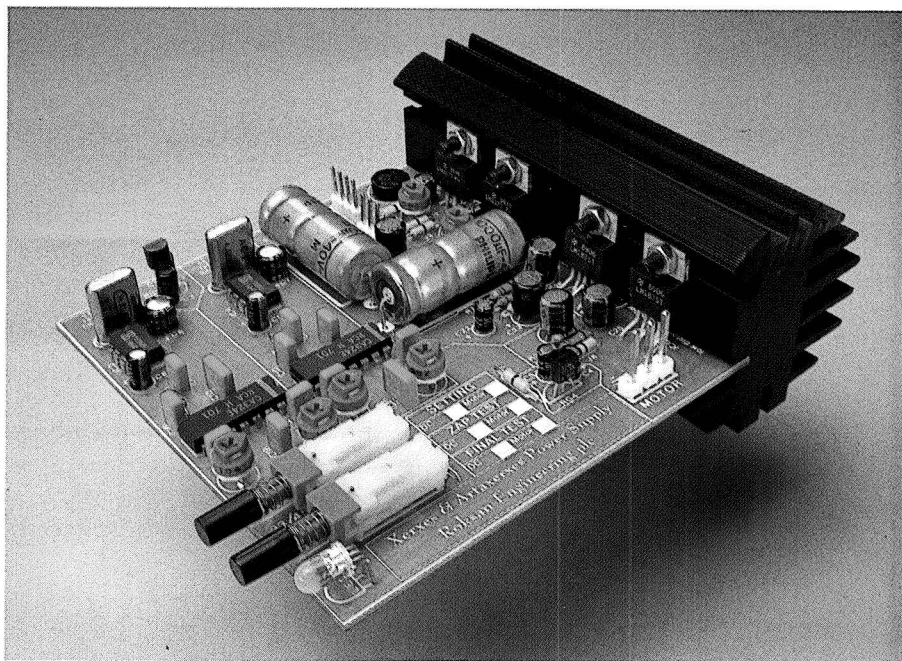
# HI-<sup>▲</sup>FI CHOICE

FEBRUARY ISSUE ON SALE JANUARY 12th



## CHOICE SESSIONS

*Things we hear . . . A new power supply from Roksan Engineering, Short Wave radio Grundig-style, and a modified Quad power amplifier from Avondale Audio.*



### RHAPSODY ON ROKSAN

*Alvin Gold savours the Roksan XPSII Xerxes and Artaxerxes Power Supply and finds a sweet-sounding upgrade.*

If you were ever in any doubt that something as simple as a turntable power supply can drastically affect the performance of the turntable to which it is attached, the XPSII provides conclusive proof that you were wrong – or that your ears are not set up correctly. Trot along to your dealer and find out which applies in your own case. The differences between the new and the original Roksan Xerxes power supplies are such that my wife, who usually has difficulty telling FM from AM, was consistently able to identify which of the two Xerxes power supplies I was using as well as recognising the key sonic features of each. She has no problems with Stork and butter, either.

These sonic features – aural fingerprints might be more appropriate in this case – are striking to say the least. That is to say, they're not readily subject to misinterpretation or ambiguity. In every case, and irrespective of the music chosen or the partnering equipment used, the XPSII made the Xerxes sound fuller and weightier in the bass as well as giving a larger, more precisely positioned and better separated soundstage.

From the very start, one of the most striking differences between the Xerxes and other top ranking turntables (the Linn Sondek LP12 especially) has been found in the way low frequencies are reproduced. To my mind the Xerxes gives superior definition, speed

and integration; but it also sounds leaner and drier. In other words it doesn't sound like a Linn. There was never any suggestion that depth of bass was lacking, but the quality often described as presence or weight was reduced. Anyone who has heard the Xerxes side by side with a Linn will have been struck by the extra weight and presence of the latter, the bouncy, rounded quality that is so recognisably a part of the package.

The XPSII changes the Roksan bass. It doesn't actually make it sound like a Linn, but it does make it sound warmer (arguably) and fuller (certainly) in the bass, and the extra weight and power in this region is palpable – I'm not talking about mere matters of detail. The opening out of stereo imagery is probably a consequence of this stronger low frequency foundation.

There are no important trade-offs to worry about. The exquisite detail, the ultra fine timing and high level of pitch integrity associated with this turntable are all undiminished, and in some cases perhaps even enhanced. In one example taken more or less at random, the excellent EMI recording of Rachmaninov's *Rhapsody on a Theme of Paganini* (Cristina Ortiz/NPO) acquired a new and luscious ripeness in the lower strings, bringing the recording just the extra presence and atmosphere that the description above implies. Using the track *Handle with Care* from the *Travelling Wilburys* album, the new supply improved bass definition and separation, an effect particularly obvious in the opening bars which are sharper and tidier, lending the piece extra vitality and focus. It's all good stuff.

*Roksan's XPSII power supply feeds not just the Xerxes, but also the forthcoming Artaxerxes phono amplifier.*

The only problem I encountered was one I recognise from my Linn Sondek days. There are loudspeakers around (including one I am not at liberty to name here) where the extra LF information turned out to be more than could be readily coped with, turning a benefit into something close to a liability. But this was scarcely the fault of the power supply, as I was able to prove time and time again using other equipment of known capabilities.

OK, let's move on with a few remarks, first about nomenclature. The Artaxerxes, which will be available in the Spring, is a phono amplifier that fits inside the plinth of the Xerxes and provides a fully equalised line output to feed a line level preamplifier, or perhaps a passive preamplifier. It will come in two versions, a state-of-the-art dedicated MC phono stage or a less extravagantly specified unit with switchable gain for MM and MC cartridges. The Artaxerxes will be powered by a tap from the XPSII turntable power supply, for which a second socket is fitted at the back. (This output is not available from the old supply.) XPSII of course simply means Xerxes Power Supply Mark II. There have been changes before, but they amounted to little more than variations on a theme. Apart from the outer wood veneered sleeve and metal box, the XPSII is completely new.

The XPSII basically does the same job as its predecessor, but it does so in a different way. In the new unit, the output of the transformer feeds a new three-stage rectifier, followed by two entirely separate dividers and filter circuits, one for 33rpm and one for 45rpm. In the old supply, the two quartz crystal oscillators were routed by the speed switch through the same divider network, which inevitably was compromised between the requirements of the two speeds.

The XPSII also employs a selection of high quality components in the filters, said to result in a very low distortion waveform and very steep filter slopes at the output. With both speeds, THD is quoted in the 0.05 per cent region, whereas with the old supply it could be anywhere between 0.8-2 per cent. The new design has also rendered DC offsets negligible, says Roksan, which makes for quieter motor running. Next, the phase relationship between the two phases of the supply are claimed to be held much closer to the required 90 degrees. The circuitry is also said to be short circuit proof. In the case of gross abuse or overheating, it will shut down and come back to life when the danger has passed. The other important point that everyone will notice and welcome is that the MkII supply is much cooler running, due to a change in operating mode from Class A to Class AB.

Internally it's also much better made. The circuit is built around an almost identically specified toroidal transformer of considerable size, but the new pcb is a third smaller than the old one despite having approximately twice the number of components, a feat achieved by increasing component packing density, and by making the board a two sided affair, with a large number of surface mount components on the track side. The smaller board area means that the circuit can be kept well away from the transformer, and in any case it is now screened by the heat sink. *XPSII* has roughly the same output voltage as the old supply on 33, but is higher on 45rpm (within 1 volt of the 33 figure), giving a much faster run-up to speed.

The main external differences lie in the switching. On the old design, the on/off switch was on the back and the speed change lever on the front, an arrangement intended to encourage leaving the motor running between records to lengthen belt life. This arrangement was a consistent source of complaint, and has been changed. The on/off switch is still on the back, but it now acts simply as a mains isolation switch; on/standby switching is available on a front panel press button alongside the speed change switch. A three-colour LED keeps track of the current status, if you can remember the colour code.

And now the bad news. If you're interested in the new supply, and I can't imagine any Roksan owner *not* salivating at this point, it will cost no less than £149 (ouch!) to upgrade. Admittedly this price includes the labour involved in gutting the old supply, drilling holes for the new controls and fitting the new gubbins. New front panel stickers are included in the price.

Of course, value for money considerations don't really apply here. By my assessment, the audible differences are more than worth the price, and if you confirm what I say for yourself (nobody should consider changing their system without listening first) you're in a captive market situation. You might just as well grin and bear it. But as I said earlier – ouch!

## GO AHEAD LONDON . . .

*Alvin Gold rediscovers the delights of Short Wave with a Grundig wireless.*

Am I alone in seeing an irony in the way digital tuner technology has developed? Digital techniques now dominate the hi-fi tuner arena, but have done little if anything to improve the state of the art. Yet digital front-ends are only now beginning to have any impact where they ought by rights to have made the greatest contribution all along – in portable equipment. I've chosen a purist analogue FM-only tuner for my own hi-fi system in preference to a digital one because analogue remains the technology that best meets my musical requirements, but I don't think I'll ever again contemplate buying a portable analogue radio.

I now own, and use regularly, an Aiwa that's the size of a thick credit card, equipped with AM and FM presets, a stereo decoder and a sleep switch (one of the most effective battery savers yet devised) for night time listening when the lights are out. My wife uses a little Sony with presets and, again, a sleep switch around the house; she has never had the patience to learn about complicated things like wavebands and frequencies, and the Sony fits the bill admirably, as well as sounding good.

Both these models are what might be called second generation digital portables. First generation units were more or less ordinary radios with the rotary tuning mechanism lifted out and replaced by a primitive digital tuning circuit, often quite poor in performance. From my experience, they tended to be noisy, whistle prone and extremely battery hungry. The second generation of portables have answered these shortcomings, and added clock, timer and sleep facilities, and in the best examples protection for the memory contents when the batteries expire.

So now on to another second generation digitally tuned radio. I first saw the £300 Grundig *Satellit 500* at a press conference in Germany, and promptly requested one for review. In this country, Grundig is chiefly

associated by the public at large with the 'Boy' table top radio range – *Yacht Boy*, *Ball Boy*, *Wide Boy* (are you serious?), *Charlie Boy* and the androgynously named *Girlie Boy* (I think I've got the names right). Amongst Short Wave freaks however, Grundig is synonymous with the *Satellit* range of SW receivers. 1989 was the 25th year of *Satellit* production (a quarter of a century and Grundig *still* can't spell it right . . .), and the 60th year of public Short Wave broadcasting. The *Satellit 500* celebrates both events, says Grundig, but I prefer to see it as a coming of age of digital techniques in the service of portables, and as one definition of a truly modern, all-purpose table top radio. The *Satellit* is more than just a Short Wave receiver.

The Grundig is a true clean sheet design, with a veritable wish list of facilities, including an external aerial socket for FM, not just SW. The set has a memory capable of storing 42 presets frequencies, each of which can be user-programmed with a four digit alpha numeric station label ('RAD3' for example). Any mix of frequencies on different wavebands can be programmed in any order.

The *Satellit* is designed to cover Short Wave frequencies in 20 bands stretching from 10-90 meters, plus Long and Medium waves and VHF/FM, the latter in mono or stereo, though to hear the output in stereo you'll need either an outboard speaker (for the left hand channel) or a pair of headphones. Along the left and right edges are rotary controls for tuning, volume, bass, treble, balance and manual or auto gain control, the last to cope with atmospheric fading problems on Short Wave. One rotary acts as a 'lock' switch to protect control settings. The large central control panel handles everything else, including manual input of frequency or band data, time, station name programming, preset or frequency scanning, random preset access and more. It also includes a real time clock and two independent timers (on and off times being separately programmable) and a sleep timer. The unit accepts either battery or mains power and has lithium battery back-up of all memorised data apart from the clock setting. Well you can't have everything . . .

Manual tuning involves selecting the waveband and spinning the tuning control, or directly entering the frequency. In the latter case it's not usually necessary to enter the waveband which is inferred from the number range. Thus entering 92.9 selects FM, 648 switches the set to MW and so forth. Entering 19 automatically calls up the 19 metre band on SW at the starting frequency 152750kHz. Tuning steps are extremely narrow – 25kHz in the case of FM for example. On AM, a very fine tuning facility (Sync) allows the tuner to be tuned in 100Hz increments (eg 648.1kHz, 647.9kHz and so on when starting at 648kHz) to help differentially tune out interference. The setting arrived at is stored in memory with the other preset data.

Other reception aids include variable AM bandwidth which trades audio bandwidth (in effect, sound quality), against interference. This facility is highly effective, leading to phenomenal differences in clarity, tonal quality and perceived distortion, but the better, wider bandwidth can lead to reception problems in adverse reception conditions. The bandwidth setting is also stored auto-



Grundig Satellit 500: the latest generation in digital table top radios.



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matically with the preset frequency information, but can be changed freely.

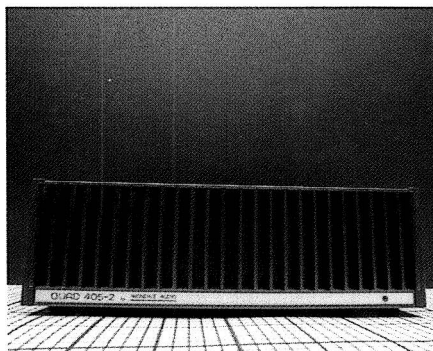
For Short Wave use, the Grundig includes facilities to receive single sideband (SSB) transmissions, which will become more important in future because of their reduced broadcast bandwidth requirements.

A tremendous amount of solid thinking has gone into this radio. Take for example the inclusion of built-in variable rate charging circuits (which can be switched off) in case you want to use NICADs instead of disposable batteries. The variable charging rate allows indefinite mains connection without risk of over charging. The LCD display is perhaps a more obvious high point. It gives a clear simultaneous read-out of time, timer status, tuned frequency and station name, plus preset number, signal strength and battery condition. The display, along with the main numeric keypad used for tuning and recalling presets, is permanently lit when mains powered, and can be temporarily lit otherwise. To round things off, the *Satellit 500* is well endowed with socketry, though I would have liked to see entirely independent AM and FM aerial input sockets.

The Grundig isn't the easiest portable to use. You really need to apply yourself to master all the features, and even then the control arrangement isn't particularly transparent or intuitive. Preset numbers for example have to be confirmed using a key labelled 'frequency/m.band' before anything happens. There are more basic failings too, like a fold down handle that's difficult to raise when lowered, and a volume control that is hard to tell apart from the other rotary controls. I object to the residual touches of German, for example the sign 'HA' to indicate manual tuning (ha!) and the use of a rather obscure press switch as the main on/off switch. These however, are minor things, and do little to detract from this desirable package.

I accept that a certain interest in long distance reception is presupposed in this design, and I'm not qualified to give a final analysis of Short Wave performance. Having said this, my inexpert judgement is that it's extremely fine, and compares well with any other SW receiver I've used, though I've not used any really high grade SW receivers for a long time. The generous availability of presets and the ability to name stations makes the radio all the more practical in this context, and this is perhaps the only ambitious Short Wave set which can be recommended for those who want to avoid all complications once the initial programming has been completed.

I had a great deal of harmless fun listening to stations from the Middle and Far East, America, Africa and elsewhere, often with truly excellent sound quality. AM sound quality was extremely good within the inherent constraints set by broadcast bandwidths and so on, and the same applies with FM where the Grundig was able to speak with a positive and open voice. I didn't use the radio much for music, but it is nevertheless creditable even here and of genuine high fidelity standards when used with headphones. Speech sound quality was almost ideal, the bass being tighter and the midband a great deal more articulate and easy on the ear than usual, probably because in addition to all the clever technology, the set is also physically well put together.



*New IC, new wiring, new power supply, new everything... Avondale Audio's rebuilt Quad 405.*

## BREATHED ON BEAUTIES

*'Turbo charging' your old amplifier can bring new life to a hi-fi system. John Bamford reports on Avondale Audio's design and modification service.*

Way back in February last year we reported on an ageing Musical Fidelity *The Preamp* which I'd had revitalised by Avondale Audio of Chesterfield. Avondale's proprietor is Les Wolstenholme, an electronics designer who has been in the business of rebuilding and upgrading components for over six years.

The 'tweaking' of amplifiers is largely frowned upon in the UK hi-fi industry, for reasons which I would argue are largely illogical. "Mess around with the insides of our Hokey Cokey 5000 amplifier and all guarantees are invalidated," is the response of most manufacturers. Well it's obvious that the guarantees are invalidated! What would any reasonable person expect? Just as anyone who decides to tweak their motor car by uprating the carburettor(s) or bolting on a turbocharger does so at their own peril (is the car's suspension and braking system up to handling the extra performance? Will the engine be prematurely burned out?), so it is with hi-fi equipment. If you do decide to 'doctor' the insides of your amplifier, don't expect any sympathy from the original manufacturer if the amplifier breaks down a few thousand miles down the road!

Consequently, you'd be foolish to entrust a valuable hi-fi amplifier for 'turbo-charging' to any old Tom, Dick or Harry who claims to be an 'electronics expert'. But your amplifier is safe in the hands of Avondale Audio which, as I said, has been in the modification business for over six years and has literally hundreds of satisfied customers to vouch for its accomplished handiwork and honest dealings. Particularly popular components for modifying appear to be old Musical Fidelity, Meridian and PS Audio pre- and power amps, Naim's classic *'110* power amplifier (a friend

of mine uses one of these), and – of course – Quad amplifiers.

Recently I've been listening to an 'Avondale Quad 405', heavily modified to the tune of £224. If this seems expensive, well, assuming you're using an old Quad (long out of guarantee, etc . . .) how much is it likely to cost to upgrade to something substantially better? Considerably more than £224, surely.

If I may quote heavily from Avondale's literature on the 405 'modification programme', the original concept of Quad's current damping and feed forward error correction is capable of excellent 'technical' performance, but sound quality of the 405 has been compromised by employment of ordinary commercial grade components, wiring which is restricted in its current carrying capacity, and a system whereby the output current is deliberately limited to protect the output transistors from damage. Avondale subjects the amplifier to 'major surgery', dismantling the 405 piece by piece. All components are inspected, the heatsinks are cleaned and re-seated using fresh heat transfer compound, while the two main reservoir capacitors are replaced by 'computer grade' units which each have a continuous discharge capability of over 15 amps. The integrated circuits (chips) at the input of the amplifier are replaced with better specified types and these are given a very high quality regulated power supply mounted within the case. The main wiring loom is renewed with thicker grade cables to carry the extra current, signal paths are rewired in silver plated wire for better signal resolution, new (more robust) output sockets are fitted and you can specify gold plated phono input sockets at no extra charge. Finally, our photograph of the rear panel shows that where the redundant voltage selector used to be, there's now an XLR socket which accepts the input from Avondale Audio's auxiliary power supply unit. This is an optional extra for those audiophiles who really want to go to town, and it costs £248.

Even without the beefy outboard power supply (which I've not heard), I can report that this modified Quad is a real eyebrow raiser. Avondale claims that its rebuilt 405 can cope with difficult loudspeaker loads with ease; for my part I can say that it sounds powerful and dynamic, with excellent solidity in the bass – real 'slam' – and good focus and imaging. The improvements over the original amplifier are far from subtle, and I reckon this is a fabulous upgrade when you consider that to make substantial improvements to the subjective sound quality of any hi-fi system is usually a very expensive business.

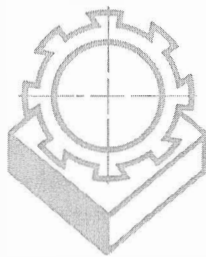
Avondale Audio can be contacted at The Hollies, Avondale Road, Chesterfield, Derbyshire S40 4TF. Tel: (0246) 200096. We have also received advance information at *Choice* of an 'Audio Designers Open Day' which is being held on Sunday 25th March (10am–6pm) at the Chesterfield Hotel, Malkin Street, Chesterfield. Exhibitors will include Avondale Audio (of course), who will be demonstrating all sorts of interesting components, along with Concordant Audio, Lynwood Electronics, Audiokits, Nottingham Analogue Studio and Grant Amplifiers. Admission is free, and doubtless it should be a fascinating day out for the layman and DIY electronics tweeker alike.

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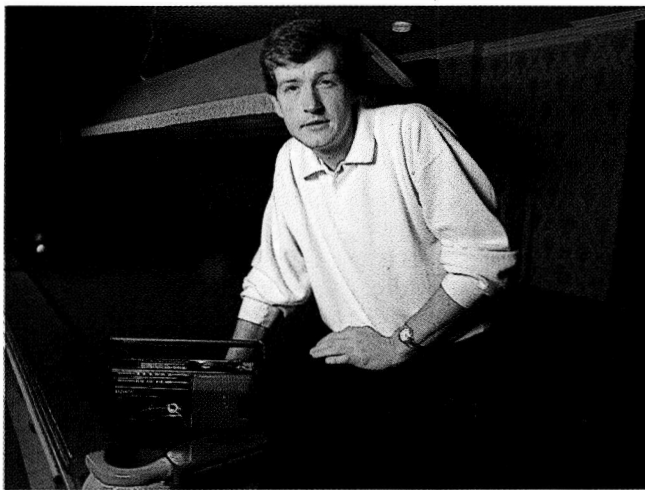
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## ASPIRATIONS

*"I'm not a hi-fi freak, but I am becoming a plastic freak," says Steve Davis. Nevertheless the snooker champion owns a system line-up that many would aspire to, writes Dan Houston. Photographs: Chris Richardson.*

# Cued Up On Vinyl



The first encounter with this month's host Steve Davis, was a brace of Rottweilers – well known for their transient response qualities – which came bounding across his lawn barking a 'welcome' as we drove up to the iron front gates of his Essex farmhouse. Directed around to the back we found the snooker ace dressed as if he was about to go out jogging, in polo shirt, tracksuit-bottoms and Reeboks.

The large turreted redbrick house stands alone with a commanding view across fields and the built-up townscape of the Thames valley estuary. It was built in the eighteenth century (Steve thinks) and reflects the aspirations of the landlords' successful husbandry of the surrounding soil – it's very much a working farm and

while the front lawns are smartly groomed, the back farmyard is like any other. Steve lives here with his parents when he's not doing something like introducing snooker to the Chinese.

Steve Davis is into soul music, in a very big way. And apart from the rigorous practice schedule to keep him at the top of world snooker (where he's been for the last ten years) it is his 'only indulgence'. He's been a serious collector of soul releases, particularly on vinyl from esoteric American labels, for the last four years, and points out – in case anyone was wondering – that it's better than collecting stamps or coins. He buys by the 'job lot' from dealers or other collectors and considers that he's just about getting to the

*Steve Davis says he's as equally at home with a mono portable Sony radio cassette player as with the equipment in his listening room (right).*





stage where he knows what's what.

Contrary to the dullness of his Spitting Image character – sarcastically dubbed Steve 'Interesting' Davis – he has a restrained but palpable burning energy. Typically of his profession he appears to be thinking of about five things at once while maintaining a sort of 'elsewhere' aura. Staccato sentences put a strain on the shorthand and he admits he rarely sits down in one place for very long.

At first we were shown into one of the farm outbuildings, which is used to house some of his record collection. Covering the floor were stacks of singles and albums in cardboard boxes, all apparently in alphabetical order. Some will be resold to other collectors, and there are unopened boxes

of the same single confirming his wholesale approach to deleted vinyl. "I'm keeping all these," he said, gesturing to about a third of the room space.

Cataloguing the collection is a constant task. "A record collector never has time to listen to all of his collection but at least he's got it to listen to one day," he elucidated, "a lot of these records aren't going to be around in a few years' time."

It's obvious that collecting soul music has become as much a passion as the sport that gives him the wherewithal to pursue it. Capitalising on his nickname he produces a weekly radio programme called the Interesting Soul Hour, for Richard Branson's Radio Radio satellite service, which gets syndicated to local indepen-

dent radio stations. "It's great, I do all interesting things and it's really revolutionary!" he says, tongue in cheek. He also owns a soul magazine – *Voices from the Shadows* – which is part of an apparently money-losing concern called Interesting Promotions. "The magazine's only read by a few people and it was going under," he says, "I was in a situation to finance it and I wanted to read it, so I pay for it."

The quarterly magazine also reports on gospel music which is another area of 'interest' alongside soul. So, is he religious? Declining to answer specifically he talks about the vocal quality of gospel singing per se. "I find I am getting more value from the great singers regardless of what they're singing about. A lot of gospel is

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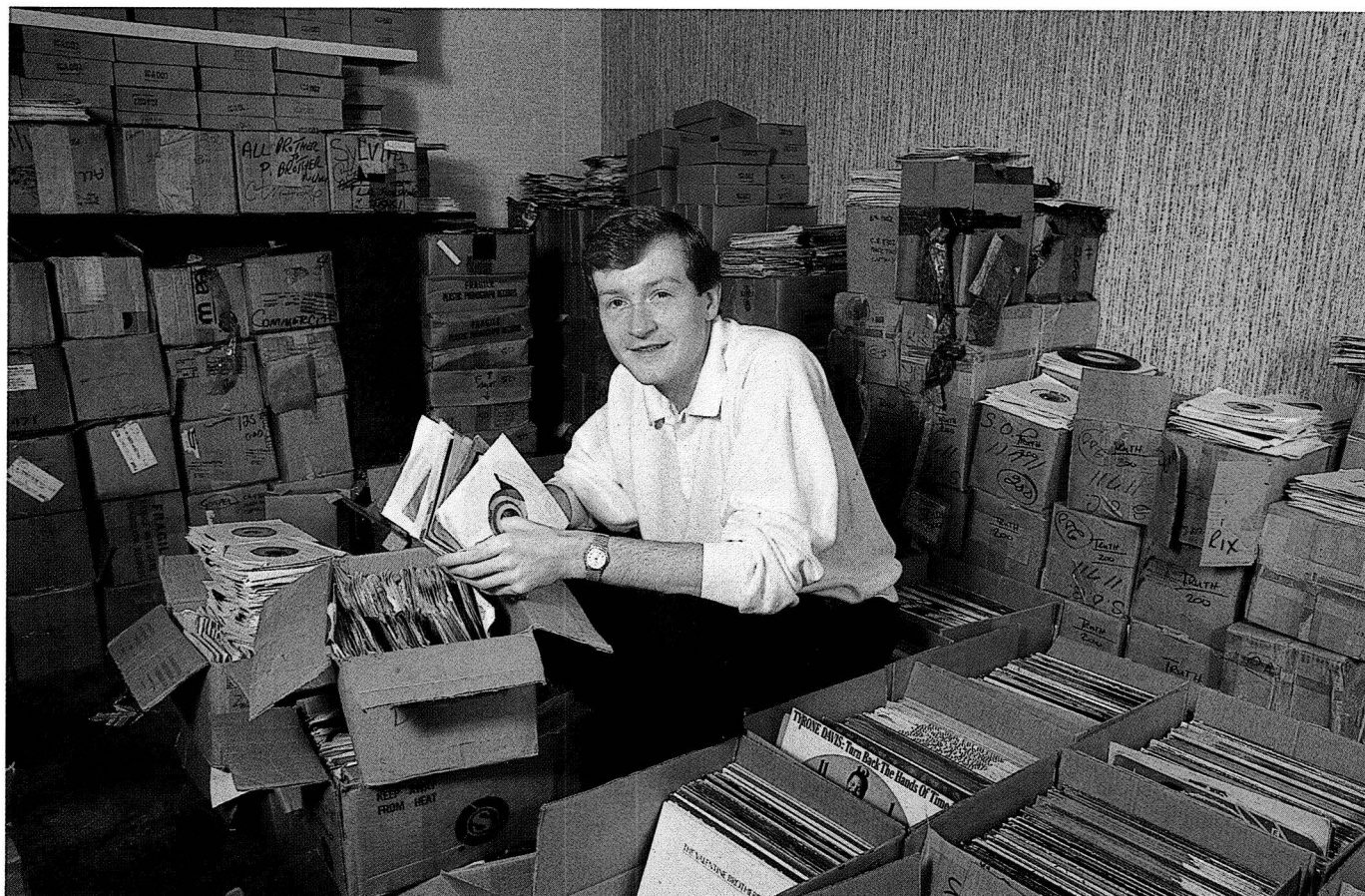
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untapped by soul fans because they are put off by the praising and stuff. But there's a lot more of the 'I love you' than 'I love God' in modern gospel. I don't care what they're singing about, I just love the commitment."

His comparatively recent initiation has led to a spate of 'furious back-buying', while travelling and by mail order. "The biggest dealer is in Canada, but the biggest buying markets are in England and Japan; collectable labels are Curtain and Buddha at the moment, with Philadelphia – stuff like the O' Jays – coming up on the outside. Or you can go to Hong Kong," he remarks casually as if my pockets are just stuffed with air tickets, "that's a great market . . . but don't go for a while cos I've cleaned them out!"

Following *Choice's* recent noting that America has gone digital, the revelation that the States is not the best market for one of its better cultural products doesn't come as such a surprise. But it's a shame. American collectors of soul would probably find better pickings in the pages of *Voices from the Shadows* than they would from a tour around the music shops of the Deep South.

While esoteric soul records have become his main listening material Steve

claims he was always into offbeat rather than mainstream music; his infatuation with a 12-piece French band called Magma is well known.

"In the early days at school I never liked to listen to what was popular. When I was 16 or 17 everyone was listening to Roxy Music and David Bowie, and I was listening to things like the Canterbury jazz-rock scene. A mate and I went to the concerts in our aghans – I'm as conventional as they come though I was accused of being a hippy once – and we went to see Isotope, a band we knew, supporting this band called Magma. We thought it was crap at first and

*If Alladin was a soul boy his care would look something like this.*

we were just leaving when what they were trying to do suddenly hit us."

Just what Magma was trying to do proves difficult to explain: "It's a mixture of classical, jazz, rock and opera. It's a mish mash to some people but to others it's very entertaining. Anyway, somewhere down the line I thought it would be nice to see them in concert again. So in '87 I phoned up and got them over from France



*The equipment line-up. But Technics decks are preferred for the large numbers of singles in Steve's collection.*



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512.2



510.2



507.2



505.2



504.2

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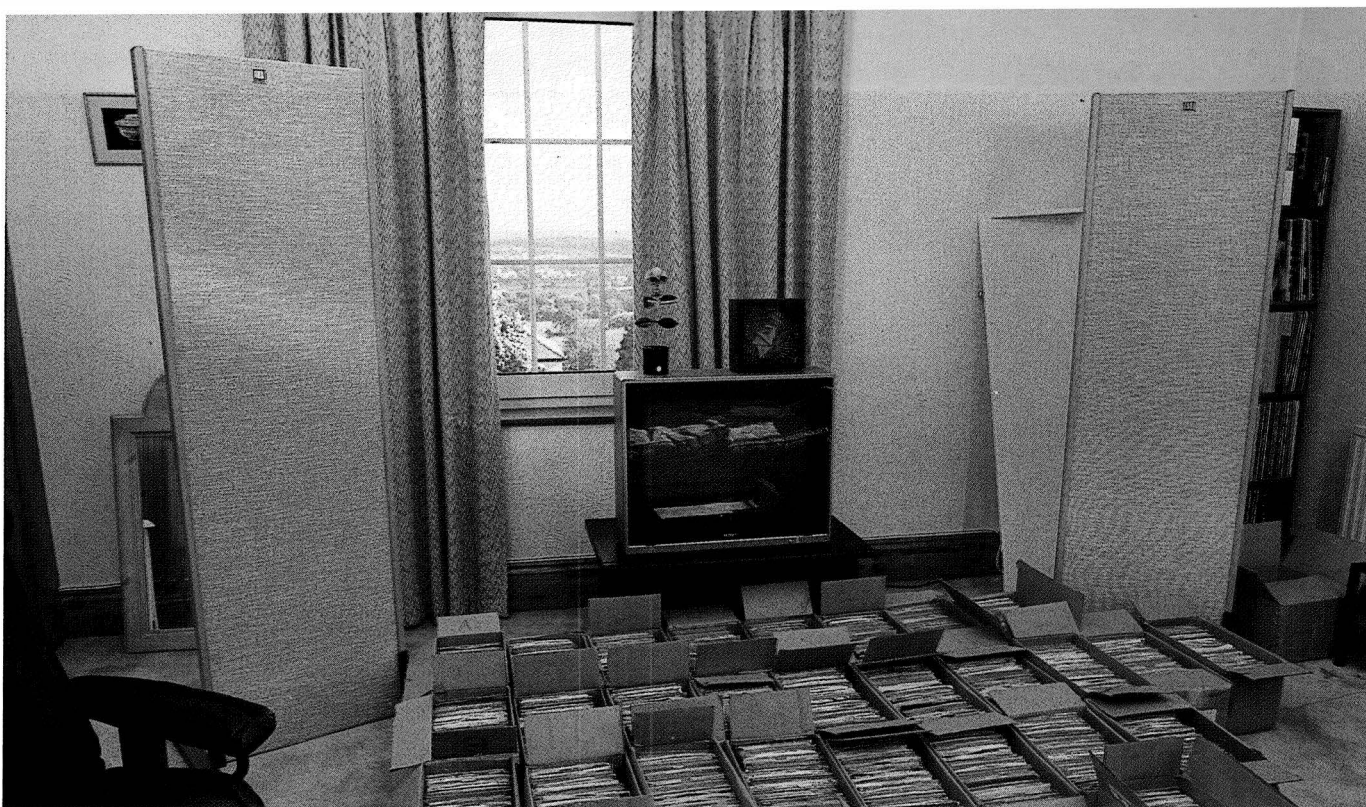
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to play the Bloomsbury Theatre in London. All the old fans came along – the first bloke I saw was wearing an afghan or a coat of many colours but the next had on a bowler hat and three-piece suit!”

Steve has all of Magma’s records but could only be persuaded to play their most commercial offering. ‘Off the wall’ probably sums up the sound.

Hi-fi can be found in the form of a B&O system in his bedroom and some more esoteric gear in the second floor listening room – a sort of sanctuary at the top of the house. There are more records in purpose-made shelves, more boxes of singles on the floor, a disco desk for mixing singles on to tape and the main hi-fi in two equipment stacks. Then there are the huge Magneplanars. “I’ve got three speakers,” he says, “these two and the floor!” While the sprung floor is good for foot-tapping reverberation it also makes the stylus on the Linn *Sondek* jump on the record every time he walks past (scope for a Townshend International or similar isolation platform here). A Sony Trinitron supports an impossible-to-read triangular-handed clock, and a decibel-activated dancing flower – “he likes the music”.

The original system was based around the two Technics turntables, a Revox mixer and Revox *PR99* tape recorder. “At one stage I thought I wanted to mix records on to tape, so I went out and got the gear, man! I had a few lessons from Les Adams, who was a DJ at the time and now sings with LA Mix; you need someone just to show you . . . but I got bored with that and on Les’s advice went down to Unilet. I’d heard the Linn was a good deck but beyond that I went on Unilet’s advice. I’d recommend anybody to go to a specialist hi-fi dealer if they have any money to spend, you can’t beat it and setting it up yourself is a nightmare.” The original sys-

tem was partially upgraded by Unilet and wired into the new set-up. A QED switching unit runs both ‘front-ends’ into the Krell power amp.

But the purest sound on record is via the *Sondek* fitted with *Ittok LVII* arm and *Karma* cartridge, Krell *Pam 5* preamplifier and Krell *MkII ‘A’* stereo power amplifier, and the Magneplanar *MGII*s. Alternative high-end sources are available with a Marantz *CD94* CD player, Nakamichi *ZX7* cassette deck or Revox *B261* FM tuner (which has preset buttons large enough for Steve to have written his favourite station names – Capital, Radio Essex etc – on them). There’s also a Teac (*W880RX*) twin cassette deck completing the comprehensive set of options for musical reproduction. Interconnect is from Monster Cable and the Magneplanars use Absolute Wire *Force 4* loudspeaker cable.

There are very few compact discs in the collection – certainly when compared to the great wall of vinyl – however, rather than denigrate the sound of CD (which many consider inferior to a good analogue system) Steve finds the sleeve artwork and fragility of records far more ‘collectable’. Some CD soul releases were bought because they contain extra tracks – and he can play them on a Pioneer player in the downstairs snooker room.

As might be expected the listening session turned into an introduction to rare and favourite soul music, with Steve playing DJ, flipping 45s on to the Technics decks or squatting among the boxes, apparently knowing which record to choose next. He seems to prefer standing and using the Technics rather than indulging himself with an album on the Linn.

“Occasionally I come up here, put on a good record, sit down and lose all track of time which is good, but having a chair in the middle of the room is a bit like making



The room with a view (above) fills up with the sound hidden in the acres of black vinyl, ably retrieved by the Linn *Sondek*.

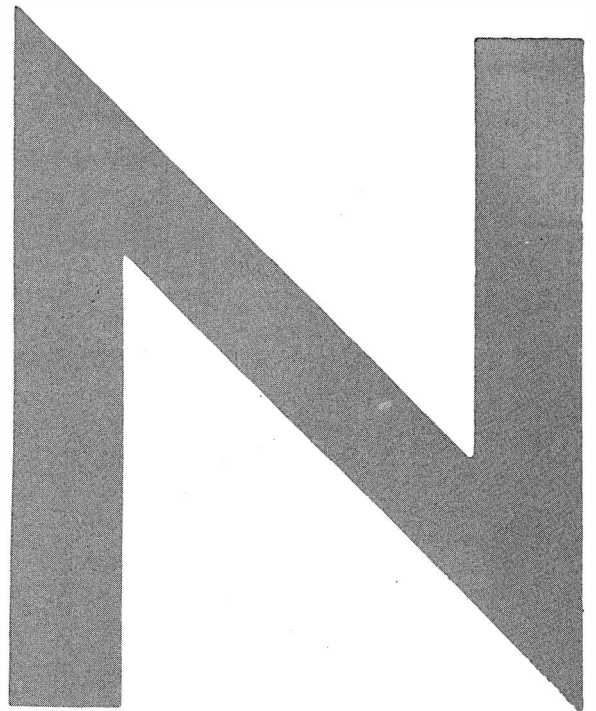
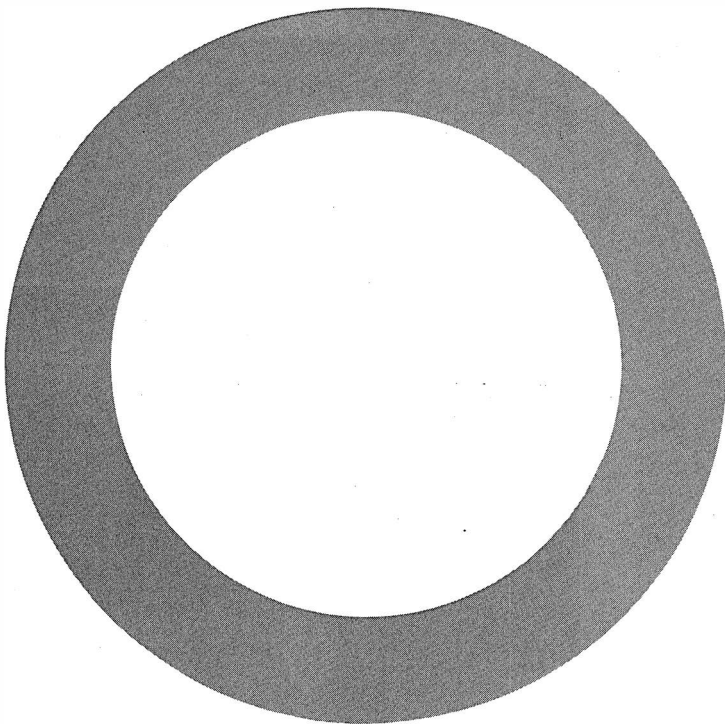
it hard work. My favourite time for listening is at two or three in the morning.” We were listening to a Solomon Burke live album *Soul Alive* (Demon 1981). “How many remember their first kiss?” booms the self-ordained singing Bishop . . . “Yeah,” Steve joins in with the ecstatic crowd interrupting the conversation.

He further dashes the image of an audiophile, picking up and gushing about a portable Sony mono radio cassette player from America which he takes travelling, mixing tapes on to the Nakamichi!

He’s totally blasé about the merits of the Sony, insisting that it’s perfect for his needs: “I changed from stereo to mono because it’s more of a contrast to the Krell – that’s like using a pile driver to crack a Pistacchio nut. I get as much pleasure from the Sony as the other equipment.”

While the capabilities of the Sony are . . . uh . . . obvious, the rest of the system has been chosen with the best of sound reproduction in mind. And even if he is able to enjoy it for only a limited amount of time, Steve Davis can cue up a record knowing that he is doing something better than stamp or coin collecting.





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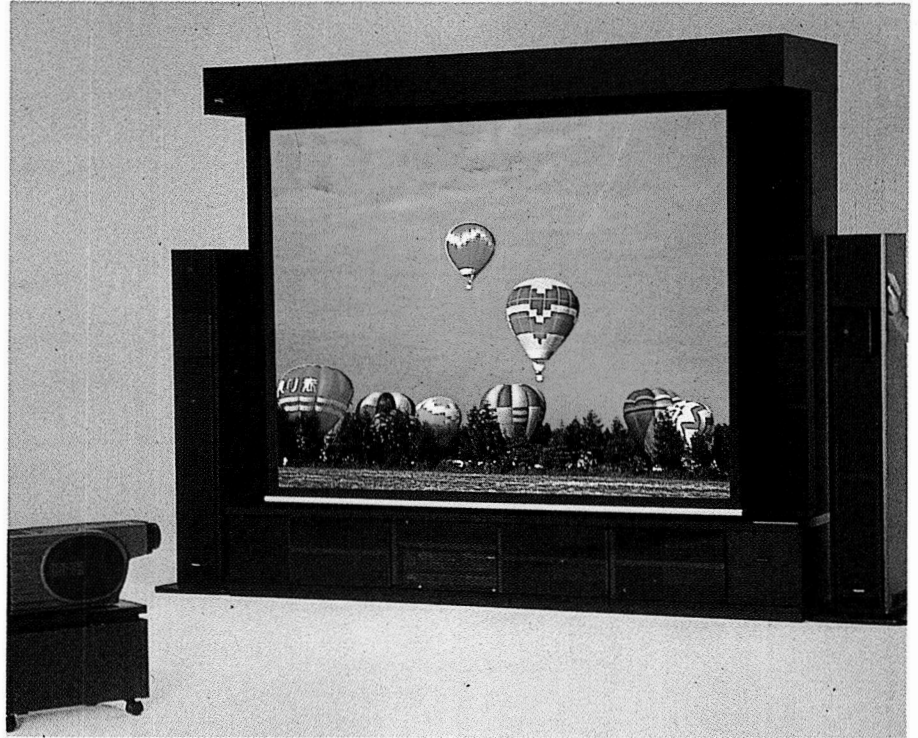
## PERSPECTIVES

*Memory chips and digital techniques are changing the quality of television pictures with or without HDTV. Paul Messenger reports.*

Even though the reality of broadcast programming is some years away, shrouded in the mists of international politicking, high or higher definition television (HDTV) is a new buzz phrase which is increasingly cropping up in the mass media. To add further to confusion at this stage of things, other acronyms such as 'improved' IDTV, 'extended' or 'enhanced' EDTV and 'advanced' ADTV are also bandied about, but in fact these imply a hierarchy of televisual improvements which will be introduced step by step over the next decade, while still retaining some elements of compatibility with existing technology and hardware.

Anyone who's seen the demonstrations knows that 'full' HD does offer dramatically improved picture quality. Whereas the introduction of colour 20 years before had turned the grass 'neath horses' hooves a deliciously welcome shade of green, High Definition adds the extra dimension of letting you see individual blades waving in the wind.

Apart from simply enhancing wildlife



# Towards Higher Picture Quality

programmes, improvements in definition are a necessary precondition for television to graduate from the current 'box in the corner' to a larger-screen, closer-viewed centrepiece of audio visual home entertainment. It may be debatable whether such evolution is desirable, given the power already exerted by the medium – or indeed likely, given the reluctance of households to adapt lifestyles to technology rather than vice versa. But no-one has yet succeeded in reversing the technological tide, so an eventual transition to HDTV is probably as inevitable as 405-line monochrome being steadily usurped by 625-line PAL colour over the past 20 years.

Improved picture resolution is only a part of the story. The crucial marketing stimulus for HDTV – and indeed the only completely certain and internationally

agreed factor – is a change in screen shape, to a 'widescreen' 16 x 9 aspect ratio which encourages closer viewing and greater involvement, against the 4 x 3 of conventional television. Received wisdom has it that 16 x 9 suits a 3-4xH (screen height) viewing distances, which in turn gives a far more cinematic experience than the 6xH viewing distance which seems most comfortable with 4 x 3 sets.

Recent BBC research questions how much closer people will really want to sit, but acknowledges that there will be a shift towards closer viewing. However, getting closer to the screen makes the current imperfections of CTV line structure and scanning techniques that much more obvious, so the move towards both larger and 16 x 9 screen CTV will require concomitant improvements in resolution and

the reduction of existing 'distortions'.

Still very much in the melting pot is the factor of how such improved signals can be transmitted to the customer, not to mention whether and how much we'll be prepared to pay for the privilege of receiving them. The improvement needed for HDTV requires at least twice the resolution vertically (about 1,200 lines) and an even greater increase in the horizontal plane (to take account of the extra width). All things being equal therefore, one HDTV channel would take up the same spectrum capacity as five normal channels. Of course such capacity is not available within the current scheme of terrestrial broadcasting, though cable networks, MVDS (microwave video distribution system) or satellites provide three possible technical alternatives, none of which is yet established. Which is one



reason why the route to full HDTV broadcasting could well take most of the next decade.

The first initiative came from Japan, primarily via national broadcaster NHK and Pro hardware manufacturer Sony Broadcast. This basically wideband (c27MHz) video system, known collectively as HDVS, is already in limited use by professional programme makers. It's particularly useful for commercials production, since video/electronic post-production techniques can be applied to an image of comparable quality to film.

A bandwidth compression system known as MUSE (multiple sub-Nyquist sampling encoding) has also been developed alongside HDVS, so as to allow DBS (direct broadcast satellite) transmission of a Hi-Vision signal to special 1125-line 60Hz receivers (no existing hardware is able to handle the signals). NHK has been satellite transmitting Hi-Vision for some time (but only for about an hour a day), to preproduction receivers on public sites dotted around the country.

Meanwhile European broadcasters and manufacturers, operating collectively under an EEC Eureka initiative, have an alternative 1250-line 50Hz HDTV strategy, based on the MAC (multiplexed analogue components) family of satellite transmission standards. D2-MAC is already beaming down signals superior to terrestrial PAL transmissions to several parts of Europe, and the BSB satellite is expected to start D-MAC transmissions to the UK early in 1990.

Such signals do need some sort of receiving dish and appropriate MAC decoder unit, but can be displayed on existing (or improved) sets equipped with SCART or Y/C (component) socketry. The MAC 'ladder' provides for eventual transmission of full HD-MAC signals that will remain (theoretically) compatible with the basic MAC decoder. In the year 2000 the consumer would then have a choice of using an existing (MAC-adapted) 4 x 3 625-line CTV, or spending (considerably) more on large screen, widescreen, double speed/progressive scan and all the other trimmings.

More recently (belatedly realising that they had lost out on a vast world market for VCRs), the US electronics companies have got themselves together to find yet another HD format, and seek government assistance in its development (citing the 'strategic importance' of display technology in the 21st century).

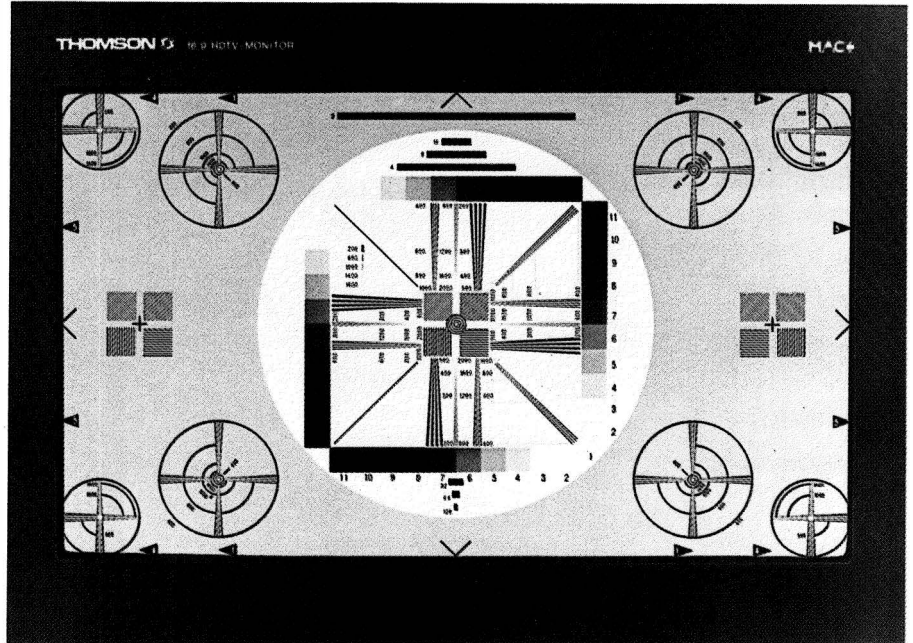
Given the amount of work that has already gone on in Japan and Europe, it seems increasingly unlikely that a single world standard for HDTV will emerge. Such weighty matters might be finally thrashed out during the CCIR's (International Radio Consultative Committee) May 1991 Plenary Assembly, but the need for common transmission/receiver standards is less than it was five years ago, now

that TV chassis are starting to think for themselves and operate independently of local mains frequencies.

It would seem somewhat premature to attempt to predict the launch and growth of the HDTV receiver market at this stage in the proceedings, but electronics business specialists BIS Mackintosh had a cautious stab at it in Autumn 1988. Note that the projections only relate to full HDTV/widescreen receivers, not the intermedi-

ation viewing over the next five years - IDTV, EDTV, ADTV and so on.

To attempt to cover all these possible steps would overtax author and reader alike with a whole variety of proposals, many of which may never see the light of day. But an important distinction should be made between improvements made at the receiver/CTV end of things - in signal processing and display presentation techniques - and in enhancements made at the



Test card for High Definition Television with 16 x 9 aspect ratio - the shape of things to come.

ate stages which are likely to provide the stepping stones. These show Japan starting up in 1990, but taking until 1998 to achieve one million annual unit sales, peaking at five million units in 2005. The US and European start-ups are 1996 and 1997 respectively, each reaching one million units in the year 2000 and continuing to grow steadily through to 2010 and beyond. Relate that to a current UK annual offtake of four million (two million large screen) CTV sets a year, and it's obviously much too soon to get excited about 'full' HDTV just yet awhile.

## STEPPING STONES

Whatever the final outcome for 'full' high definition TV in the mid to late '90s, the current level of debate has already started to bear fruit, if not quite of the variety the original HDTV proponents might have envisaged.

The vital European contribution has been in structuring a 'hierarchy' of step-by-step improvements under the MAC umbrella. Squeezing the essence of a 27MHz HDVS signal into a 5MHz bandwidth might be beyond even the capabilities of Japanese engineers, but the ladder of improvement principle is now being applied to existing CTV sets and terrestrial transmissions. The immediate focus of attention has become the 'intermediate stages' which will start to affect our televi-

transmission end of things. For simplicity's sake, let's define the set improvements as IDTV, the transmission enhancements EDTV.

Historically, set-makers like to operate on an annual update cycle, each season bringing some new 'tweak' to tempt the punter and win brownie points over rivals, and recent technological developments are presenting plenty of opportunity to get the IDTV show on the road. In complete contrast, broadcasters take a more archaeological perspective on the passage of time, the implementation of any changes often requiring agreement from all sorts of national and international bodies and interests, and taking many years to come about.

However, the Tokyo area of Japan is already being served by several hours of 'Clear-Vision' EDTV transmissions a day. Fully compatible with existing NTSC standards, these transmissions pinch a slightly wider bandwidth to improve luma/chroma separation and provide control signals to avoid 'ghosting'. The large Clear-Vision receivers also have advanced scanning circuitry, using on-board framestore memories. CVTV set prices in Japan are about double those for a standard model of similar size in the UK, though these enhancements are currently only available on the largest size sets (66cm and upwards).

The European situation is slightly more

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complicated. The limited D2-MAC satellite transmissions provide one example of a first step towards EDTV, but no strategy has yet been finalised for E-PAL, PAL PLUS or whatever for terrestrial transmissions, even though a number of proposals have been discussed and researched. Assuming the whole satellite broadcast thing does get properly under way, MAC can be expected to grow steadily in influence and provide one important stimulus for better quality sets. But even if PAL remains 'unextended' for the next five (or even ten) years, there are plenty of improvements that can be made at the CTV end of things, and some are already starting to appear in the shops.

Large amounts (2+ megabit) computer style D-RAM memory is now comparatively cheap, allowing IDTV receivers to store a complete picture frame (or more). This has several implications, for example allowing signal processing such as noise reduction to be carried out after correlating the signals of successive fields or frames. However, the most important factor is that it frees the display circuitry (tube) from being locked into the timing and structure imposed by the broadcast signal itself.

Separating the tube scanning process from the constraints of the broadcast signal opens up three quite distinct possibilities, each of which significantly improves picture quality in its own particular way. The picture's horizontal line structure may be made much less obtrusive by inserting 'duplicate/interpolate' lines to double the total number displayed, bringing a subjective increase in resolution even though the drive signal may remain unchanged.

A second enhancement called 'progressive scan' (of which there is more than one variety) eliminates the interlace structure of the broadcast signals, whereby each 525/625 line 'frame' is built up from two 262.5/312.5 line interlaced 'fields'. Interlace itself was introduced to minimise large area flicker problems created by the limited scanning technology of the time, though it introduces its own form of flicker and other effects such as 'line crawling'. Progressive scanning presents the lines sequentially (at appropriately higher speed), so avoiding the time delay between successive lines that interlacing introduced.

These two approaches are arguably more important in NTSC areas, where the comparative coarseness of the 525-line presentation is the limiting factor, and where the 60Hz scanning rate makes large area flicker less obtrusive. The third technique simply doubles the scanning rate of the tube, repeating each frame twice in the time a normal set manages just once, and is particularly appropriate to PAL countries like the UK, where the 50Hz large area flicker problem is more serious than line structure inadequacies.

The 100Hz scanning 66cm Sony KV-FX29

is already on sale for a hefty £2,000, while European heavyweights like Philips, Thomson, Grundig and others have plans for 1990 100Hz 'flicker free' introductions. The subjective enhancements provided by just this first step towards IDTV is well worthwhile, presenting brightness without the attendant detail-masking harshness that limits conventional sets. The improvements in flicker is particularly noticeable on live sporting events (eg golf), where the sky becomes fatiguing to watch.

Scanning at 100Hz will represent the first IDTV step in Europe, but progressive and/or double line structure enhancements will soon follow, as will 16 x 9 format displays. Indeed, at the recent Berlin Funkausstellung, Thomson stole something of a march on its Euro/Eureka rivals by promising to market a 90cm 16 x 9 1250-line 'advanced TV' for £3,000 before the end of 1990. There's an element of market-inspired showmanship about this



*HDTV's 'widescreen' 16 x 9 aspect ratio will encourage closer viewing and greater involvement.*

announcements to be sure, since there will be very limited genuine 16 x 9 programming for a number of years, but it shows how quickly the manufacturers are starting to move.

The 16 x 9 Thomson *Vistascope* set is a flexible beast, the double speed 32kHz tube drive accommodating 625-line 100Hz, 625-line 50Hz progressive, or 1250-line 50Hz operation modes. However, Philips went one better on scanning speed at Berlin (albeit within the 4 x 3 625-line format) with a quadruple speed 64kHz *Matchline* prototype, capable of combining 100Hz and progressive scan enhancements. The picture quality is reportedly highly impressive, though the demonstration cheated a bit by using RGB drive; no launch date or price has been set, so we're probably waiting until '91 or '92.

One reason why European activity is getting under way at the receiver/picture display end of the chain is that any improvements here will continue to be

relevant and applicable whatever happens at the transmission end of the chain. These large, expensive, enhanced displays are effectively multistandard devices under microprocessor control. All that is needed is the necessary interface socketry and switching to accommodate 'black box' tuners and sources of any type, or the capability to add these internally.

If Berlin's best kudos was accorded the advanced CPT (colour picture tube) displays, there's a great deal going on in projection TV systems of one sort or another, particularly in Japan and the US. Projection systems are the only feasible route for really large screen displays, though the current level of technological development confers more than their fair share of limitations besides.

By the time you get to around 90cm (screen diagonal), CPT displays have become exceedingly bulky, heavy and expensive. For anything larger (and maybe cheaper as well), a projection system is the only solution, but there are two distinct types (front and back projection) and two different technologies (CRT and LCD), resulting in an almost bewildering range of options in a market which is still far from achieving consensus or maturity. For the sake of image size, projection systems sacrifice both brightness and resolution compared to current CPTs. For images from 80-130cms diagonal, bulky rear projection sets offer the convenience of standalone construction (handy for pubs, hotels etc), but 'coffee table' room projectors can throw a 200cm on to a screen in darkened domestic surroundings.

The various scanning enhancements discussed in relation to IDTV CPT technology are equally applicable to CRT-driven projection systems, but the LCD technology, promoted by many Japanese majors (Panasonic, JVC, Sharp, Toshiba, Sanyo etc.) operates under entirely different rules - it's not even a scanning system as such, and has totally different problems of resolution, refresh rates and so on.

The fact that there remains a fair measure of uncertainty at the European transmission end of things, with MAC only just starting to become established and no formal plans yet for E-PAL, is clearly not going to stop European (and Japanese) brands from introducing improvements in the picture quality of upmarket television sets for at least the next five years.

The real prize for moving MACwards is the eventual potential capability to transmit full HDTV signals. But with hundreds of millions of PAL CTVs currently in use, there is plenty of incentive to prolong PAL's active life, if you'll pardon the cliché, along the lines of the Japanese Clear-Vision NTSC initiative. A compatible E-PAL enhancement introduced in the mid '90s, around the time that HD-MAC should be starting to get underway, would be just the thing to keep the cycle of improvement going until the end of the century.

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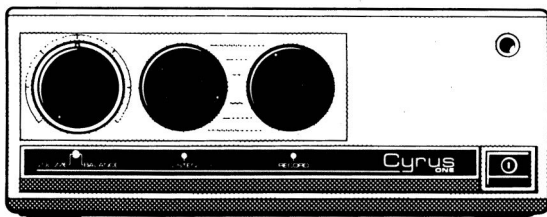
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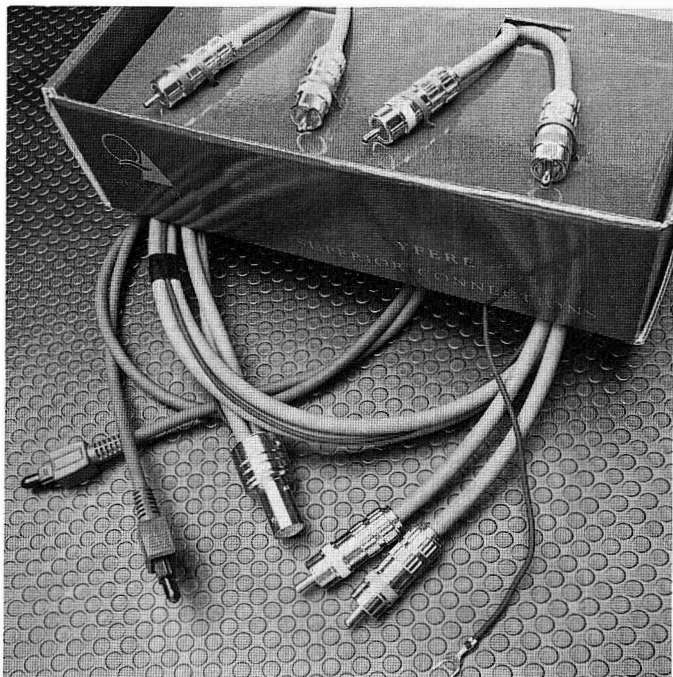
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The *Superior* range of cables really are a gorgeous addition to your hi-fi system. However, for those of you who are on a tighter budget there is also the YFERE *Super* range which uses the Twin wiring configuration but the leads are terminated with less elaborate plugs.

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

Also new to this country are *Furukawa* loudspeaker cables. All are two-core cables (twisted in the *FS2T20* and '35 versions, flat in the *FS2T09*) using PC-OCC wire with a high density polyethylene dielectric and flexible PVC jacket.

Thanks to an exclusive deal with Quantum Audio *Choice* is able to offer its readers these cables at discount prices. With the *Furukawa* speaker cables, you can have your leads terminated with 4mm banana plugs or spade connectors free of charge!

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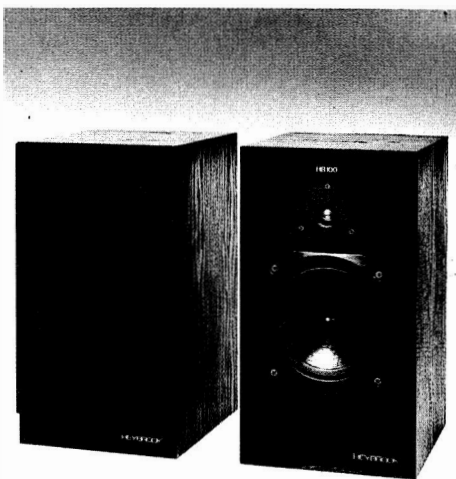
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# READERS WRITE CHOICE ANSWERS

## KAN II KAN

I am looking for a pair of good quality near miniature speakers suitable for shelf mounting.

A well respected Glasgow dealer tells me that in his opinion the £339 Linn *Kan II* is only surpassed in this class by the Acoustic Energy *AE1*.

I am surprised that in a listing of 150 speakers "The World's No 1 Guide To Buying Hi-Fi" has no comment to make on this model.  
D. R. TATTERSALL,  
BRIDGE OF WEIR

*We have in this very issue, managed to review the Kan II. So check out the main review section for our assessment of this 'cult' loudspeaker.*

*An alternative that we would recommend you listen to is the Royd Eden (£230), a wall mount near miniature with a brighter, some might say quicker, character than most. Alternatively the JPW Sonata is a very good speaker for its £99 asking price and easily worthy of a good quality front-end. It's remarkably transparent but lacks bass extension - we measured a -3dB low of 55Hz. But then again, few, if any, miniatures can dramatically improve on that.*

## CLOSET CLASSICS

Whilst being reasonably pleased with my present system, I would like to improve certain areas and would value your opinion. Currently I have a Dual *CS504/Ortofon OM10* turntable, Philips *CD450*, Sansui *CIB77* pre/power

amps and Ruark Sabre speakers on Target stands.

My musical tastes range from classical through to rock and I nearly always buy and listen to LPs, therefore the turntable would be my primary area for upgrading. My budget is approximately £1,500.

Hiding in the cupboard is a pair of Heybrook *HBI*s a Quad *22* preamp, FM radio and Quad *II* power amps. All are in perfect working order.  
PAUL OSBORN,  
LUTON, BEDS.

*A pair of Quad II valve power amps could represent a significant improvement over your current power amp, but the 22 preamp is probably best left in the cupboard. It doesn't hold up against modern preamp designs. If the socketry is appropriate have a go with the Quad IIs and your C77, it may surprise you.*

*The front end is most obviously in need of attention if you want to achieve a significant improvement in the overall sound. We would suggest you listen to the following two turntables: Systemdek IIXE and Voyd Valdi, both fitted with Moth arms and Goldring G1040 cartridges or something similar, and try to assess whether for your purposes the superior fidelity of the Voyd is worth the extra £400 it costs.*

*Then find a good valve preamp to use with the Quads - fine examples are made by Rose, Oakley, Concordant and Audio Innovations. Of course it's*



*Goldring's 10-40 - good enough for the best turntables.*

*important to listen to the system as a whole before you decide how much you want to spend, but as a general guide we'd be surprised if you weren't dead impressed with the Systemdek and an Oakley Image along with your Quads and Ruarks. To achieve a worthwhile improvement over that set-up would involve replacing the entire system.*

## BARGAIN BASEMENT

I would like to suggest that *Hi-Fi Choice* investigates an interesting piece of equipment that I have 'discovered'. It's a pick-up cartridge which as far as I know has never been reviewed in the UK but which might upset an applector or two. I might add that it's made in Britain by a well established company and is readily available in the shops. The only problem is that you will have to suspend any natural hi-fi buff's prejudices and be prepared for some doubts about your credibility if you like it!

The cartridge is the BSR *SC12M* (not to be mistaken for the higher output *SC12H*) - yes the ceramic one fitted to many cheap record players - and yes, the stylus can be turned over. It costs £7 or £8 and works best if the mounting bracket is removed and it's attached using a single bolt to a Rega tonearm. Then find an amp with a ceramic or crystal input (I use a fine old Rogers *HG88II*), and check the input impedance: the *SC12M* needs at least 3Mohms, so wire in series resistors as required to achieve this. Set tracking weight to 3.5g and find a record.

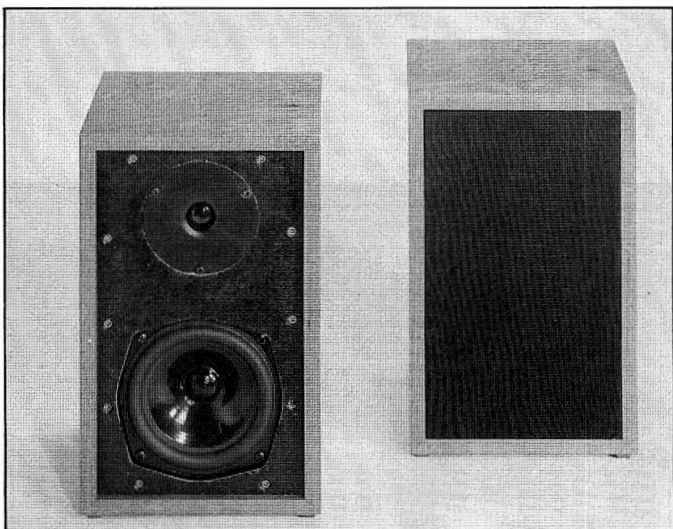
Suspend your disbelief and give it a decent innings - I'd be most interested to know what you think. I was quite taken aback at its sheer competence; the extreme treble is a bit limited but apart from that it delivers a surprising proportion of what the listener wants. Also bear in mind that it's dirt cheap, easy to use (no worry about the children), not bothered by dust, etc and it avoids a whole section of the preamplifier. I'm not saying it's a Koetsu beater or whatever, but it's worth listening to. Perhaps this quality could be put down to Tiefenbrun's theory that a good turntable and arm will make the most of whatever cartridge is used.

Suffice to say that in my own system the BSR was put in as an amusing experiment in place of the usual Rega *RB100* or Azden MC but it has ended up staying!  
ALASDAIR BEAL,  
CHAPEL ALLERTON, LEEDS.

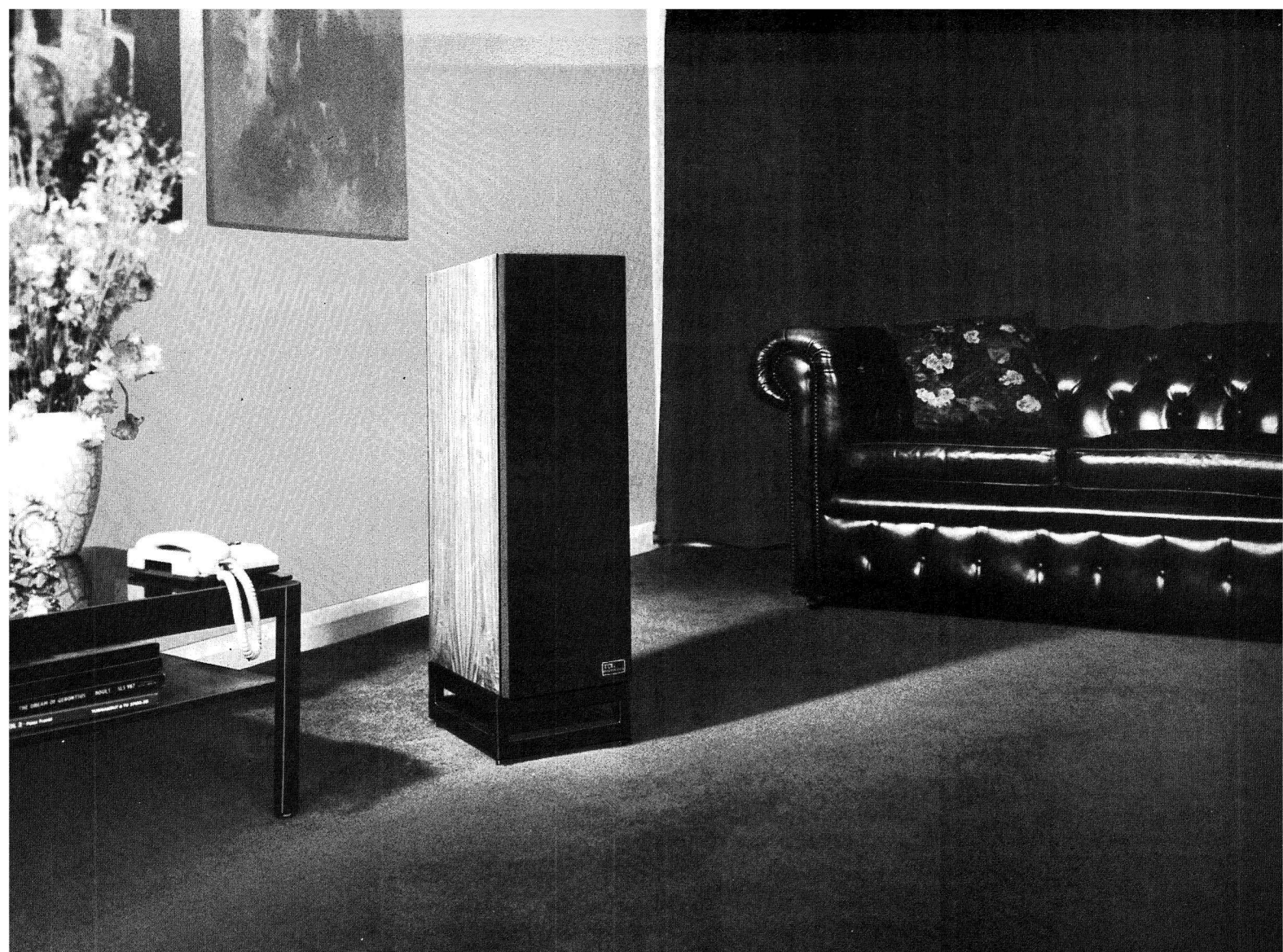
*Sounds interesting; we don't have any amps with appropriate ceramic cartridge inputs, but it certainly sounds like an option worth checking out. It may be wise to ensure that the stylus tip isn't so rough that it might damage your precious records. This is no more likely than with very cheap MMs but is worth bearing in mind, especially at 3.5 grams!*

## SERIOUS CD TWEAKS - THE SEQUEL

*Since printing Mr Foxon's letter (November '89 issue) about CD tweaks and his request for a*



*The Linn Kan II a love it or loathe it kinda speaker.*



## studio 1

The Studio 1 speaker is an unprecedented addition to the range of TDL transmission-line speakers, easily accommodated within the domestic environment. The TDL Studio 1 is a smaller, more affordable speaker that occupies no more floor space than a conventional speaker placed on a stand; yet its bass performance extends through the bottom octaves with the ease and authority for which the transmission-line is renowned. Similarly, the treble employs the same metal dome tweeter technology as in the professional TDL Reference Standard transmission-line speaker. Providing an aural illusion of a far larger sound source, the TDL Studio 1 places within reach, an authentic transmission-line speaker.

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source for some components, we received the following letter which includes other ideas on improving compact disc player sound.

The components that Mr Foxon is after can be ordered from STC Electronics Services (0279) 626777 or Audiokits (0332) 674929. Some of the modifications that I have carried out on my Philips 104 include: removing and isolating the mains transformer; replacing the NE5532 op amps with AD712s; wrapping the DACs in aluminium foil, taking care not to short out any pins; placing insulated aluminium foil between the main circuit boards as a screen and using solid core cable for mains supply. Bypassing the internal suppressor and connecting directly to the transformer further improves matters. And finally, mounting the player on a 14-inch diameter bicycle inner tube is an effective method of mechanical isolation!

M. BEARNE,  
NEWTON ABBOT, DEVON.

*Obviously such steps aren't for the faint-hearted and will have rather drastic effects on whatever guarantee that may exist, but on the other hand, tweaking is good fun and cheap. If anyone else out there has a good idea for improving the sound of any component send us a line.*

**DIGITAL UPGRADES**

Having read many reviews, I recently acquired a Musical Fidelity B200 and a pair of MC2 loudspeakers to use with my Philips 460 CD player on a Sound Organisation stand with Monster Interlink 200 and Linn K20 speaker cable (bi-wired).

I now have about £1,000 to spend on upgrading the CD

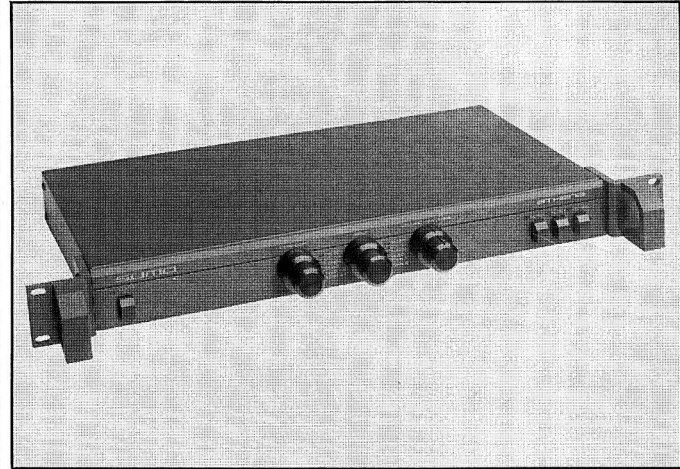
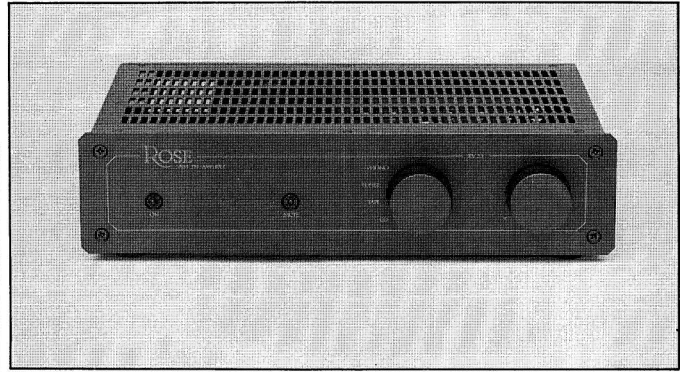
player. From what I can tell the combination of Arcam Delta 170 and Musical Fidelity Digilog seems to be one of the best CD playing systems available, appropriate to my budget. But I would like to know if there are any alternatives that I should listen to before taking the plunge with this system.

Secondly, should I change my cables, and if so what for?

PIERS MIDWINTER,  
LONDON.

*At the time of writing there is considerable speculation in the industry about 1-bit and other low-bit, or 'bitstream', digital-to-analogue converters. By all accounts this new system could shed a whole new perspective on CD replay, so we would strongly recommend that you listen to either a bitstream player or D/A converter before you buy a new machine. In fact, if this system is all that some make it out to be you may be able to make substantial improvements to your existing player, assuming it has a digital output. By the time this appears in print there should be several players and converters around. At present Rotel, Philips and Deltec have products that are close to production and we wouldn't be surprised if the folks at Sony also have something up their sleeves.*

*On the cables front, it would seem that individual components react to cables in a different way, which makes it very difficult to make specific recommendations unless the opportunity to experiment with the same components has arisen for us. This is an area where a good dealer can be very useful, as hopefully he/she will have tried out a variety of the options available and be able to recommend suitable cable*



Two distinctive alternatives for those seeking a fine preamplifier; the Rose RV-23 (top) and the Sumo Athena.

upgrades if necessary. As for your situation we suspect that an upgrade would prove worthwhile, but that you'd only achieve significant improvements with relatively expensive and carefully chosen wires.

**PREAMP PREVARICATIONS**

My present system consists of: Thorens TD125 II/SME 309/ Milltek Olympia, Denon DCD 910, Rotel RC870/two RB870s and a pair of DIY transmission line loudspeakers. I am considering upgrading to TDL Monitors and/or an Audiolab 8000C preamp, but not surprisingly I'm unable to find a dealer who can demonstrate these components together with Rotel RB870s. I would be interested to hear what you would expect of such a combination and whether there are any better alternatives.

On another note, I recently returned my SME arm because of a mistracking problem. When examined it was found that the cartridge wasn't set up as well as it could be, so SME aligned it perfectly and modified the arm to accept an SME IV damper. I was even privileged to hear it playing in MD Alastair Robertson-Aikman's system which was truly superb – to say that I was

impressed by the service offered by this company would be something of an understatement.

J. O. ELLIS,  
HORSHAM, SUSSEX.

*We haven't heard the combination of amps and loudspeakers that you are suggesting, but what we would say is that if you're looking for a genuine upgrade then you'll have to dig deep and splash out on something of the Kelvin Labs Absolute Zero or Sumo Athena ilk. However, if funds are tight we would suggest that you investigate some of the more affordable valve preamps on the market. The Rose RV23 (£395) (see December '89 issue) and Oakley Image S (£499) (see page 125) represent excellent value on the sound quality for money scale but will require some servicing (vis changing the valves) every couple of years.*

*The speakers should work well with either combination, but obviously it would be wise to seek out a demonstration even if it means travelling some distance to do so.*

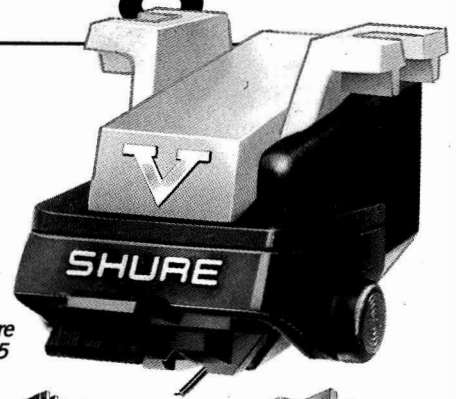
*Sounds like you had a good time at SME; they'll soon be inundated with Series II wielding enthusiasts hoping to hear ARA's system!*



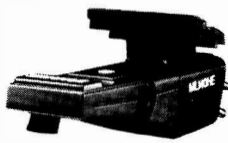
Rotel's RCD-865 could well be a bit better than 16-bit alternatives.

# Shure cartridges.

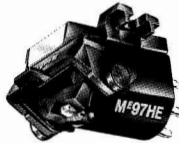
## Still the best on record.



Shure  
V15



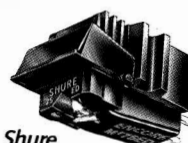
Shure  
ML140HE



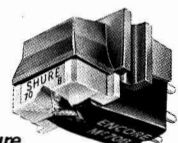
Shure Encore  
ME97HE



Shure Encore  
ME95ED



Shure  
Encore  
ME75ED



Shure  
Encore  
ME70B

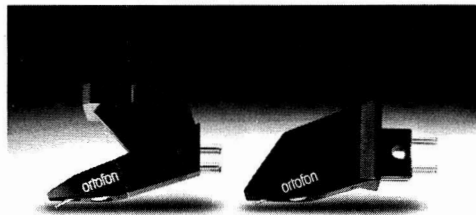
Whether you are an analogue or digital supporter, you have probably accumulated a substantial record collection. Chances are that some of these recordings will become irreplaceable. So it's essential that you protect them from unnecessary wear.

Shure Cartridges and styli have an unrivalled reputation for superb engineering and sound quality. So, if you want to get the best from your records and

keep them in pristine condition, here's a tip for future reference. Change to a Shure cartridge right away.

# SHURE

Contact your nearest Shure stockist or HW International  
3-5 Eden Grove, London N7 8EQ. Tel: 01-607 2717



## Optimum Match cartridges start by matching your tonearm. Perfectly.

Optimum Match cartridges start by matching your tonearm perfectly. But that's only the beginning. An OM cartridge from Ortofon makes it possible to upgrade the performance of an entire music system more easily than ever before. And with an OM cartridge, you hear the improvement at once. Music you've heard many times takes

on new dimensions. The term "high fidelity" is suddenly not only a description but an experience.

And the beauty is that an OM cartridge is certain to match your tonearm. And budget. The new Optimum Match series encompasses two categories: 3 standard mount cartridges, and 3 P-mount models. Ask your Ortofon dealer for a demonstration.



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# OPUS 3 CD OFFER

*Special offer to Hi-Fi Choice readers. Save money on Opus 3 compact discs.*

Opus 3 is a small independent Swedish record company famous for its high quality recordings of acoustic music such as jazz, folk and classical.

Opus 3's aim is to reproduce the natural sound of voices and instruments as accurately as possible. To do this they use recording environments with good and natural ambience, and very simple analogue recording techniques. These are purist 'audiophile' recordings where all forms of electronic manipulation that could change the natural sound and 'atmosphere' of the musical performances have been avoided. There are some 90 LPs in the catalogue – and some are now available on compact disc.

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

## CD-7810: GITARRKVARTETTEN – Transcriptions

A guitar quartet, formed by four Stockholm guitar teachers, presenting a completely new instrument family consisting of four differently tuned guitars. Using their own transcriptions, they play brilliantly through this recording of baroque, impressionist and Spanish music.

## CD-7900: TEST RECORD 1 – Depth Of Image

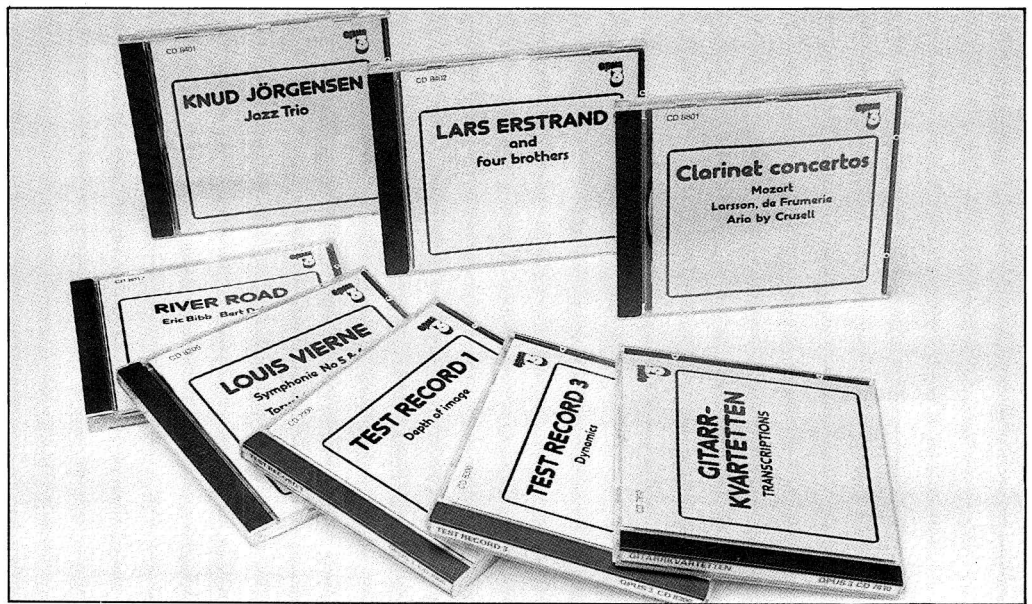
Full of unusual musical material produced with the idea of analysing hi-fi systems and their ability to reproduce depth of image. This is Opus 3's best selling recording, containing examples of the work of many of its recording artists.

## CD-8017: RIVER ROAD – Eric Bibb, Bert Deivert

Eric, with his roots in the blues and gospel, and Bert, who is influenced by folk and modern singer/songwriters, perform a selection of warm, inventive songs. A fulfilling sound is achieved with the use of just two acoustic guitars.

## CD-8300: TEST RECORD 3 – Dynamics

This is another Opus 3 compilation disc, with musical extracts carefully chosen to illustrate what is meant by musical dynamics and comprehensive liner notes to show you what you should be listening for. How good is your hi-fi system?



## CD-8401: KNUD JÖRGENSEN – Jazz Trio

Jörgensen is one of Sweden's best jazz pianists, featured here in a traditional trio with bass and drums accompaniment. Most of the pieces on this disc are familiar tunes on which Jörgensen stamps his own colourful temperament.

## CD-8402: LARS ERSTRAND – and four brothers

World famous swing vibraphonist Lars Erstrand with his successful jazz quintet featuring Roland Jivelid (tenor) Knud Jörgensen (piano), Arne Wilhelmsson (bass) and Pelle Hulten (drums). Timeless mainstream jazz.

## CD-8206: LOUIS VIERNE – Symphonies No 5 & 6

Louis Vierne (1870-1937) was one of the foremost organist composers of the late Romantic era. The organist is Torvald Toren who has studied under Flor Peeters in Belgium and Maurice Duruflé in France. Recorded in Hedvig Eleonora church in central Stockholm – the magnificent organ, built in 1975-6, has 58 stops, three manuals and pedals.

## CD-8801: CLARINET CONCERTOS – Mozart, Larsson and de Frumerie. Aria by Crusell

Kjell Fagéus, solo clarinetist with the Swedish Royal Orchestra, brings back the use of the basset clarinet (specially made for this recording) which was favoured by Mozart. The distinctive timbre of the instrument coupled with superb recording techniques therefore takes us closer to the sound of the music in Mozart's time. The other recordings here are later works by Scandinavian composers.

## TO ORDER OPUS 3 COMPACT DISCS

*(Tick selections)*

- CD-7810: Gitarrkvartetten – Transcriptions
- CD-7900: Test Record 1 – Depth of Image
- CD-8017: River Road – Eric Bibb, Bert Deivert
- CD-8300: Test Record 3 – Dynamics
- CD-8401: Knud Jörgensen – Jazz Trio
- CD-8402: Lars Erstrand – and four brothers
- CD-8206: Louis Vierne – Symphonies No 5 & 6
- CD-8801: Clarinet Concertos – Mozart, Larsson, de Frumerie, Aria by Crusell

## PAYMENT

- I enclose my cheque/PO made payable to Dennis Publishing for \_\_\_\_\_ selections at £12.95 each  
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Total \_\_\_\_\_
- Please charge my Mastercard (Access)/Visa (delete as appropriate)

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HFC Opus 78

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Please allow 28 days for delivery**



# MARKET RESPONSE

*In our exclusive market survey Dan Houston talks to specialist UK dealers about loudspeakers, asking about current trends and which are their best selling models.*

However, and wherever you get your statistics it would seem that the Exchequer's belt-tightening exercise is working in the loudspeaker market, if not elsewhere at the moment. Last month we reported the Audits of Great Britain Group saying that the home market for hi-fi separates had grown by some 17 per cent in the 12 months to August. AGB bases its reports on actual sales and at the time there was a feeling that the effect of high interest rates had not filtered through to the market place.

BREMA (the British Radio and Electrical Equipment Manufacturers' Association) told *Choice* that British loudspeaker manufacturers were now delivering significantly less product to the home market – reflecting a decrease in orders as dealers' business dwindles. BREMA puts the British domestic loudspeaker market down by 12 per cent this year compared to last. This was borne out by several dealers who replied to our survey. Many of them were hoping for better activity over the Christmas period and we heard from one that "things had better improve this month or we'll be looking at pavements from tall heights".

That's as far as the dealers are concerned. The overseas market is keeping the manufacturers within their top-floor windows by expanding slightly. BREMA says there has been a four per cent increase in British loudspeaker exports, most of which go to Japan and the Far East – confirming the theoretically ridiculous notion that Geordies will indeed buy foreign coal. It is pertinent to quote BREMA figures with loudspeakers because as far as the hi-fi market goes we do seem to be able to rule our own roost. Even Sony UK has most (98 per cent) of its models made locally.

Activity in the loudspeaker market however, is unprecedented. In every survey we notice that the amount of brands available in the UK has grown and grown, and presently numbers nearly 100 – with

multiples of that figure when you consider the individual models in the marketplace. We now spend slightly more (probably reflecting inflation) on loudspeakers – the average amount being just over £100 – up eight per cent from 1988 prices. However, only just over ten per cent of the loudspeaker market is represented with models costing £200 or more. Several of the 39 dealers who replied to our survey said something similar; for instance, Radlett Audio felt that large floor-standing loudspeakers were more popular. Other growing trends are with the satellite and subwoofer combinations which allow small mid-and-high frequency units to be on show while a subwoofer provides omni-directional bass from a hidden spot such as behind your armchair.

## RELIABILITY

Loudspeakers are the most reliable of hi-fi components – well, except for stands and cable – by virtue of the fact that they are mechanically very simple. There are no moving parts to snag up and if you hook them on

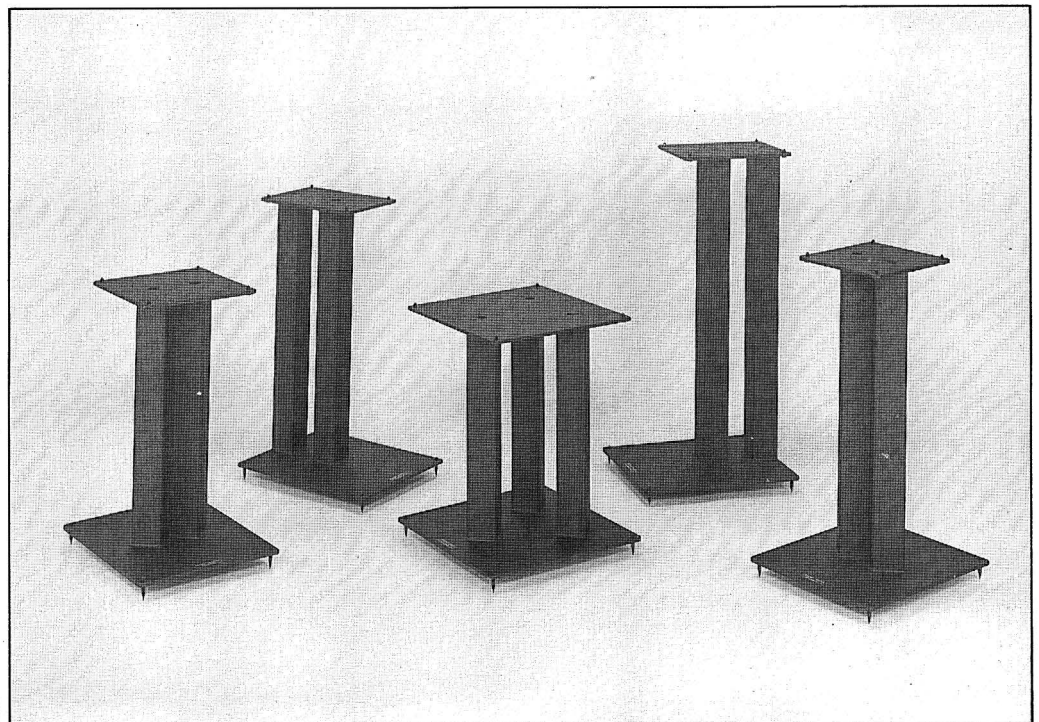
to a reasonably matched amplifier it will be pretty difficult to blow the drive units. Several dealers told us they never received faulty loudspeakers and some said that British manufacturers were now giving an informal permanent guarantee on their products by replacing the rarity of a blown driver with another free of charge. Others, such as The Cornflake Shop, are so confident about the brands they stock that they offer a full five-year guarantee themselves.

It would seem that quality control at the factory is also very good; dealers told us that where faults on delivery occurred it was usually due to damage in transit. Most faults are due to customer misuse – using an underpowered amplifier which produces distortion to blow the driver when the amplifier goes into 'hardclip'. Shirley McCombie, of Spatial Audio, told us: "being on Tottenham Court Road we tend to get the 'Acidy' JBL type customers who like to put the bass and loudness levels up full which distorts things". It is true therefore, that the more hi-fi

literate suffer less problems, and in part the reliability ratings reflect that, with established 'hi-fi' names coming out top over the more run-of-the-mill brands.

We asked dealers to name their least and most reliable brands and received praise for Mordaunt-Short from over half its dealers. Linn, Monitor Audio, Royd, JPW, Acoustic Research and B&W loudspeakers also received praise from a suitable proportion of their dealers while the only significant comments for unreliability were levelled at Wharfedale. Wharfedale also suffered in the last survey when the company pointed out: "Ninety per cent of problems are due to customer misuse – by the time someone is buying a Rogers or Linn loudspeaker they know far more about hi-fi and how to treat it. We are bound to have a higher failure rate because we cater for the cheaper end of the market".

The most important lesson here is to find a dealer who knows which loudspeakers will match your amplifier and to avoid widgets like graphic equalisers, tone controls and



*Gathering of the stands: Target's HJ range.*

loudness buttons which warp the signal when in the wrong (ie party guest's) hands. If your loudspeaker does break down most dealers will repair it themselves – often immediately if they have the parts in stock. On average repairs take just over a week and if the faulty item has to go back to the manufacturer then the figure given was still under two weeks. Fast service departments were given as Mordaunt-Short, B&W, Linn, KEF and Mission. A couple of commentators listed Musical Fidelity as being slow.

## STANDS TO DELIVER

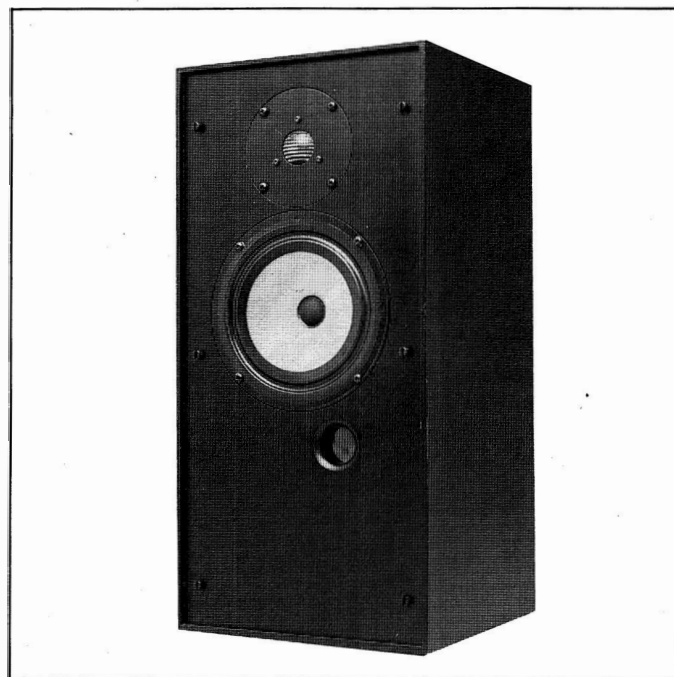
Loudspeaker stands are essential if you want to get the most out of your system, and we have heard some dealers saying that you should spend as much money on stands as the loudspeakers themselves. It's widely agreed that you could spend £100 on stands and £200 on the speakers with the result sounding better than a £300 pair of loudspeakers on their own. Mechanically coupling the transducer to the floor (preferably with spikes) is something of a black art with a host of different types on the market. You can therefore audition stands to see which kind (heavy or light) you prefer.

Rigidity is the aim and several dealers recommend the pre-welded approach as opposed to the type you bolt together. Many loudspeaker manufacturers make stands which are designed (rightly or wrongly) to suit their product and there are also several firms dedicated to isolation equipment. Among the latter Target's *HS Series* is most popular, with Foundation Audio, Stand Design, Apollo, Pirate and Partington following in that order. With loudspeaker manufacturers JPW, Linn and Heybrook stands were all listed as popular with their own as well as other loudspeakers.

Dealers told us that while it was difficult to sell stands with cheaper loudspeakers (less than £100) they could easily demonstrate the difference in sound quality by putting speakers on stands during a demonstration – several told us that many customers now bought stands with loudspeakers.

## ABLE CABLE

Along with budgeting for stands you should aim to link the loudspeakers to the amplifier with something other than bellwire. Many types of cable are available from the 99.99 per cent pure copper to the monstrous coils of snaking silver braid that sit behind the aspirational



*Rogers LS7t (top) and Monitor Audio's R852i (above) are consistent best sellers with the specialists.*

speakers of well-heeled audiophiles.

The best-selling (or most common) cable with our specialists is QED 79 strand which several said they would automatically supply with a new system. If you are after something a bit better it would be wise to audition cable as a final stage in putting a system together. While there is little scientific evidence that the type of cable will influence the sound many dealers advocate finding some speaker cable which is synergistic – or works with, rather than against your system. Many dealers say they can demonstrate the differences between cable and several use it as a tuning device – making the system sound much brighter or

warmer for instance.

The most popular more expensive types of cable are Linn *K20*, Rotel *Supra 4mm*, van den Hul, Monster and Monitor *PC*.

## THE BEST SELLERS

Our listing is based on dealers' three top selling models in each of three price brackets. The results are calculated on a points system. We noticed with CD players and cassette decks that certain models were far more popular than their nearest competition. With loudspeakers the situation is more even; in our budget price category the top five were as follows:

### Budget Category (up to £150)

- |                |    |
|----------------|----|
| 1) Mission 761 | 54 |
| 2) Tannoy E11  | 42 |

- |                        |    |
|------------------------|----|
| 3) Celestion 3         | 41 |
| 4) Mordaunt-Short MS10 | 32 |
| 5) Royd A7             | 32 |

### Mid price: £150-£300

- |                         |    |
|-------------------------|----|
| 1) Wharfedale 505.2     | 40 |
| 2) Tannoy DC2000        | 31 |
| 3) Linn Index Plus      | 26 |
| 4) Musical Fidelity MC2 | 22 |
| 5) Mission 761          | 20 |
| 6) Ruark Swordsman      | 20 |

### Top Price £300+

- |                                   |    |
|-----------------------------------|----|
| 1) Rogers LS7t                    | 31 |
| 2) Epos ES14                      | 26 |
| 3) Musical Fidelity MC4           | 22 |
| 4) Linn Kan II                    | 19 |
| 5) Mordaunt-Short MS55ti          | 18 |
| 6) Monitor Audio R852i<br>Gold MD | 17 |

In this category dealers stated nearly 60 different models as best sellers. Of the models listed only the Rogers *LS7t* and the (upgraded) Monitor Audio *852* have been best sellers in all five surveys.

## PARTICIPATING DEALERS

Our thanks to the following dealers for helping us compile this survey:

- Active Audio, Derby, Derbyshire.
- Aerco Ltd, Woking, Surrey.
- A. Fanthorpe Ltd, Hull, Humberside.
- Analog Audio, Finchley, London.
- Aston Audio, Alderley Edge, Cheshire.
- Audio Insight, Milton Keynes, Bucks.
- Audio-South, Farnham, Surrey.
- Bowers and Wilkins, Worthing, West Sussex.
- Brentwood Music Centre, Brentwood, Essex.
- Cambridge Hi-Fi, Cambridge.
- Chew and Osborne, Saffron Walden, Essex.
- Darbys Hi-Fi, St Albans, Herts.
- Elite Hi-Fi, Harrogate, N. Yorks.
- Erricks of Bradford, Yorkshire.
- Francis of Streatham, London SW16.
- Gilson Audio, Middlesbrough, Cleveland.
- Hi-Fi Centre, Wilmslow, Cheshire.
- Holborn Hi-Fi, Aberdeen, Angus.
- Hopkins Hi-Fi, Portsmouth, Hants.
- Horns, Oxford, Oxon.
- KJ Westone, London W1.
- Lyon Audio, Stanway, Colchester, Essex.
- Moorgate Acoustics, Rotherham, Yorks.
- Newbury Audio, Newbury, Berks.
- Norman Audio, Preston, Lancs.
- Now That's Hi-Fi, Portsmouth, Hants.
- Peter Russell's Ltd, Plymouth, Devon.
- Pro-Musica, Colchester, Essex.
- Radlett Audio, Radlett, Herts.
- Recording Playback and Monitoring, London SW11.
- Rogers Hi-Fi, Guildford, Surrey.
- Spatial Audio, Tottenham Court Road, London W1.
- Swift of Wilmslow, Cheshire.
- The Audio File, Bishops Stortford, Herts.
- The Cornflake Shop, Windmill St, London W1.
- The Listening Rooms, Old Brompton Road, London SW6.
- The Music Room, Glasgow and Manchester.
- University Audio, Cambridge, Cambs.
- Zeus Audio, Belfast and Dungannon, Antrim/Tyrone.

# AUDIOLAB

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*Call or write for information and details of your Audiolab dealer:*  
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26 Roman Way Industrial Estate, Godmanchester,  
Huntingdon, Cambs PE18 8LN. Tel. 0480 52521.







# CHOOSING AND USING . . . LOUDSPEAKERS

*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 co-operation 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 à 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.

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 pinpointing 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 could enjoyably combine a £500 remote control multi-source midi-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?

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 wall-backed 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 subtle and far-reaching.

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 '70s 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.



*The Celestion 3s – one of the smaller loudspeakers on test.*



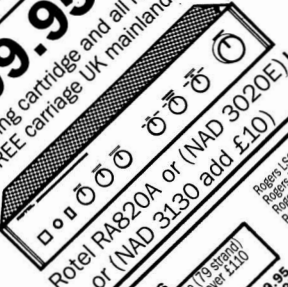
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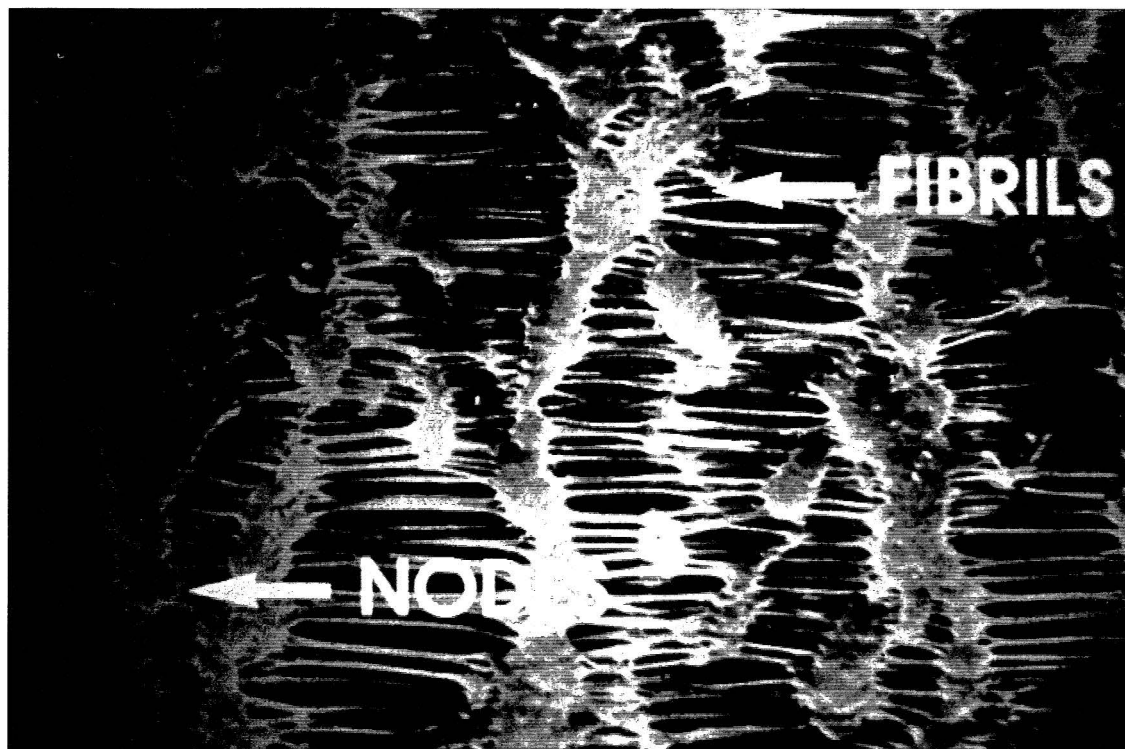
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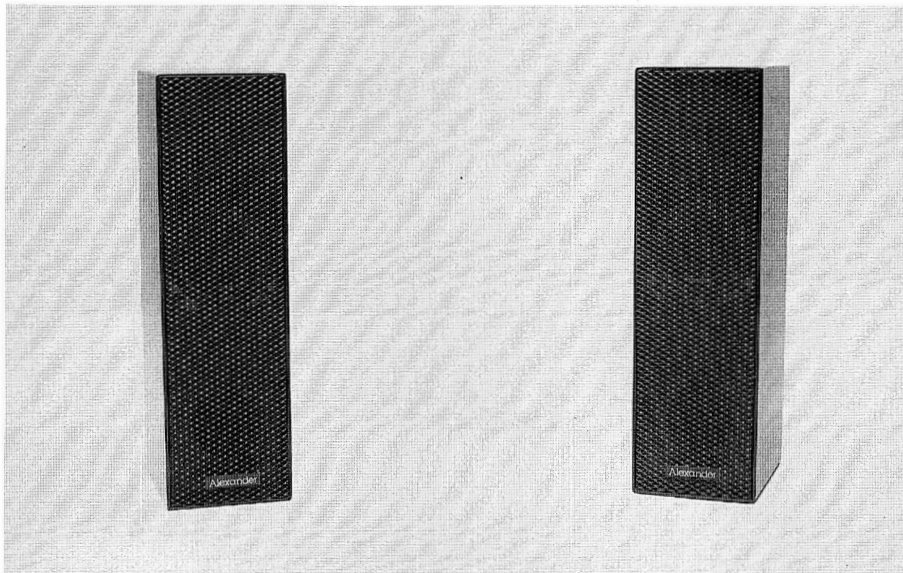
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# ALEXANDER SE5

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Alexander is a relative newcomer to the world of hi-fi, and its principal and designer is young, not to mention energetic and bubbling with ideas. The £190 SE5 is a member of a brand new 'second generation' range, though the similarity to its predecessors – specifically the 566 here – is far more marked than the distinctions.

Distinct this range certainly is, in shape, appearance and construction. In fact the cabinet is a steel wrap, somewhat in the shape of an amplifier set on end, being unusually slim though quite tall. One consequence, as the distributor was quick to point out, is that Alexanders contain their magnetic fields inside the case, and therefore don't interfere with television pictures, even if placed close to a set. Come to think of it, the SE5 makes a pretty good aesthetic match for the typical TV set too. Special narrow matching ALS stands with a generous spiked footprint are available, while the brochure also suggests wall brackets could be used; we tried the former.

The steel casework is mostly 1.5mm thick, with some 3mm laminate. Beneath the extruded metal grille – an essential do-not-remove and vandal-proof styling feature – the small drivers are actually bolted in place, pretty tightly on our samples, though prototypes such as these cannot be regarded as representative of normal build quality – or (fortunately) finish, which has distinct hair-shirt tendencies.

The 'soft port' looks a neat enough idea, consisting of a short length of fat and quite thick foam tubing, perhaps originally intended for pipe insulation work. Certainly it will neither rattle nor, I suspect, encourage turbulence. Re-siting the port on the front baffle should also benefit the near-wall site which is now the recommended placement, while the content of this particular paragraph more or less summarises the differences between 566 and SE5.

Inside the box is nothing much at all. No damping is applied to either casework or the enclosure space itself. It's an arrangement which is somewhat in vogue at present, though it seems inevitable that a measure of unwanted internal reflection will pass through the fairly transparent paper cone and colour the sound, even though the magnet will act as a partial block.

The only crossover is a simple high-pass network feeding the tweeter, hardwired and glued to its magnet. This is a small 19mm soft dome with short horn flare, while the bass is delivered from a 75mm paper cone on a pressed steel basket with generous magnet. Heavy cabling is used internally.

## TEST REPORT

The SE5 has a low sensitivity rating, albeit with a nice 'kind' impedance characteristic. Power handling is only adequate, so the overall loudness capability is several dB below average. The impedance graph shows that the 'soft port' has retuned the system to a slightly lower frequency.

The response traces show much the same characteristic as previous Alexanders, peaking up at 1.5kHz, dipping through the crossover region and then again slightly prominent in the mid treble. Despite our previous 566 findings, the SE5 works very well back against the wall, balancing the bass out really well down to 50Hz at the expense of a small 75Hz peak and 400Hz trough. You get nothing much at all below 50Hz, which is a sensible compromise in view of the tiddly little main driver. Somewhat unusually, the traces in the larger room at a greater microphone distance are significantly smoother than those in the small room.

Given the slim but tall baffle, the response is inevitably more uniform laterally than vertically. However, it is interesting that the crossover suckout is largely filled in when measured above or below (rather than

directly on) the main measuring axis.

## SOUND QUALITY

The 'differentness' of this Alexander was perhaps responsible for the rather inconsistent reaction of the listening panel. Averaged out, the cons held a majority over the pros, but all were agreed that the wall balance was very good.

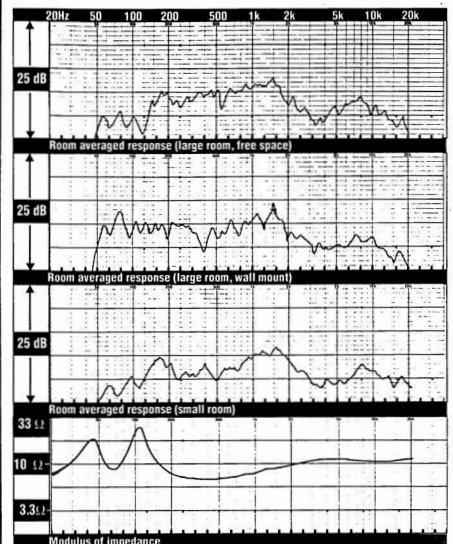
Real bass extension is not on the menu, but the much more important region above 50Hz is well enough handled to give a fair impression of scale, all things considered, along with decent speed, explicit detail and good information, the ALS stand providing the best match. The down side is that the presence band is mangled and coloured, much as with its predecessor, bringing an unwelcome 'hardness' and 'boxiness' along with some congestion and confusion, especially on complex material.

## CONCLUSIONS

An interesting niche product particularly well suited to surround sound A/V applications, Alexander can give any miniature a run for its money on bass performance, but midrange hardness and coloration mars otherwise good detail and clarity, and the price seems a little high.

## TEST RESULTS

Size (height x width x depth)	40.5 x 12 x 15cm
Recommended amplifier power	20–60 watts
Recommended placement	on AS stands near wall
In room averaged response limits 50Hz–10kHz	±5dB
Large room/space LF rolloff (–6dB ref midband)	52Hz
Large room/wall LF rolloff (–6dB ref midband)	48Hz
Small room LF rolloff (–6dB ref midband)	60Hz
Large room output at 20Hz (ref midband)	not measurable
Estimated midrange sensitivity (ref 2.83v, 1m)	82dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	fairly good
Typical price per pair (inc VAT)	£190



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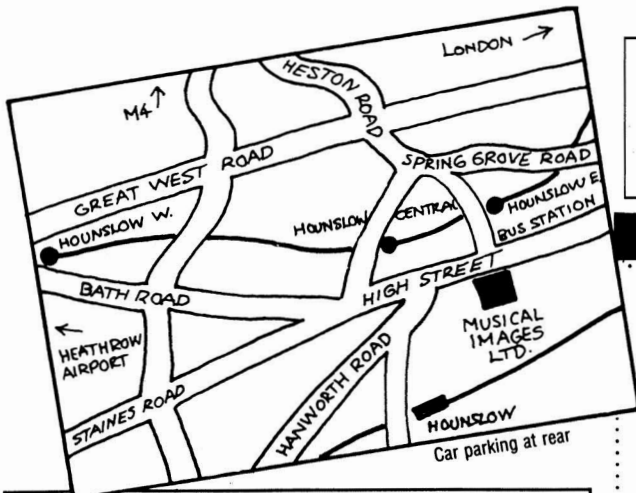
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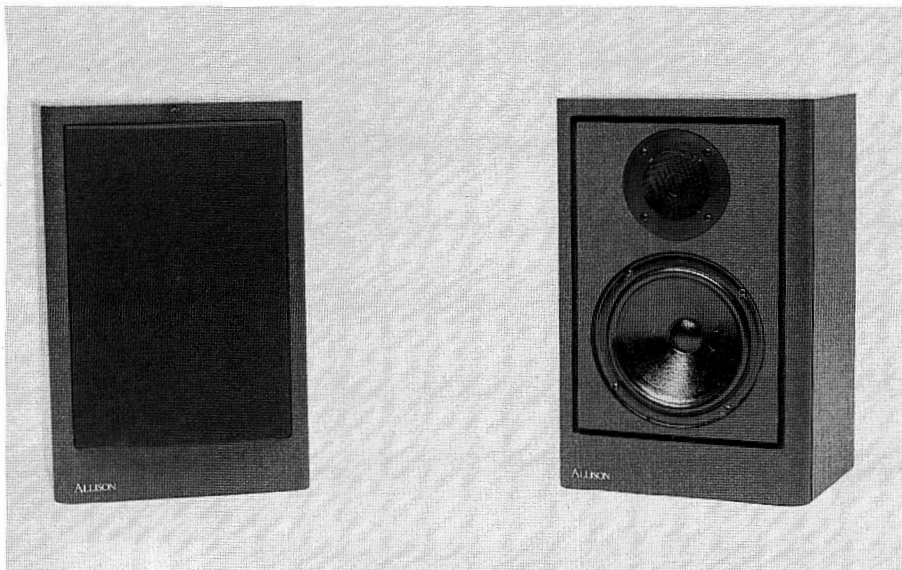
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# ALLISON AL105

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Roy Allison, moving force and designer of the loudspeakers which bear his name, must surely qualify as one of the Grand Old Men of hi-fi these days. His original roots go back to the early days of AR, doyen of the East Coast US 'sound', while the subsequent eponymous designs have preserved much of that drive unit philosophy whilst concentrating strongly on maximising in-room performance with close-to-wall siting. This has led to some odd shapes and driver configurations further up the range, including the £300 *CD6* 'cube' which was Recommended in our *June '89* tests, though the little £150 *AL105* reviewed here is a much more conventional proposition.

Though I have no propaganda to hand, save that which dropped out of the carton, the *105* is the smallest in a six-strong *AL*-series range of models, with more or less conventional appearance and steadily increasing size and driver content, aligned for wall siting in the Allison manner.

It's a simple two-way, sealed box, small bookshelf model, and someone has clearly gone to plenty of trouble over the cosmetics. The grille looks a shade impenetrable, with light fabric stretched over a perforated plastic frame, but it's clever enough to avoid introducing reflections. If you prefer to take this off, the baffle looks very pretty underneath, attractively shaped and with inset driver faceplates for good acoustic properties, and finished in a flecked mid grey. The tweeter has its own mesh grille.

Promising acoustically, I am less happy about the mechanicals. Maybe the tweeter is meant to be left untightened, though it doesn't strike me as a particularly good idea. The baffle is 21mm chipboard and the sides 17mm, which should be tough enough, but the small bass/mid driver with its heavily doped 120mm paper cone is fixed with little woodscrews, and the one I took out had already been rotated and re-screwed once,

into the rather flimsy board. Nearly all Allison models use the company's unique house tweeter, but not the *105*. To get the Allison 'nipple' you have to go up one size to the £200 *AL110*, the tweeter here being a rather inconsequential looking plastic annulus/dome lurking under a phase compensator.

## TEST REPORT

Sensitivity is just about average, while bass extension is good for the box size, but inevitably the price is paid in a lowish impedance characteristic. Though pretty to look at, the grille has a significant effect, so it's just as well the underneath is well finished.

Allison are arch-proponents of wall siting, and the *AL105* shows the expected good wall alignment – out in space the balance is distinctly mid-prominent. However, the overall responses are rather marred by a distinct 'three-humped' character with a fair amount of unevenness, and a rather ragged treble. The best room balance was found in the smaller test room. Off-axis responses are well enough ordered, favouring a listening height close to the main axis, slightly off-axis horizontally.

## SOUND QUALITY

While the preference for against-the-wall mounting was amply confirmed, there was little real enthusiasm for the *105* in the listening tests, and subsequent auditioning continues to leave me underwhelmed. Several listeners were upset by significant mid-band coloration – specifically a degree of nasality – which is hardly surprising in view of the frequency balance.

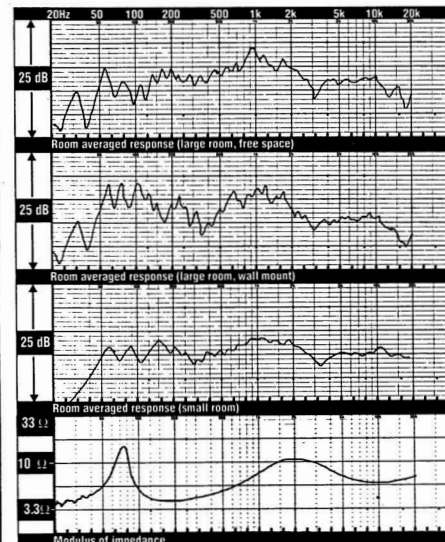
The bass possesses good extension, especially considering the modest box size, but also somehow lacks the authority, precision and weight needed to create a large scale impression. Although quite lively, the sound is also rather untidy and messy, while a degree of unwanted treble exaggeration is another source of criticism.

## CONCLUSIONS

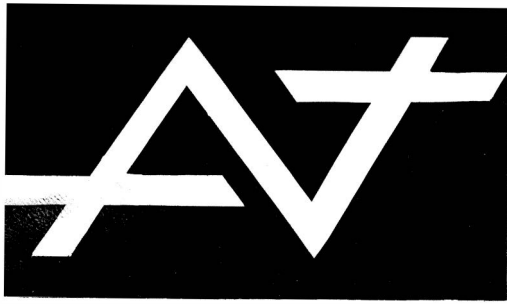
Pretty enough in appearance, sonically the *AL105* doesn't really make the grade at the £150 asking price. Some of the blame for this must surely come down to the tweeter, though it's also a design which seems to place more emphasis on acoustic than mechanical performance.

## TEST RESULTS

Size (height x width x depth)	37 x 24 x 21cm
Recommended amplifier power	15–100 watts
Recommended placement	high stands against wall
In room averaged response limits 50Hz–10kHz	±6dB
Large room/space LF rolloff (–6dB ref midband)	46Hz
Large room/wall LF rolloff (–6dB ref midband)	43Hz
Small room LF rolloff (–6dB ref midband)	45Hz
Large room output at 20Hz (ref midband)	–14dB
Estimated midrange sensitivity (ref 2.83v, 1m)	87dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	good uniformity, indifferent response
Typical price per pair (inc VAT)	£150



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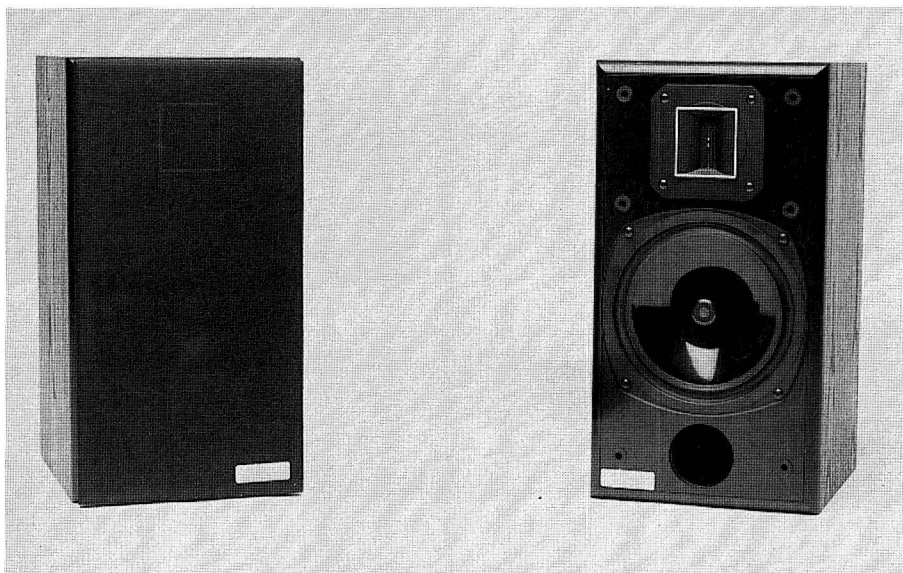
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Best known for its tonearms and turntables, Alphason is steadily building a reputation as supplier of a full range of quality upmarket components, each of which is imbued with a characteristically 'no nonsense' northern accent.

It's more than six months since Alphason's *Orpheus* badge sliced a few layers of skin off a couple of my fingers, leaving me thankful I don't use ten fingers to type. Noting that the *Amphion's* badge is as sharp as ever, I have fortunately learned my lesson about carefully handling Alphason loudspeakers, and all digits remain intact.

*Amphion* is really just a scale model *Orpheus*, sharing the same smart and luxurious presentation but occupying half the volume. The German made ribbon tweeter is again used, but in a normal cabinet mounting in place of the odd square tube sitting on the top and providing time alignment, as in the more expensive model.

I recall thinking the *Orpheus* was a little on the expensive side, and must say the same about the £680 *Amphion*. But there are some very nice touches in the presentation, notably the radiused hardwood edges to the baffle, good quality bi-wire terminals and the like.

The tweeter is obviously a selling point, since ribbons seem to be becoming increasingly fashionable, though the item in question is generally enough available. The bass/mid driver has a conventional enough cast frame and 155mm plastic cone, but the phase correction plug which protrudes from the pole piece in the centre is a little unusual, and should provide some high frequency extension (useful, since the tweeter comes in at a quite high frequency).

Grilles are supplied, nicely chamfered though thick in profile, but the speaker really looks too nice unclothed to encourage their use. It's unusually solidly built for a ported enclosure, with 20mm baffle and 16mm sides

in MDF, a circumferential brace stiffening the baffle between the two drivers. It makes a refreshing change to find drivers properly tightened down, using generous screws and T-nuts. Bi-wire/amp connections are provided on the rear, while the 'crossover' takes minimalism close to its logical conclusion, with just a single generous inductor to roll off the upper end of the bass/mid driver. But surely there's some inconsistency in using special internal wire and then tag-connecting it to the driver via a fuse?

## TEST REPORT

The sensitivity is a dB above the test group average, though the low and current hungry impedance characteristic requires the sort of decent quality power amplifier a speaker like this deserves. There's nothing much in the way of deep bass, there's some 100-200Hz 'warmth', a degree of midband 'lumpiness' and a slight mid treble boost, but the overall response is pretty well balanced, tending just slightly towards the 'three-humped' characteristic. Wall siting usefully fills in the 50-100Hz octave.

The lateral off-axis responses also reflect careful alignment, giving best results at about 30 per cent – the apex of the equilateral stereo listening triangle, with the speakers mounted square with the wall. The vertical traces show greater variation, favouring placement at or a little above the listening seat. The grille has little effect, though it does reduce output slightly just on the 4kHz crossover point.

## SOUND QUALITY

Although no-one was over-effusive with praise, the *Amphion* was well liked by all panelists for its relative freedom from unpleasantness and thoroughgoing listenability, with a high enough rating to go a long way towards justifying its price. There's a lack of true weight and a slightly 'obvious'

treble, but the whole thing sounds rhythmically true and involving – bouncy, rather than meaty, beaty or big – with fine inherent pace despite a slightly 'laid back' presence.

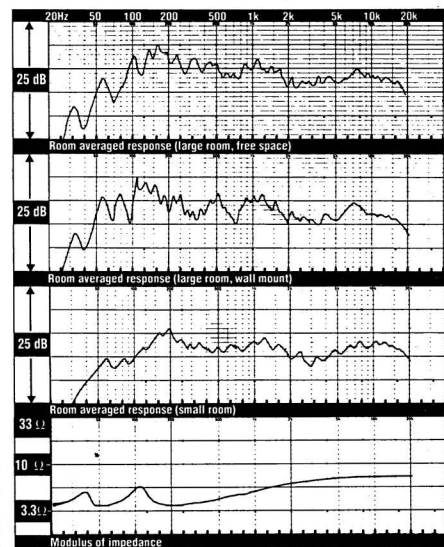
A tendency towards 'chestiness' and 'plumminess' was also noted, though later listening suggests that this was due to stand interaction, and things speeded up significantly on lightweight stands. Stereo imaging is clearly well above average, despite the handicap a wall site tends to impose. And the ribbon *does* sound 'different' from conventional domes, so you owe it to yourself to check this factor out.

## CONCLUSIONS

For the same price as the *Amphion* and a decent pair of stands it is possible to get a significantly larger box with more bass 'welly'. But it's unlikely to sound significantly better than this attractively balanced and presented model. Not the most dynamic or ballsy contender at the price, it nevertheless has unusual transparency and subtlety for a compact wall mount. Certainly worth considering, it is just a shade too expensive for formal Recommendation.

## TEST RESULTS

Size (height x width x depth)	44 x 23 x 27.5cm
Recommended amplifier power	20–80 watts
Recommended placement	on high stands against wall
In room averaged response limits 50Hz–10kHz	±4dB
Large room/space LF roll off (–6dB ref midband)	50Hz
Large room/wall LF roll off (–6dB ref midband)	45Hz
Small room LF roll off (–6dB ref midband)	50Hz
Large room output at 20Hz (ref midband)	–25dB (est)
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	fairly good
Typical price per pair (inc VAT)	£680





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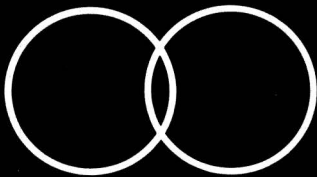
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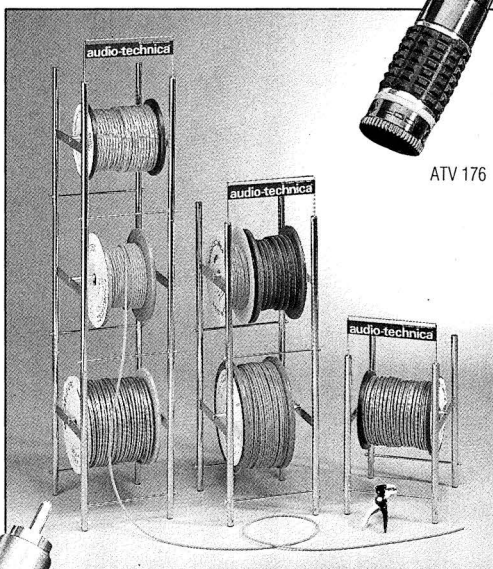
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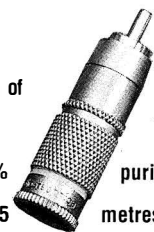


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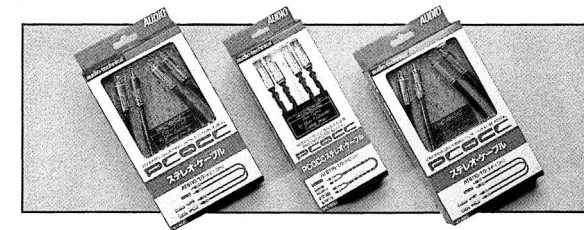
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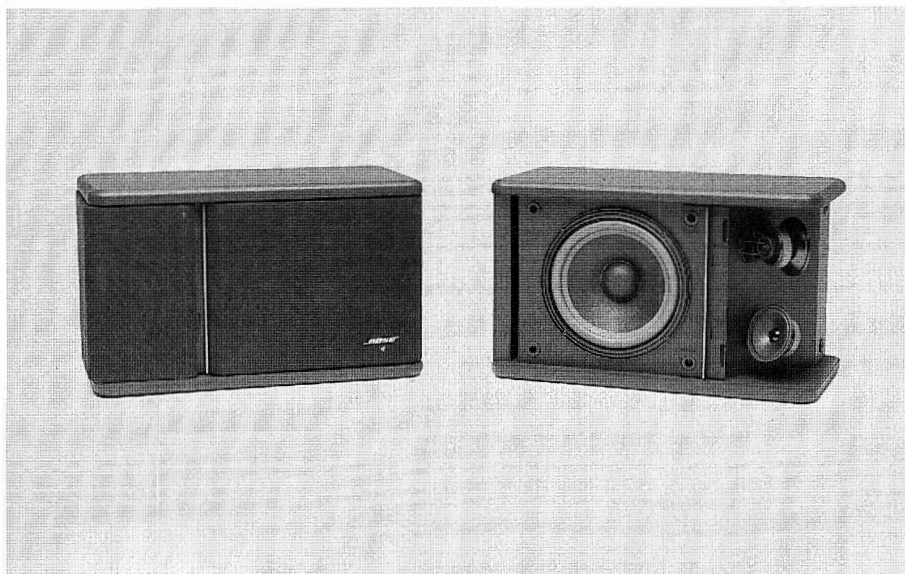
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Back even before the mists of time, I dimly recall a Bose 301 being the first loudspeaker – indeed the first product – I ever reviewed in a hi-fi magazine, I think it must have been around the time that *Hi-Fi Choice* first saw the light of day... Such is nostalgia. But such also is the consistency of the Bose design philosophy, for this 305 bears more than a passing resemblance to its distant ancestor. The price seems to have gone up rather more steadily than inflation, however, the 305 now costing a pretty substantial £350.

In fact, the accompanying (unusually informative) instruction sheet was written for the earlier 301 Series II, with just a loose inset adding 305-specific data. Which might be taken to imply that this old stager may not be the most important model in the current Bose line-up, though if that were the case, would they have bothered with the substantial redesign tooling investment?

Although it's one of the company's simpler and cheaper models, it nevertheless follows the Bose tradition of unusual driver configurations, two-way system it may be, but there are actually two tweeters each side, and neither is baffle mounted. In fact the whole cabinet is turned on its side, so to speak, with the bass/mid driver pointing forward, and the tweeters mounted on a baffle set outwards at 45 degrees to straight ahead.

The original 301 used a bizarre reflecting 'paddle' to alter the treble distribution (and contribute variable coloration), but thankfully this has now been abandoned. Instead, the tweeters here are stuck out on stalks (I jest not), so that they actually fire along the line of the angled baffle – one forwards and therefore towards the apex-seated listener, the other in the opposite direction, presumably to splash around the walls.

Such a side by side configuration will inevitably blur stereo precision, despite the mirror-imaging of the pair. It will also increase room interactions, which is more a

matter of taste. The corollary is also that the sound balance will be relatively independent of the height of the listener while varying rather more than conventional models across the horizontal axis of the soundstage. More important still perhaps, the speaker can be mounted high up and out of the way on wall brackets, while still delivering a reasonable balance.

The main changes for the 305 are claimed to be the replacement of chipboard by a moulded vinyl cabinet, with appropriately modern cosmetics (including a red stripe) and a redesigned 'slot' port loading. In fact the vinyl seems to have been used rather selectively, and the baffle for starters remains a rather flimsy chipboard panel. The main driver has a decent magnet and 150mm doped paper cone, with generous foam roll surround, and was pretty securely fixed, albeit with nasty little wood screws. The tweeters are cone/dome devices, the cone serving as a baffle for the most part, solidly mounted on cast 'stalks'. The grille is neatly designed for minimal degradation, despite the complexity involved.

## TEST REPORT

A highish sensitivity and 'kind' impedance characteristic together with good bass extension for the box size sets the 305 off in a good light. Though a shade 'rich' in the upper bass region, the balance responds pretty well to either wall or free space siting. There's a fair amount of unevenness here and there, with the lower treble a little depressed and the upper treble distinctly ragged – an inevitable consequence of the odd driver array, I suspect. Off-axis traces are a shade unpredictable, especially the treble level variations across the lateral axis: careful experimentation may be needed to get the best results.

## SOUND QUALITY

The British hi-fi establishment has always

suffered slightly from a condition known as Bosephobia, but blind listening tests know no prejudice, and it was therefore refreshing to find the 305 well liked by all – a finding which subsequent sighted listening only serves to endorse.

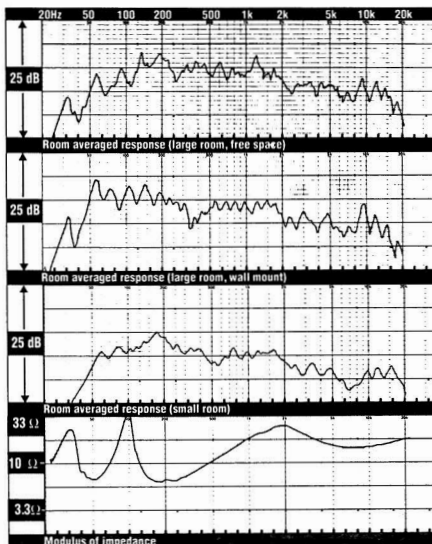
The fine room balance with respectable bass extension irrespective of site (or stand type) is a good start. Although dynamics aren't totally convincing it's still a lively loudspeaker with a good sense of timing and headroom to spare. There's a good impression of scale, enhanced somewhat by the slightly odd but not unimpressive stereo. Purists, however, may well find the top a little too untidy for comfort: it certainly does nothing to enhance the string sound on classical recordings.

## CONCLUSIONS

This is a difficult speaker to summarise. Its direct/reflect presentation is sufficiently 'different' – and more than a shade room sensitive – that it ought certainly to be auditioned prior to purchase. The treble quality lacks subtlety too, but there's the same liveliness through simplicity that has always characterised the 300 series, and a fine room-match to boot, so Recommendation is clearly in order for a clever, well developed, if idiosyncratic design.

## TEST RESULTS

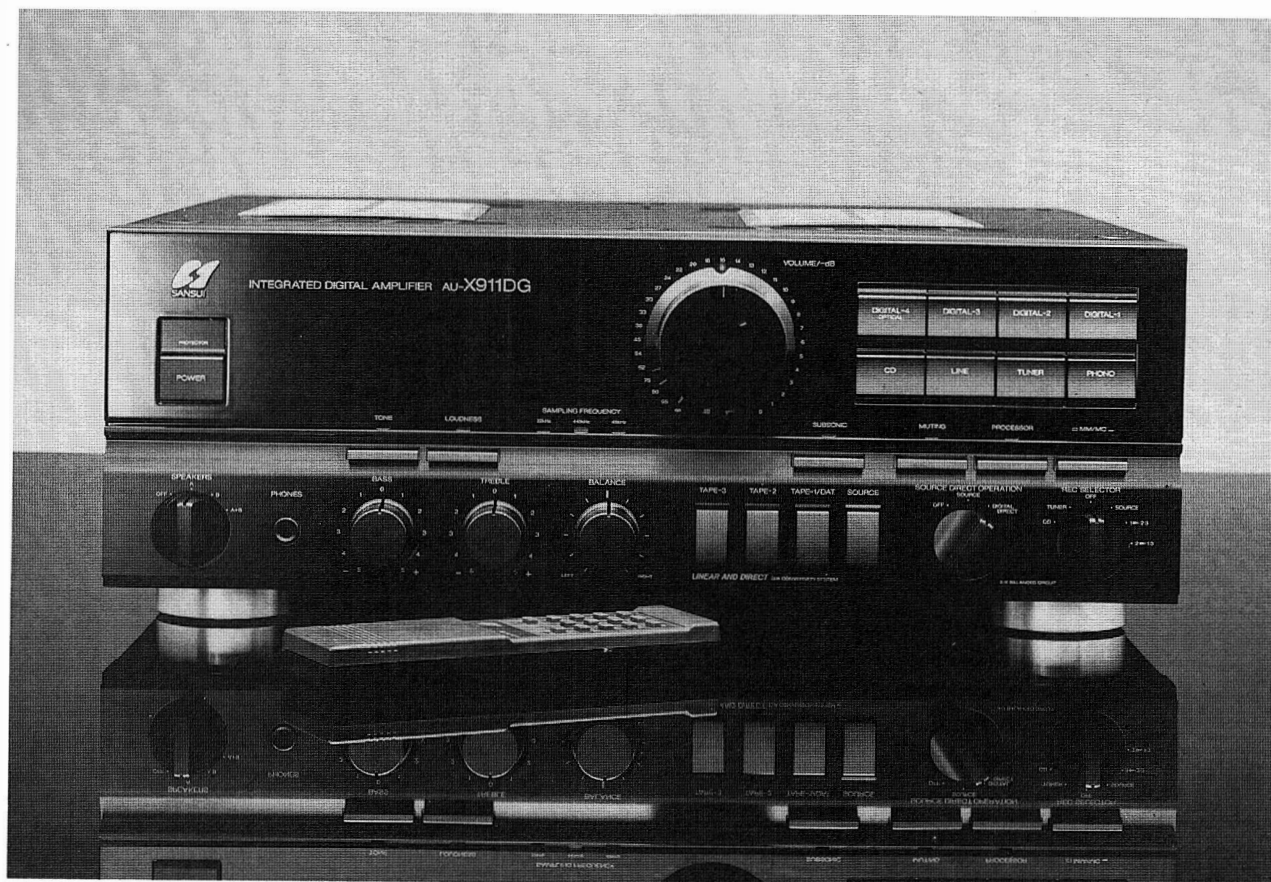
Size (height x width x depth)	28 x 45 x 23cm
Recommended amplifier power	15–100 watts
Recommended placement	high stands near rear wall
In room averaged response limits 50Hz–10kHz	±5dB
Large room/space LF rolloff (–6dB ref midband)	48Hz
Large room/wall LF rolloff (–6dB ref midband)	30Hz
Small room LF rolloff (–6dB ref midband)	48Hz
Large room output at 20Hz (ref midband)	–18dB
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	fair
Typical price per pair (inc VAT)	£350





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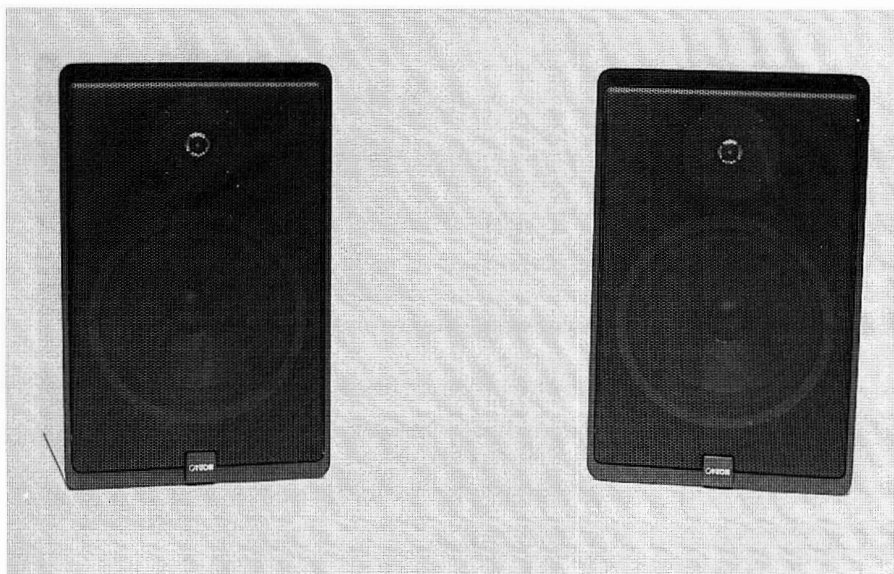
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# CANTON KARAT 30

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Canton is a major West German brand that was originally founded by ex-Heco personnel, several aeons ago. It's something of a newcomer to the UK market, no doubt partly because our strong indigenous manufacturing base has historically made it difficult for foreign brands to get established. Yet this is the fifth Canton model *Choice* has assessed over the past couple of years, and every one looks almost identical: more than mere house style; this is tantamount to a house obsession.

Within the Canton hierarchy, the £360 *Karat 30* sits one above the *20* (which we liked) and one below the *40* (which we didn't like so much). Through being a two-way design (like the *20*) in a box size closer to the (three-way) *40*, there's at least a reasonable chance that it will combine the best elements of both.

Ennui apart, the dense black shiny finish presents a smart if slightly sombre face to the world; a reddish real wood veneer is an attractive £20 optional extra. The box looks a trifle tubby, but is helped by golden ratios and radiused edges. The neat perforated metal grille ought not to pose a threat to the acoustic performance, slotting neatly into a baffle groove, and makes no effort at all to hide the drivers, though it does ensure protection against probing fingers. The speaker looks smart and equally well finished with or without it in place, the baffle being finished in a dense black flock.

Unlike its immediate family, this is a ported enclosure, the small and cunningly disguised offset orifice placed next to bass/mid and treble drivers on the baffle. In fact it looks a bit of an afterthought, since there's no attempt to tune its length, relying merely on the baffle cut-out, while the enclosure itself is quite densely stuffed with acoustic wadding.

The main driver has a nice six-screw die-cast basket but a rather old-fashioned look-

ing 155mm (shallow, flat and paper) cone. By way of contrast, the tweeter is a 25mm metal dome, complete with phase compensator. Both are neatly recessed in the baffle, which is good acoustically, but the routing out has left only 8mm of purchase for the little woodscrews. The box itself is constructed from nice dense 18mm MDF, but I'm not surprised the mounting screws were only half tightened. A tidy PCB crossover sits inside the rear panel, with heavy gauge wire to and from the drivers.

## TEST REPORT

Sensitivity is a shade above average, and bass extension generous for the box size, but the usual price of a low, European-style 40hm impedance characteristic will ensure that plenty of current is demanded of the powering amplifier.

The responses are dominated by a 'rich' mid and upper bass region, which is retained whatever the siting. Elsewhere the responses are pretty smooth and flat, with some crossover notching at the furthest measuring distance. Furthermore, the 'flat' treble in-room traces seen here are common amongst German designs, but are significantly 'brighter' than the rolled off HF balance which seems to be favoured by UK listeners and manufacturers. The perforated metal grille helps to suppress a little of the extreme treble 'sting', as does a seat a little to the side of the main axis, though not too far above or below, where the crossover notch starts to become exaggerated.

## SOUND QUALITY

The *30* didn't manage to catch the imagination of the panel in the way its smaller brother had done, but it by no means disgraced itself either. However, there was a fair measure of disagreement amongst the panelists, some relishing the scale of a warm, rich, smooth and 'civilised' balance, others react-

ing against the touch of 'boom'n'tizz' that is another inherent characteristic. There was even disagreement over whether it sounded better in free space or against a rear wall, which suggests it may be equally suited (or unsuited) to either.

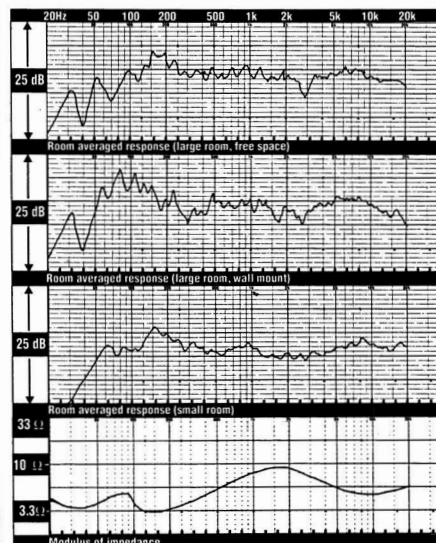
Its real strength is a generous soundstage with good space and some transparency, giving impressive stereo imagery especially with large scale orchestral material. Solid pillar stands are necessary to achieve the best results, but even under 'best' conditions the bass and lower mid never really come together to give a tight and rhythmic presentation on rock material. And with or without a blindfold, this particular condemned man will find it difficult to avoid or forgive the laser-like treble.

## CONCLUSIONS

In overall balance terms the *30* is rather less successful than its smaller brother, applying something of a 'loudness' contour which is quite engaging at lower listening levels but starts to pall as the dynamic range is explored, while the smoothness and richness clearly suits classical material better than rock. Though presentation is first rate, the basic mechanical build quality is a shade disappointing considering the substantial price of a simple enough model.

## TEST RESULTS

Size (height x width x depth)	42.5 x 26.5 x 28cm
Recommended amplifier power	15-100 watts
Recommended placement	uncritical, on solid pillar stands
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
Small room LF rolloff (-6dB ref midband)	48Hz
Large room output at 20Hz (ref midband)	-12dB
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	fairly good
Typical price per pair (inc VAT)	£360



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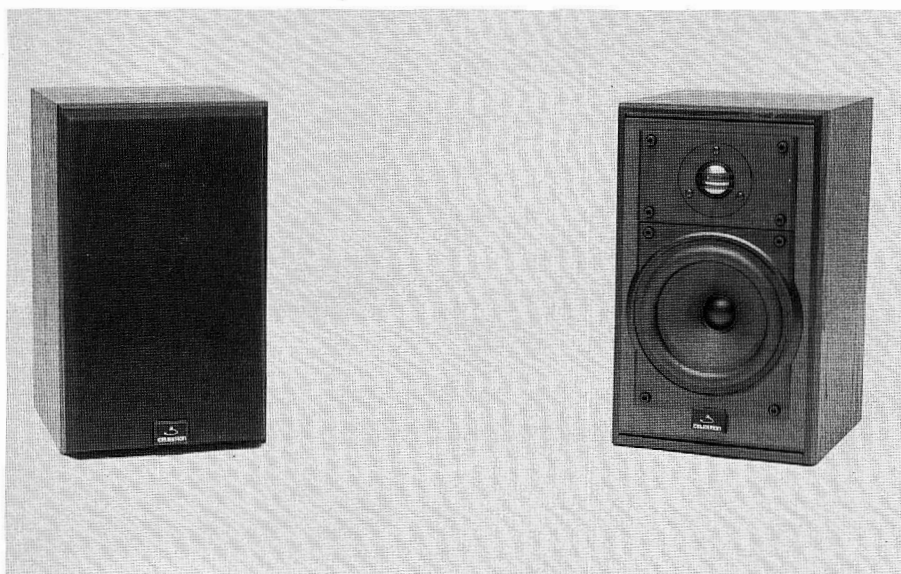
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Celestion is one of the oldest names in the business, and has been responsible for more than its fair share of innovation over the years. The company's *SL* series started the whole metal dome tweeter thing going a few years back, while also giving upmarket small loudspeakers a new respectability by using advanced honeycomb materials for the cabinetwork.

Just lately, however, they've been working very hard to keep up with demand for something quite different – the *Celestion 3*. This relative newcomer doesn't fit into the established *DL* and *SL* hierarchies, but is rather a one-off £109 'entry level' miniature. Although this is its first appearance in *Choice*, the *3* has already built up a sizeable popular following in the marketplace, not to mention a clutch of positive reviews in the hi-fi press.

For this sort of money, you don't get a great deal in the way of high tech embellishments, though there's a shiny and purposeful looking 25mm metal dome tweeter sitting beneath its own protective and phase-compensating grid. The cosmetics are very neat indeed, the grille itself being a cloth covered plastic moulded frame designed to minimise acoustic interference, and with clever key-and-slot retainers which avoid the need to inset those horrid little holes in the baffle proper. So if you decide to discard the grille, you get a very nicely presented front baffle, finished in a textured mid-grey and picture-framed by a chamfered woodgrain edge.

The drivers look as if they're built into chunky die-cast chassis', locked into place by tough machinehead screws. But this is window dressing: the baskets are plastic, and the machine heads disguise chipboard screws which bite straight into the 13mm baffle board. They were pretty well-tightened, but try going any further and a sort of splintering noise persuades you to stop pretty quickly, and the main driver's four screws are not well

placed to aid the overall mechanical integrity.

The sealed box is built from humble 13mm chipboard, its only treatment being to stuff it half full of wadding. The fairly simple crossover is hardwired and glued to the inside of the terminal block, with tagged connections to the drivers. The bass/mid unit uses an entirely untreated lightweight 100mm paper cone (with 10mm wide surround), which should at least ensure that it gets well up to the crossover frequency before running out of rise time. And you also get an attractive enough designer-badge, repeated on baffle and grille.

## TEST REPORT

This tiny box with an 'easy' impedance characteristic still manages sensitivity only just below average, and shows creditable bass extension to boot when adopting the intended wall siting. Power handling is inevitably restricted, but good levels will still be achieved with even modest amplification.

The downside is a significant 'lumpiness' through bass and midrange, around an overall trend which looks very well balanced, if a touch mid-forward. The grille modifies the response here and there, though not too seriously, while listeners should try to sit a little clear of the main axes for best results.

## SOUND QUALITY

Presented twice to the panel, these diminutive little boxes achieved a straight average rating on both occasions, which is a very positive result for a speaker at this price level.

The heart of this success is a wall-mount balance which is significantly more successful than most – one panelist actually referred to a good 3D image, which is a rare compliment for any wall-mount model. The net result still lacks 'muscle', 'weight' and authority through the bass, while the unevenness of what are basically low cost drivers

is reflected in a fair amount of coloration – there's some boxiness and a degree of artificial brightening. Removal of the grille does help.

Heavy pillar stands also provide some improvement, but the less costly open-frame types which are more likely to be used with a speaker such as this perform quite adequately. Ultimately, the *3* sounds a little over-polite: timing remains consistently good, but grip and dynamic drive are both in short supply, while the poise can become a little stressed when driven hard with top quality vinyl material.

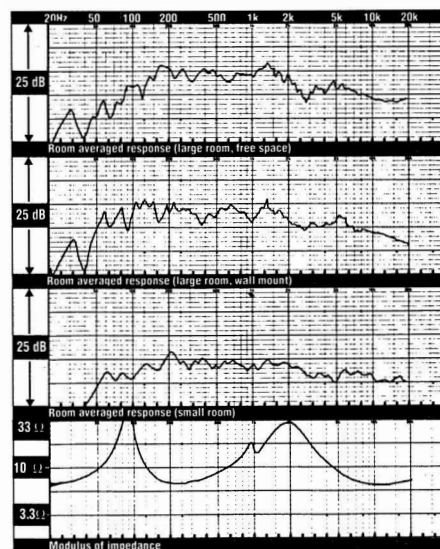
## CONCLUSIONS

The commercial success already achieved by the *Celestion 3* would appear to be well founded. Although the pseudo-engineering styling devices serve merely to disguise pretty mundane construction methods, it's an attractively finished and presented little box that produces an unusually well balanced result with more than respectable stereo imagery when placed close to a wall.

With a basic character which leans more towards inoffensiveness than excitement, and showing some favouritism towards CD, it's the sort of loudspeaker that should be tolerant of the limitations of similarly priced ancillaries, and clearly deserves confident Recommendation.

## TEST RESULTS

Size (height x width x depth)	31 x 18.5 x 21cm
Recommended amplifier power	15–50 watts
Recommended placement	high stands near rear wall
In room averaged response limits 50Hz–10kHz	± 4dB
Large room/space LF rolloff (–6dB ref midband)	60Hz
Large room/wall LF rolloff (–6dB ref midband)	52Hz
Small room LF rolloff (–6dB ref midband)	50Hz
Large room output at 20Hz (ref midband)	–19dB (est)
Estimated midrange sensitivity (ref 2.83v, 1m)	86dB
Impedance characteristic (ease of drive)	good
Forward response uniformity	very good
Typical price per pair (inc VAT)	£109



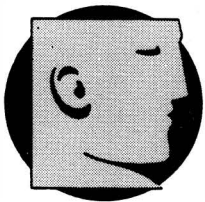
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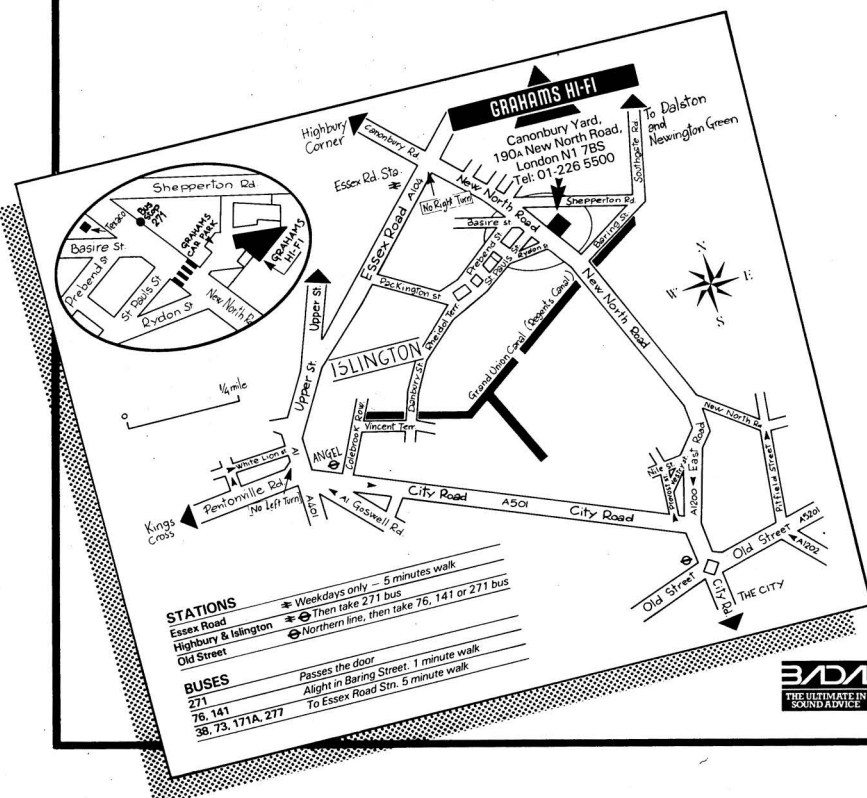
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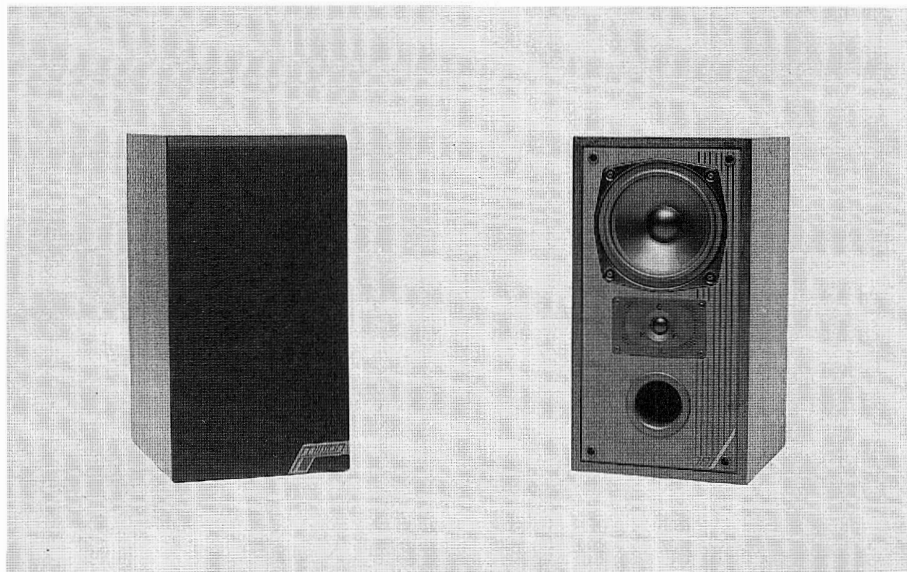
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# CYRUS 781

MISSION ELECTRONICS, STONEHILL, HUNTINGDON, CAMBS PE18 6ED. TEL: (0480) 52777.



After more than a decade of rapid growth, Mission is firmly established as a major player on the UK hi-fi scene, to the point where it is developing loudspeakers which are targetted towards specific market niches. Whereas the 76-series comprises an extensive range of loudspeakers built with highly cost effective techniques to meet the major price points operating in the mainstream market, *Cyrus*-branded 78-series models are consciously more upmarket and stylish.

The *Cyrus* brand is best known for amplifiers – delightful little things that have justly built up a cult following amongst cognoscenti. But the *Cyrus* concept involves covering, and hence having control over, the whole range, from a CD player or tuner source through to the two pairs of loudspeakers and their matching stands at the end of the chain. We're not attempting to assess the whole chain here, but did use the smart crackle-finish tripod stands which were supplied.

This is the second of the two *Cyrus* speakers to come to *Choice*, the larger and more expensive 782 featuring in June '89. This 781 resembles its big brother quite closely, but is £100 cheaper at £240, and uses a more conventional two-way driver configuration.

Veneered in real wood, and with a pretty, modern looking baffle when the grille is removed, the carcass of the 781 is built up in solid 18mm MDF. The drivers are properly rebated, and the tweeter was very strongly secured, while the main bass/mid basket is held by bolts under tension. Both are rebated, aiding appearance as well as acoustic performance. The grille is an innocuous looking plastic frame affair, of little aesthetic merit, but little acoustic demerit.

## TEST REPORT

This *Cyrus* combines above average sensitivity with a reasonably benign impedance and

good bass extension for the cabinet volume. The in-room traces show a fair amount of unevenness, and a balance which is probably useable against or away from the wall (if less than ideal in either site). The 'halfway house' in the smaller room in fact gives the best overall result.

The measurements suggest that the speaker has some difficulty in maintaining full output and phase coherence around the crossover region (4kHz), and the balance is best with the main axis at ear height, about 30 per cent off horizontally – the veritable apex of the equilateral.

## SOUND QUALITY

The 781 proved rather inconsistent in the listening tests. Initial results, auditioned on its own stands, were disappointing, but a later presentation, using the (much more expensive) 'standard' stands was much more positive. Indeed, the Operator's notes at the first presentation commented that it needed a solid/heavy stand to help control the bottom end.

This highlights one of the major dilemmas of loudspeaker reviewing: are we assessing the loudspeaker itself, or only its interaction with a given set of ancillaries? Certainly these interactions can make the difference between the success or failure of any model with pretensions to superior quality.

Attempting to extract the kernel beneath these variations, it is clear that the 781 is capable of providing a well balanced and spacious soundstage by wall-mount standards, along with impressive scale and weight – provided great care is taken in getting the set-up right. It is also fussy in the way it responds to different programme sources – there was a clear preference for CD over vinyl in our tests. Quite useable in free space, a near-wall site is nevertheless preferred.

Even under our 'best' conditions there was still some 'thick' and 'heavy' effects, the 'rich'

balance verging on the ponderous at times, all of which suggests the bass end is struggling to stay under control. The 781 nevertheless delivers a sweet, smooth, slightly 'laid back' sound with good stereo focus. It always sounds inviting, if not particularly involving or dynamic.

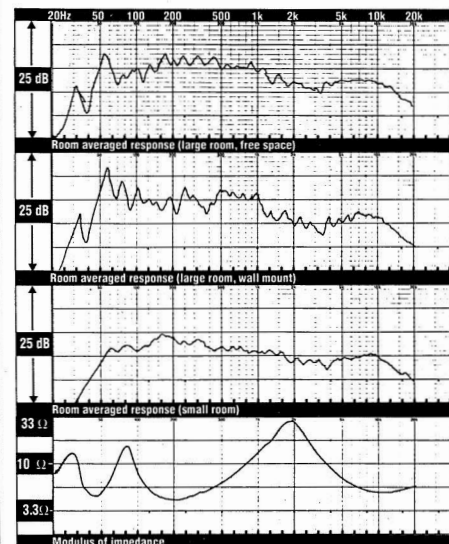
## CONCLUSIONS

Simply on the basis of its superb build, finish, presentation and engineering content, this *Cyrus* is obviously good value for money. Clearly better balanced (as well as cheaper) than the twin-driver 782, it comes within a whisker of recommendation, falling short through reservations about the bass quality under our test conditions.

Further experimentation with ancillaries such as cables and amplifiers, not to mention the room itself could well tip the balance, so the 781 is well worth serious consideration, preferably under home dem conditions – and especially at the end of an integrated *Cyrus* system. The romantic – almost rose-tinted – flavour imparted to the sound is especially likely to appeal to CD users.

## TEST RESULTS

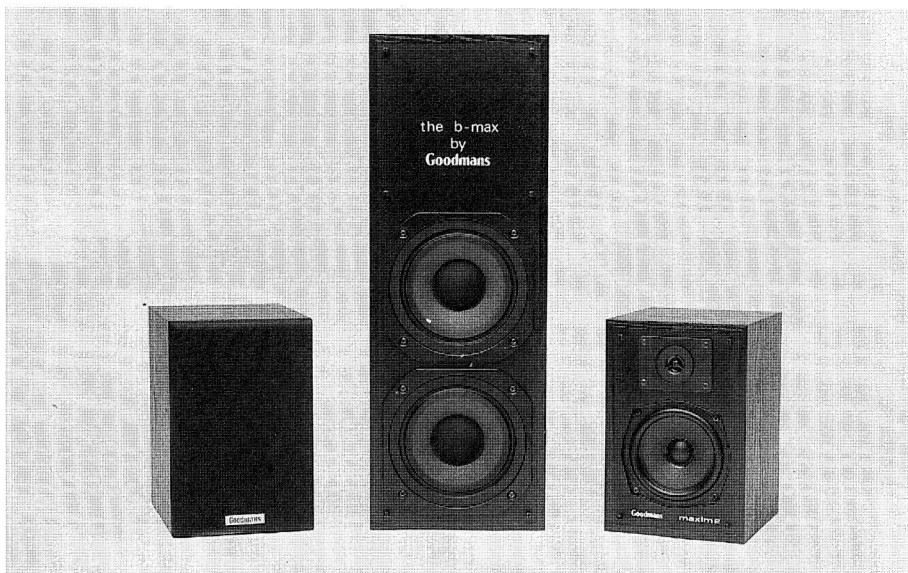
Size (height x width x depth)	43 x 22.5 x 28cm
Recommended amplifier power	15–100 watts
Recommended placement	on med stands near wall
In room averaged response limits 50Hz–10kHz	± 5dB
Large room/space LF rolloff (– 6dB ref midband)	35Hz
Large room/wall LF rolloff (– 6dB ref midband)	35Hz
Small room LF rolloff (– 6dB ref midband)	48Hz
Large room output at 20Hz (ref midband)	– 17dB
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	good
Forward response uniformity	fairly good
Typical price per pair (inc VAT)	£240





# GOODMANS B-MAX/MAXIM 2

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



We originally hoped to get in one (or more) of Goodmans' five new *M*-series mainstream models, first introduced at the Penta Show. But Goodmans' production schedule missed ours by a matter of weeks, so we've taken the opportunity to look at a new variation on a familiar theme – the *B-Max* subwoofered *Maxim 2*.

The *Maxim 2* has been the real success amongst Goodmans' recent hi-fi activity. It's not only one of the best of the miniatures around at the moment, it's also one of the cheapest too. In fact this real little sweetie gained a *Choice* Best Buy rating immediately on launch – and defended this status most ably amongst two handfuls of rivals only six months ago.

Although many buy miniatures because they're small, just as many choose them because they're cheap. Their size may be regarded as a key convenience factor, or a major handicap in the welly stakes, depending on your point of view. Mindful of the latter, Goodmans has come up with a subwoofer system dubbed *B-Max*, priced at a similar £90 as the *Maxim 2* itself, and designed to add a generous dollop of extra bass extension, welly and power handling.

The subwoofer concept involves putting the bass bits all together in a single larger box which may be tucked away from obvious view, leaving a properly placed small satellite pair to carry the stereo information. To meet a price which is unusually low by subwoofer standards (compare the new B&W and KEF designs, at £189 and £239 respectively), *B-Max* has had maximum manufacturing cost effectiveness firmly in mind. It therefore consists of a single reflex-loaded enclosure containing two identical bass drivers – one for each channel. Then there's the (heavy-weight) crossover and (eight-way) terminal block for linking the system up. (You bring your stereo signal in on one set of four, and use the other set to feed on to the satellites.)

I did in fact take a listen to an early sample a year or so back in my *Personal Messages* column, and wasn't terribly enamoured of the results. But *B-Max* has since been blessed by extra crossover circuitry to roll off the upper end of its passband, and so try to avoid the production of unwanted midrange output that interferes with the sound and especially stereo of the satellites. That at any rate is the theory...

## TEST REPORT

On its own, the *Maxim 2* delivers a pretty respectable in-room tonal balance – a little forward 200Hz-1.5kHz when mounted away from walls, but giving useful extension down to 75Hz with a little help from a nearby wall. Had the *B-Max* confined its activities to providing output below 200Hz, things might have worked out better. The problem is that it is still pumping merrily away at 400Hz, which those of a musical persuasion will more readily recognise as nearly an octave above middle C.

Compounding the felony, *B-Max* also fails to recognise that a subwoofer's true role in life is to do something about the octave and a bit below 50Hz – indeed, it probably needs to start rolling off its HF round about 50Hz so as to avoid both midrange interference and any unpleasant side effects of a sharp roll-off rate. The *B-Max* bandpass is concentrated on the three octaves 50-400Hz, which is by no means an ideal subwoofer working range.

Measuring the set-up is made difficult by the unpredictable phase cancellations that are created with a three-box system. What is very clear, however, is that *B-Max* offers less advantage than disadvantage in almost every respect. The *Maxim* alone can certainly benefit from the extra 6-10dB or so provided below 100Hz, but much of the same continuing on up to 300Hz only unbalances the whole caboodle. Even the promise of improved power handling is snatched away

by an impedance characteristic which my Naim *NAP250* flatly refused to drive for more than a few seconds at high level. And a *NAP250* is amongst the more load tolerant of amplifier designs...

## SOUND QUALITY

In view of the above, it's hardly surprising that the listeners' responses were generally unenthusiastic, though it's also true to say that a three-box system like this is bound to encounter some placement uncertainties with blind presentation.

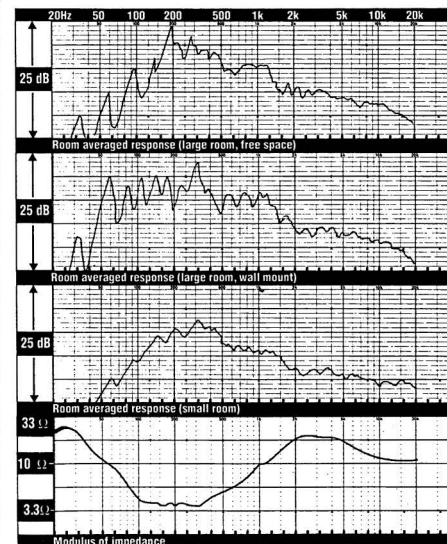
Certainly the combo sounded quite big and powerful, but the quality of the bass drew forth a range of expletives referring to its resonant and overblown nature. Following the comment "excessive general resonances", an experienced designer added parenthetically "I made one of these as a student back in 1967", and the term 'old fashioned' cropped up several times.

## CONCLUSIONS

Stick with the *Maxims* on their own until you can afford some real grown up loudspeakers.

## TEST RESULTS

Size (height x width x depth)	60 x 21 x 26cm + 2x (26 x 17 x 20cm)
Recommended amplifier power	15-100 watts
Recommended placement	experiment necessary
In room averaged response limits 50Hz-10kHz	±7dB
Large room/space LF rolloff (-6dB ref midband)	70Hz
Large room/wall LF rolloff (-6dB ref midband)	45Hz
Small room LF rolloff (-6dB ref midband)	80Hz
Large room output at 20Hz (ref midband)	-30dB (est)
Estimated midrange sensitivity (ref 2.83v, 1m)	89dB
Impedance characteristic (ease of drive)	poor
Forward response uniformity	good uniformity, poor response
Typical price per pair (inc VAT)	£90 + £90



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a tuner. The STG560 features rotary encode tuning, 39 channel random access presets, autoscan and auto memory. In fact it's so good, it even makes Radio 1 sound wonderful.

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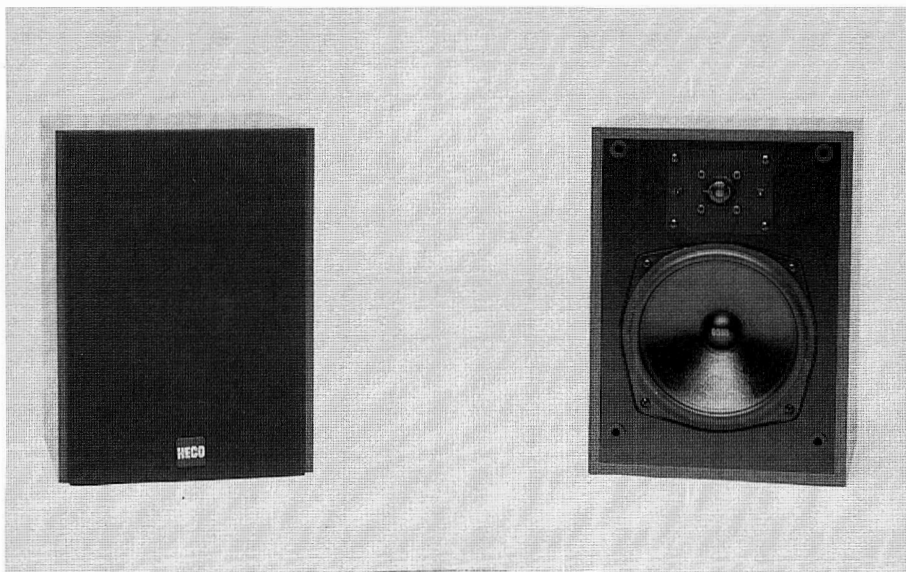
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# HECO INTERIOR 120S

ZENONLEC, FOURBURY HOUSE, 36 VICTORIA ROAD, MORTIMER, NR. READING RG7 36G. TEL: (0734) 333636.



West German manufacturer Heco started out in raw drivers, and for a time was part of the British Rank Organisation, but has since grown into one of several major brands which have been successful on their home market, and are now expanding into overseas territories, aided in this case by a 50 per cent stake in importer Zenonlec.

Heco has two distinct ranges of products, *Interiors* and *Superiors*. The £149 *120S* is in fact the third *Interior* to come *Choice's* way, and is one step (and £20) up from the miniature *90S* covered in August '89. This is the budget range, with vinyl covered or painted boxes, and little in the way of luxury embellishments. It's all a bit hair-shirt, appearance-wise, but keeps the price pretty competitive – though it's only fair to point out that the bigger UK manufacturers often offer a similar size cabinet at a rather lower cost.

The *120S* is a classic two-way 'medium bookshelf' model, available in no fewer than six different colour finishes, grilles and all, but was supplied to us in a rather uninteresting vinyl 'wood'. Colour schemes apart, I feel honour bound to note that I find it difficult to imagine a more boring looking loudspeaker, with or without the grille in place. In fact the grille should surely be consigned to the dustbin, for it merely interrupts an otherwise smooth baffle – rebated drivers and all – with its blunt 14mm frame edge.

The box is built up from pretty standard 16mm chipboard throughout, leaving little purchase for the driver mounting screws after the frame depth is routed out, though rawl plug inserts should at least ensure that over-tightening won't tear the wood to bits. The drivers were screwed in tight, but not that tight...

Though neat enough in their way, the drivers themselves look a shade old-fashioned, the bass/mid unit has a small magnet, pressed steel frame and a shallow, straight-sided, lightly doped 140mm paper cone –

giving approximately twice the diaphragm area of the *90S* – while the tweeter is the same 19mm metal dome unit. A fairly straightforward PCB crossover with commercial grade components is mounted inside the rear panel. In all, it's pretty basic stuff, in line with the *Interior* philosophy.

## TEST REPORT

Respectable power handling and above average sensitivity should ensure good loudness capability, though the load requires an amplifier capable of generous current delivery to cope with the low impedance either side of 200Hz. The traces show quite a wide variation with and without grille, suggesting that nakedness is likely to be the best policy.

The overall in-room balances look rather good, which seems to be something of a Heco accomplishment. It obviously favours some wall assistance, and offers a useful amount of extra low frequency output over the smaller *90S* – not in absolute extension, but by reinforcing the 50-200Hz range by several dB.

There's good consistency in the traces taken from different microphone positions, but all reflect a distinctly 'lumpy' character through much of the range, plus a slightly 'exposed' tweeter, which is some 2dB stronger relative to the midband here than those in either *90S* or *740*. The flattest balance is obtained on the vertical axis but 30 per cent off the horizontal – the triangle apex, forsooth.

## SOUND QUALITY

The good room balance ensured that the *120S* scored a respectable close-to-average rating in the listening tests, which is good for a fairly modestly priced model. It's quite tuneful and 'boppy', with a good sense of timing, if lacking any real pretensions to full range dynamics and weight.

For all that, it's a pretty gutsy performer that at least tries hard, even though it can

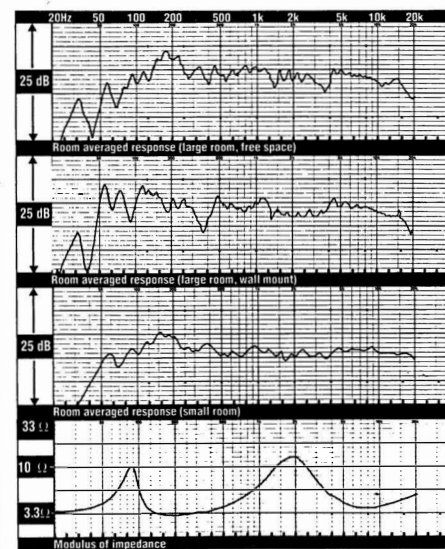
get a little out of its depth on more complex material, due to a degree of mid-bass congestion. Indeed, the only serious criticism was of the determinedly bright balance – albeit reassuringly non-specific and resonant – that received consistent panel comment, and which became still more obtrusive when the speaker was pulled clear from wall reinforcement.

## CONCLUSIONS

Once again Heco has shown it can create a competitive package which delivers a fine subjective balance in a real listening room, though on this occasion the tweeter output is just a little too strong for UK tastes (as represented in this instance by yrs trly and listening panel). Such a criticism does not mean the *120S* is not a viable performer – indeed in many respects it has much to offer, with an engaging liveliness, albeit in rather drab garb – but it does highlight an aspect of the performance which any prospective purchaser would do well to bear in mind when choosing a balance to taste, system and room.

## TEST RESULTS

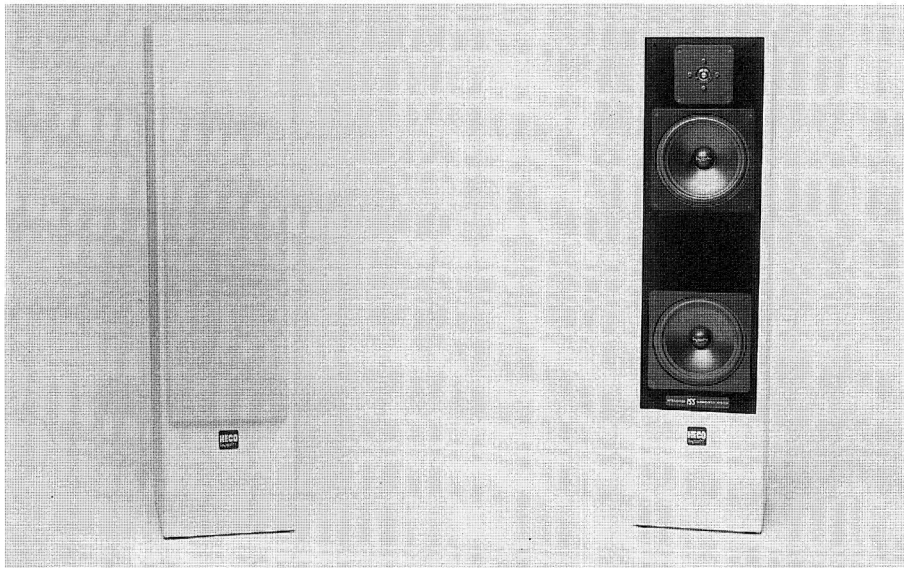
Size (height x width x depth)	32 x 23 x 23cm
Recommended amplifier power	15–80 watts
Recommended placement	against wall on high stands
In room averaged response limits 50Hz–10kHz	±6dB
Large room/space LF rolloff (–6dB ref midband)	55Hz
Large room/wall LF rolloff (–6dB ref midband)	45Hz
Small room LF rolloff (–6dB ref midband)	52Hz
Large room output at 20Hz (ref midband)	–16dB
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	good
Typical price per pair (inc VAT)	£149





# HECO SUPERIOR 740

ZENONLEC, FOURBURY HOUSE, 36 VICTORIA ROAD, MORTIMER, NR. READING RG7 36G. TEL: (0734) 333636.



Heco is a West German brand that has been around for at least a generation – indeed, back in the 70s it shared Rank percentage with Wharfedale and Leak. In those days Heco was known exclusively for drive unit manufacture, but the intervening years since achieving independence has been devoted to building a strong domestic base in complete loudspeaker systems. Though only recently arrived in the UK, Heco's commitment to this highly competitive market is made clear by its part ownership of importer Zenonlec.

Previous experience, of two rather sombre and discreet 'Interiors' models left me ill-prepared for opening these cartons. Opening the linen(!) inner liner revealed a generously figured, high quality real wood veneer finished in a startling white stain. Though I doubt the photographer will agree as he wrestles with a 100 per cent albedo change, it's all rather gorgeous, and blends most attractively with my drawing-room decor (the 'smaller' test room). However, the instructions (and measurements) leave no doubt this is a speaker for a largish room that can leave plenty of space around the enclosures.

The grille cloth is also white, which is a bit of an invitation for dirty fingermarks. And I can't for the life of me see how the cloth can be removed for cleaning. Still, the frames don't look too promising from an acoustic perspective, so you'd probably do better to always leave them off entirely, revealing a contrasting black flock baffle with neatly mounted drivers and rather over-the-top graphics.

It's a tall but slim floorstanding enclosure that has a footprint smaller than most bookshelf models on stands. Each unit is really two speakers in one – a small two-way enclosure sitting on top of a separate chamber, though physically integrated 'subwoofer'. The central divide helps stiffen the cabinet, so the panels are no larger than a normal

bookshelf model. The main drivers have 120mm plastic cones and generous magnets. They're built on to square-frame die-cast baskets, and only secured by four little wood screws in the corners. The tweeter has a small 19mm metal dome, protected by a phase compensator grille.

There's no provision for spikes (yet, as far as I can ascertain, presumably in deference to the houseproud), so some performance compromise here is inevitable. Nor is there any provision for bi-wiring/-amping, though the terminals themselves are top quality items.

## TEST REPORT

Rated similar in sensitivity to its much smaller stablemate, and sharing the latter's Euro-style current-hungry impedance characteristic, the 740 nevertheless goes some way towards justifying both size and price with a genuinely extended bass response under normal room conditions.

The room response traces clearly favour free space siting in the larger test room, whereupon the overall balance is promisingly flat and extended. Whether you regard the 100Hz-1.2kHz region as forward or the presence band as recessed is a matter of perspective: the broad trend is smooth enough despite the odd step here and there.

The tweeter has the typical German 'hot little number' response on axis, but someone has done enough homework to optimise the overall balance on the vertical and slightly off the horizontal axes. The grille is probably best left off, especially if you've got dirty fingermarks on it already (see above).

## SOUND QUALITY

There's an impressive consistency in the Heco floorstanders, the findings for the 740 closely paralleling those obtained with the larger but less costly 530 six months ago. Certainly too heavy when located against the

wall, and probably too rich for use in smaller rooms, the bass nevertheless sounds usefully extended, if rather lacking in 'bite'.

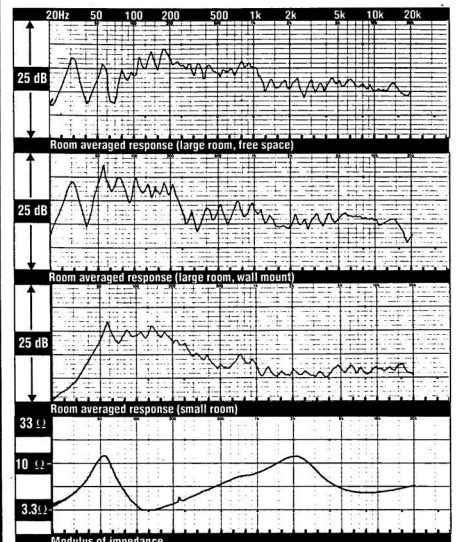
Bar a slight overemphasis of very high frequencies, the subjective balance is as neutral as any, delivering very pleasing 'air', openness and clarity. But it's also a little bit too warm and a little bit too polite to appeal to all tastes; the attention has a habit of wandering away from the music, rather than being drawn into the action. Frequently very satisfying on spoken word or classical material, it is less fluent in the language of rock music.

## CONCLUSIONS

It's difficult to make value for money judgement on the *Superior 740*, partly because it doesn't seem to offer all that much more performance than the *Interior 530*, yet costs £200 more. But it does look a whole lot nicer, and I still covet a pair for the drawing-room, even if it isn't the most exciting sounding speaker around, and is in dire need of a spiking kit. It's a little too bland to appeal to the hi-fi enthusiast, but is well worth considering by the more casual user who is seeking – and prepared to pay a premium for – the superior aesthetics, and who wants something undemanding and easy to live with.

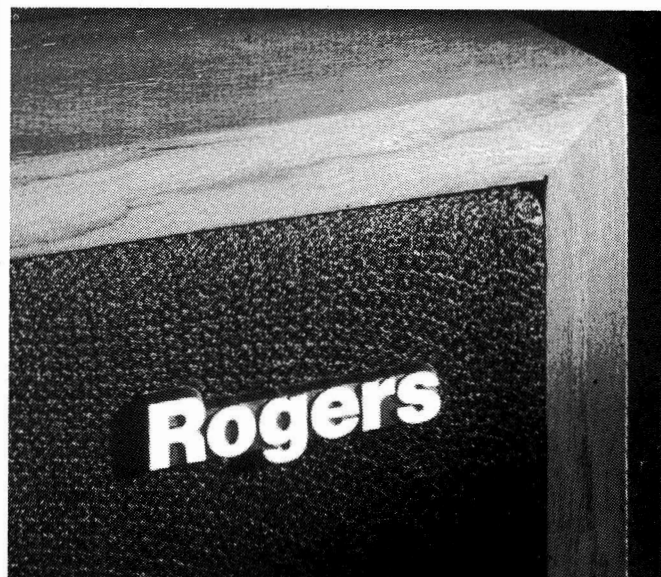
## TEST RESULTS

Size (height x width x depth)	84.5 x 22 x 25cm
Recommended amplifier power	15–150 watts
Recommended placement	on floor in free space
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
Small room LF rolloff (–6dB ref midband)	40Hz
Large room output at 20Hz (ref midband)	–9dB
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	very good
Typical price per pair (inc VAT)	£599



T H E N A T U R A L C H O I C E

**Rogers**



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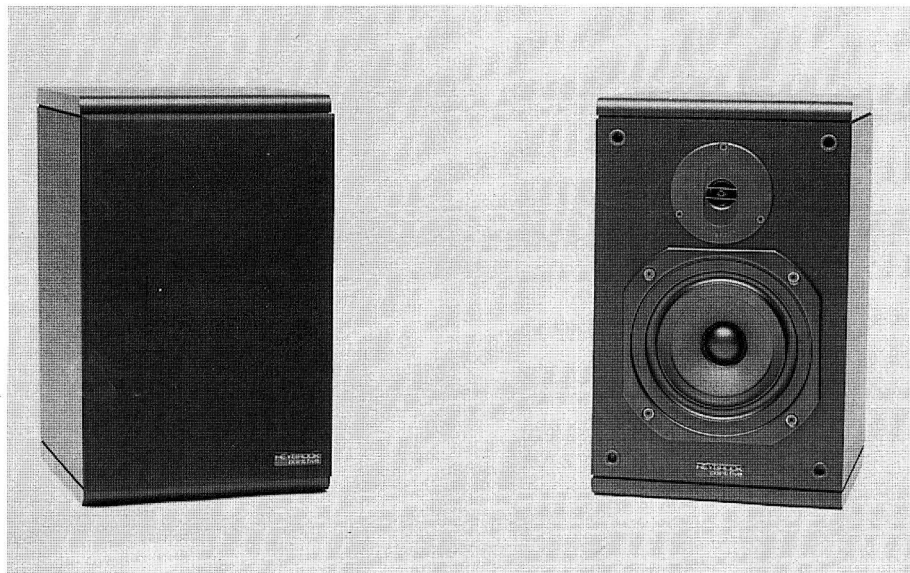
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# HEYBROOK POINT 5

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



Heybrook is a UK manufacturer from the West Country, with a number of trendsetting loudspeakers – and stands – to its credit. Besides a justified obsession with getting to grips with the important influence a stand makes upon the performance of a loudspeaker system, Heybrook has always designed models for the convenience of wall-siting, and that is the case with this £139 'baby' in the range – the *Point 5*.

*Choice* originally assessed this popular and successful model a year or two back, with rather mixed results that may have had something to do with the samples concerned. Since nothing stays exactly the same in loudspeaker manufacture, and since it remains a key model in a deservedly popular and widely available range, a full reappraisal seems well worthwhile.

It's a classic medium sized, sealed-box two-way bookshelf model, competitively priced and attractively (albeit sombrelly) presented, with or without grille in place. The cabinet is unusual in both construction and presentation. The 'wrap' comprises back, sides and baffle, and this is stiffened by nicely shaped insert top and bottom panels. The textured finish emphasises the contemporary styling, as do the matching open frame stands which are also available.

This sort of price doesn't buy much in the way of quality engineering, but I was a shade disappointed to find the drivers secured by three and four narrow gauge, coarse pitch wood screws. They were done up pretty tightly, and brass washers add some tensioning, but there's really no such thing as tight with this arrangement, and then the splintering starts. The box itself is constructed from 15mm chipboard, which is par for the course, boosted by 25mm MDF for top and base, and is carefully stuffed with what is clearly a specifically chosen cocktail of wadding.

A minimalist crossover is hardwired and glued to the inside of the terminal block,

feeding the drivers via spaced, quite fine gauge solid-core cable. The main bass/mid driver has a small (110mm) undamped paper cone plus a quite wide surround, mounted in a rather occludent pressed steel frame and small magnet; that on the tweeter is even smaller, while its diaphragm shape or material is difficult to make out 'neath a short horn flare and phase compensators.

## TEST REPORT

The 85dB sensitivity rating looks a little uninspiring, until you take into account that it could have achieved 88 if the impedance hadn't been kept safely high – and that the bass extension is really rather good considering the overall box size.

This is clearly a wall-mount design, and shows one of the better attempts to align the balance to give a smoothish total result in this position. There's a degree of unevenness, to be sure, but it's less than most in a similar situation. The tweeter looks a shade unruly here and there, but the axial responses show that the *Point 5* is impressively uncritical along the vertical axis, and is best at 30 per cent off the horizontal axis, which is precisely what the designer intended. Put them square on and back against the wall, and sit on the apex of the triangle. The bass-to-mid balance is particularly good in the smaller test room, though the treble doesn't integrate quite as cleanly here. The grille doesn't have an enormous effect, but is probably best left off nonetheless.

## SOUND QUALITY

Although one listener consistently disliked the *Point 5*, the remainder were sufficiently forgiving of its shortcomings and enthusiastic about its strengths to provide a rating only a shade below average, which is respectable enough for such a compact low cost model. The wall-mount balance clearly works well subjectively, though the balance remains

determinedly 'dry' and a little 'forward', and there's little stereo depth.

Combining equally obvious strengths and weaknesses, one panelist wrote a summary paragraph which seems very accurate, so I shall quote in full: "Not especially ambitious, but musically enjoyable nonetheless. A little uncouth in the treble, and with no real bass to speak of, this speaker is still quite satisfying because it is vivid, fast and tuneful."

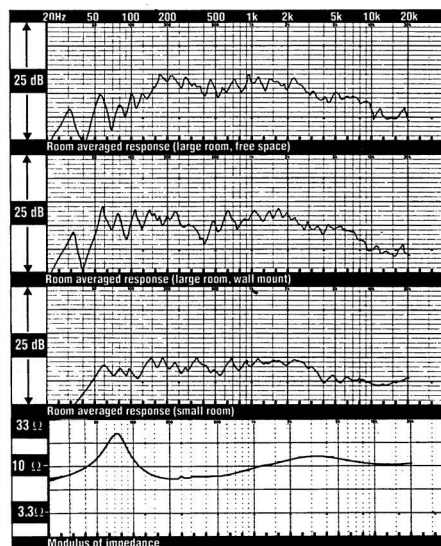
To which I might add, there is also a degree of mid 'boxiness' which some other listeners found distracting. But the fundamental rhythmic and dynamic integrity through the mid and upper bass sets it well ahead of most competitors in an area which is likely to benefit rock music more than classical.

## CONCLUSIONS

The *Point 5* remains a difficult model to evaluate. Like the man said, it's both uncouth and yet still satisfying, so any commendation must remain burdened by caveats about trying it for yourself etc. But it is pretty, and it's pretty cheap as well, so unless you're heavily into three-dimensional stereo soundstages and don't give a fig for rhythm or blues, I suggest you give it a hearing.

## TEST RESULTS

Size (height x width x depth)	37.5 x 23 x 24cm
Recommended amplifier power	20–80 watts
Recommended placement	high stands against wall
In room averaged response limits 50Hz–10kHz	±4dB
Large room/space LF rolloff (–6dB ref midband)	32Hz
Large room/wall LF rolloff (–6dB ref midband)	30Hz
Small room LF rolloff (–6dB ref midband)	35Hz
Large room output at 20Hz (ref midband)	–13dB
Estimated midrange sensitivity (ref 2.83v, 1m)	85dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	fairly good
Typical price per pair (inc VAT)	£139



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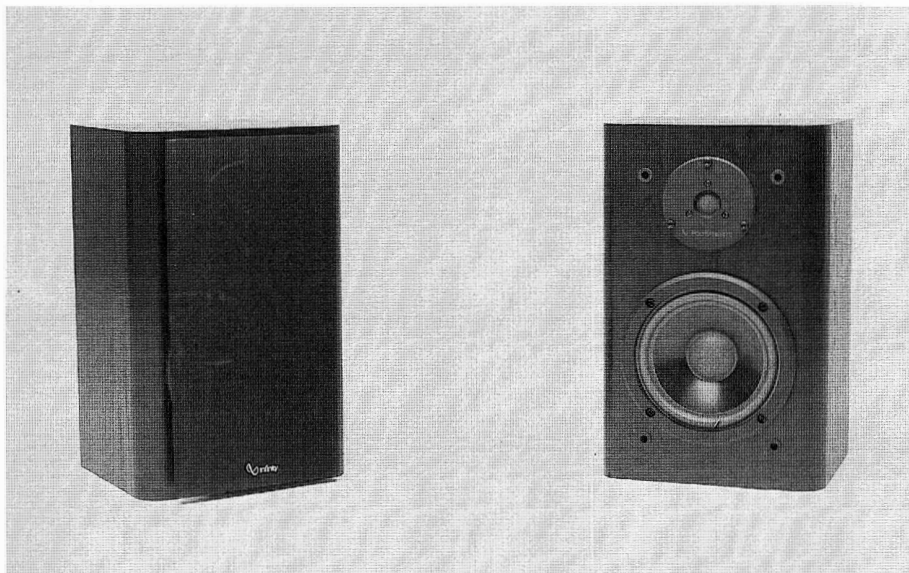
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ELECTROACTIVITY

# INFINITY RS2001

GAMEPATH LTD., 25 HEATHFIELD, STACEY BUSHES, MILTON KEYNES MK12 6HR. TEL: (0908) 317707.

RECOMMENDED



Infinity has long been one of the major moving forces in US hi-fi, known first and foremost perhaps for the devastating size and price of its flagship models down the years, but actually selling large numbers of more sensibly priced models, many of which are distinguished by unusual appearance or drive unit technology.

UK distribution is via Gamepath Ltd (the company behind the well-known Rotel Hi-Fi brand), partly to reinforce that company's longterm strategy to move upmarket in esoteric hi-fi, but also in this case to supplement Rotel's own fine amplifiers (and compete with its British built loudspeakers).

The RS2001 is successor to the 2000, one of our Best Buys of 1988 (June, if you want to look it up). While I note that the tweeter is now labelled 'polyspherite' instead of 'poly-cell' (presumably referring to the self-evident fact that a spherite is a much sexier object than a common or garden cell), Alvin's general description would still serve pretty well for this version complete with the unusual use of foam in the driver diaphragms. Oh yes, the transparent cone has now been rendered black and opaque, perhaps through the addition of mineral loading.

It's a simple enough sealed box, though the vertical baffle edges have received generous radius post-forming – a traditional Infinity technique which helps minimise the acoustic 'focusing' and reflection effect of a square-edged baffle. The grille looks a bit daft stuck out on little stalks, but its moulded frame has a small acoustic profile which should do little harm. Underneath, it is pretty enough, if a shade bland and black.

Hunky machine-head screws promise macho engineering, but fail to deliver when attacked by an Allen key of appropriate size. The drivers are not particularly well tightened, and I stopped quickly on hearing a splintering noise from one of the tweeter

bolts. In fact the baffle and sides are a pretty decent grade of board, albeit only 16mm thick, and much of the problem lies with the nasty narrow and coarse-pitch screw shafts. The box is well stuffed with wadding, and a reasonably simply PCB crossover is mounted inside the terminal block, with generous gauge wire tagged to the drivers. The magnet on the bass/mid unit also lets down the macho appeal a bit (which is maybe why you can't now see through the 120mm plastic cone?).

## TEST REPORT

Average sensitivity combined with a lowish, current hungry impedance ought to be the recipe for good bass extension. Such is indeed the case here, but it's not that good, all things considered, especially in the light of the rather rich and heavy upper bass output.

This is one of those designs which should be fairly tolerant of siting, delivering a reasonably well balanced result with or without wall reinforcement. But it also has a distinctly uneven response, both in the overall 'three-humped' trend and in the fine detail en route.

The grille is in fact probably better discarded, since it modifies output in several regions. Lateral distribution is consistently good, but below axis listening is clearly to be avoided – if you want to mount them up high, try turning them upside down!

## SOUND QUALITY

I can't get any great consistency out of the panel's comments on this occasion, though the consensus (and subsequent listening) favours wall siting, with even some good words for the stereo performance here. The uneven mid balance and attendant coloration clearly upset some listeners more than others, while later experiments suggest that the bass is not best served on heavy stands.

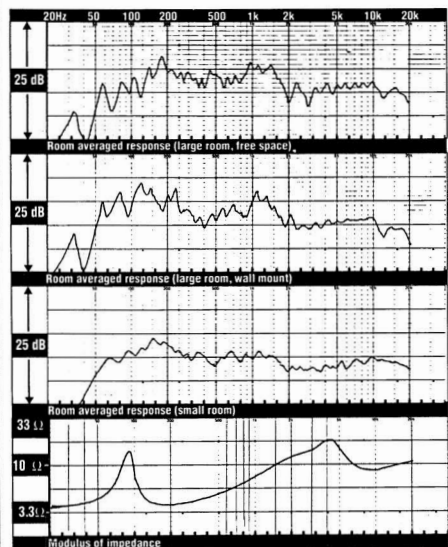
Indeed, these later tests conducted with light, open frame stands do rather more than just suggest that it's worth much more than the slightly desultory, a-bit-below-average panel rating. For my money it has an engaging bouncy and dynamic quality that goes a long way towards compensating for a little sonic rudeness along the way. Politeness is not a forte, and a degree of over-brightness comes as part of the package, but clarity, detail and dynamics are all well in its favour.

## CONCLUSIONS

This model's predecessor was a resounding *Choice* success, so the blind listening test findings here were something of a disappointment. Although hampered by some coloration and an unruly treble, the 2001 nevertheless remains a redoubtable little performer, with fine dynamics, a lively sense of pace, and a good wall-site in-room balance. As such, continued Recommendation is entirely appropriate, but general unevenness and silly cosmetic pseudo-engineering, coupled with a 25+ per cent price increase since the model of 18 months ago must mitigate against continued Best Buy status.

## TEST RESULTS

Size (height x width x depth)	36.5 x 22.5 x 20cm
Recommended amplifier power	20–70 watts
Recommended placement	lightweight stands, uncritical site
In room averaged response limits 50Hz–10kHz	±6dB
Large room/space LF rolloff (–6dB ref midband)	52Hz
Large room/wall LF rolloff (–6dB ref midband)	48Hz
Small room LF rolloff (–6dB ref midband)	48Hz
Large room output at 20Hz (ref midband)	–16dB
Estimated midrange sensitivity (ref 2.83v, 1m)	87dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	fair
Typical price per pair (inc VAT)	£169



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- ▽ Choose a specialist shop (good hi-fi shops don't usually sell cookers).



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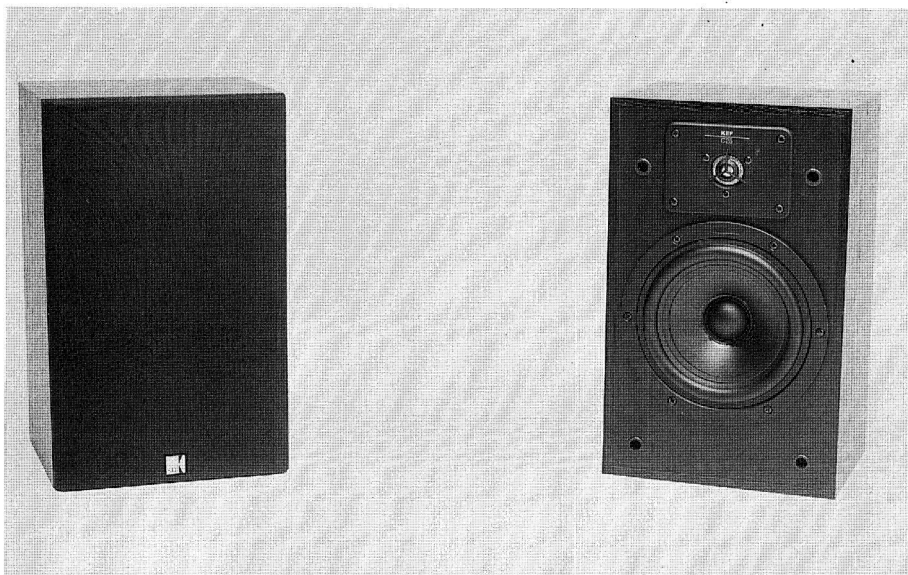
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# KEF C25

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KEF is the (British) company that has arguably made the greatest contribution to loudspeaker and acoustic engineering over the past decades, and is also one of comparatively few to engage seriously in fundamental research. The company's domestic hi-fi products fall into two groups: the upmarket *Reference* series, full of real wood veneers, computer matched tolerancing and high tech embellishments, and then there's the *Cs*.

I won't get any thanks for calling these the Cheap range – the *C* originated in *Corellis*, *Concertos*, *Cantatas* and so on, back in days when the musical dictionary took precedence over a mere cypher. But the *Cs* are certainly less expensive than the *Reference* models, in terms of £s per cubic foot, kilogramme or whatever yardstick you care to name.

*Hi-Fi Choice* is still getting around to testing the new six-strong *C*-series, all introduced in Summer 1989. Last time around (June 89) we covered the diminutive *C15*, an unusually tiny yet very impressive performer, so now it's the turn of the much more mainstream £139 *C25* – a typical enough example of the classic small bookshelf two-way model that provides the bread and butter of most ranges.

That this is KEF's variation on the theme will certainly ensure some engineering credibility. But there are none of the high tech 'extras' which are KEF's speciality in this sort of package – no Uni-Q, coupled cavity or conjugate crossover. What you see is what you get – a two-way sealed box nicely finished in black woodgrain vinyl.

The enclosure is built up from solid enough 15mm chipboard, with the front and back recessed to stiffen the sides. It's well stuffed with wadding, and a fairly complex PCB crossover is mounted inside the back, just above the terminal block. Drivers have tag connection, using wire of decent thickness.

The bass unit has a 105mm plastic cone with 18mm surround in a cast alloy frame with six fixing points. However, the screws are rather flimsy, biting only into wood, and were not done up particularly tightly. The tweeter has what appears to be a metal dome, though the shape is maybe more of a minaret. A moulded phase compensator ring doubles as some sort of protection against the intrusion of small sticky fingers. The grille is clever, giving the appearance of a nice solid wooden frame while actually taking advantage of plastic injection moulding to create a very smooth chamfer surround to the drivers. Which is probably just as well, since the baffle looks rather undistinguished if left unclothed, despite the picture frame edges.

## TEST REPORT

This compact model just beats the average for sensitivity, but does so by sacrificing bass extension and by taking a few liberties with the impedance. The response is unusually smooth and well balanced through bass and midrange, with an LF alignment which looks capable of operating well enough both in free space or close to a wall.

However, the loss of net output through the crossover region and rather lumpy looking tweeter characteristics are rather less inspiring. Removal of the grille appears to smooth the response a little, while best results are obtained close to the axis vertically and about 30-40 per cent off the horizontal axis – just about right for those in the stereo seat with the speakers placed square with the room boundaries.

## SOUND QUALITY

Soft was the adjective that cropped up most frequently on practically all the listeners' notes, especially referring to the bass end of things, where 'soggy', 'jelly' and 'plodding' were amongst other less complimentary

words used to describe the *C25*.

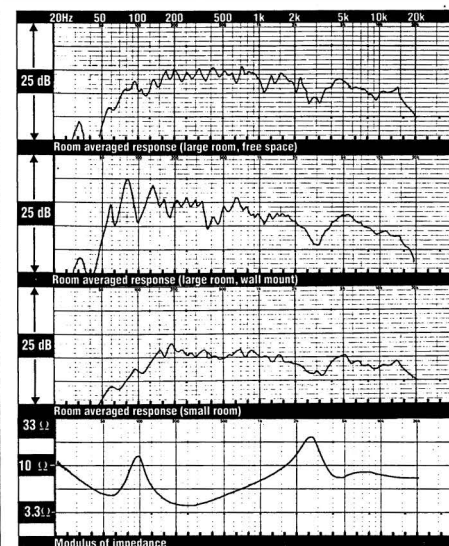
Back to the wall, this KEF tends to be a little too heavy and rich for comfort. The balance is a little happier in free space, though the lack of bass energy and power becomes rather more obvious here. Coloration is generally low, though the treble region is slightly 'exposed' above the laid back presence band. It's a loudspeaker that is unlikely to offend, save by its very inoffensiveness. This in turn adds a degree of blandness which is more appropriate to background listening than the much more demanding task of conveying musical excitement.

## CONCLUSIONS

Whereas the *C15* is an agile and nimble little performer that won the hearts of panelists and reviewer alike, the *C25* is an altogether less endearing proposition – very safe and competent, but rather short on inspiration. It's as if the design brief included the requirement of vice-free performance on the end of a music centre in Muskogee, and in so doing somehow missed out on the 'brio' beloved of the British enthusiast. Still, I'll bet it will go on performing reliably and faithfully for years . . .

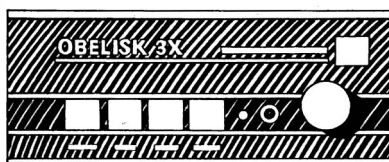
## TEST RESULTS

Size (height x width x depth)	34 x 20.5 x 17cm
Recommended amplifier power	15–60 watts
Recommended placement	high stands about 30cm from wall
In room averaged response limits 50Hz–10kHz	±5dB
Large room/space LF rolloff (–6dB ref midband)	65Hz
Large room/wall LF rolloff (–6dB ref midband)	55Hz
Small room LF rolloff (–6dB ref midband)	80Hz
Large room output at 20Hz (ref midband)	–25dB (est)
Estimated midrange sensitivity (ref 2.83v, 1m)	87dB
Impedance characteristic (ease of drive)	acceptable
Forward response uniformity	good
Typical price per pair (inc VAT)	£139



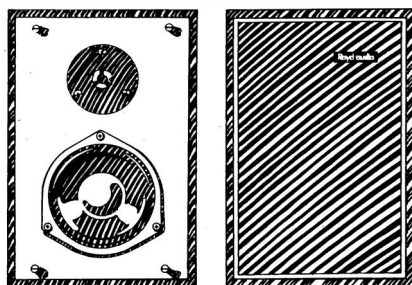
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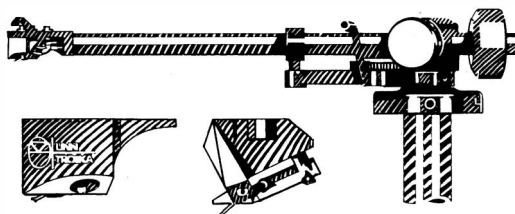


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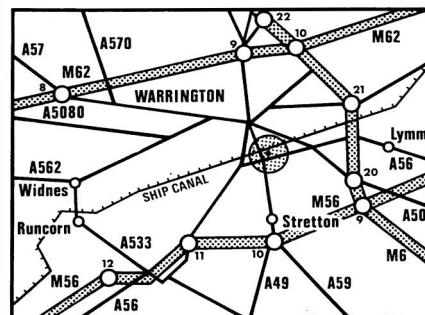


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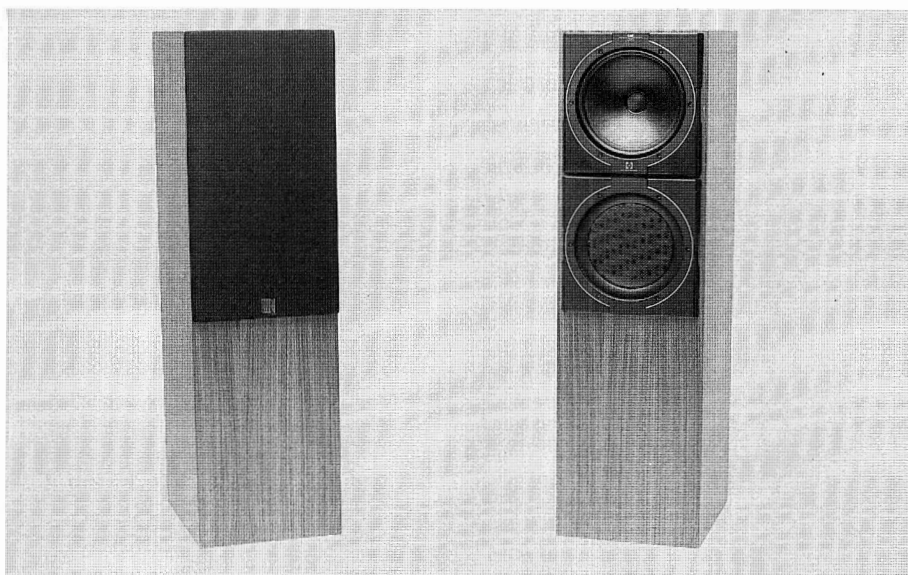
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# KEF C95

KEF ELECTRONICS LTD., TOVIL, MAIDSTONE, KENT ME15 6QP. TEL: (0622) 672261.

RECOMMENDED



When not busying themselves influencing the future direction of world loudspeaker engineering with high tech *R*-series flagships, KEF engineers get down to serious bean counting, putting together the competitively priced *C*-series models (*C* for Cost-effective, of course). There are six *C*s altogether, starting from the miniature *C15* and running up to the top model which is the subject of this review. The *95* actually weighs in at £599, is as imposing as the flagship models offered by a number of rivals, and uses a number of interesting engineering techniques.

A tallish floorstanding box, it shares one unique technical feature with the *C75* which was well liked last June – a *Uni-Q* main driver. This is not just one driver: *Uni-Q* is a dual concentric or coaxial unit which consists of a normal plastic cone driver for bass and mid duties, and then has a special miniature tweeter mounted on the pole piece in the middle of the main cone. Ample HF sensitivity is achieved through rare earth magnets, specifically a neodymium/iron/boron alloy. The real advantage of *Uni-Q* is that the effective acoustic centres of the bass/mid cone and HF dome may be made coincident at the crossover frequency, and this ensures a smooth and stable transition from one to the other irrespective of the measuring axis.

Below the *Uni-Q* driver is what looks like a second driver of some sort, metal grillework and trim actually disguising a large diameter port. In fact there is another driver, but it's mounted inside the box, communicating its entire output to the world at large via a 'coupled cavity'. This clever technique which was pioneered in *R104/2* combines the LF stability of a sealed box with the efficiency of a reflex, the cavity acting as an acoustic band-pass filter, and incidentally also enables the bass unit to be mounted with its axis perpendicular to the floor.

Yet another unusual technique borrowed

from the *R*-series is a conjugate load matched crossover, which presents a low but almost constant impedance load to the driving amplifier. The cabinet is built up from 19mm chipboard, finished in a real wood (if rather undistinguished) veneer. Internal panels provide the bass driver baffle and a partition for the *Uni-Q*'s own small well-damped sealed chamber, while also usefully stiffening everything up.

There are clever cosmetic and production details too. Square diecast driver frames look smart with the grille off (if you can get it off!), and integrate mechanically and acoustically with the grille frame for minimal performance compromise if it is retained. The driver is (not very tightly though there's tensioning in the frame) secured by six wood-screws, with tag wiring to a PCB crossover on the back of the magnet. Bi-wire/-amp connection is available, separating out the bass driver of the three.

## TEST REPORT

This large model combines excellent power handling with a sensitivity several dB above average, thanks in part to a resolutely low impedance characteristic which will demand plenty of amplifier current.

The responses show a smooth but rather rich overall character, especially in the smaller room. Bass extension is good by normal standards, though not exceptional considering the box size. In free space there is some mid dominance, though full wall reinforcement is likely to provide too much mid-bass weight.

The responses are unusually consistent and smooth throughout, though even *Uni-Q* technology has not entirely flattened the crossover integration. The off-axis traces show good lateral and vertical consistency, though below axis listening is perhaps better avoided (a pity since this is a tall loudspeaker).

## SOUND QUALITY

The *C95* was well liked by the listening panel on two separate occasions, attracting plenty of praise for its weight, extension, smoothness and low coloration, alongside some censure for a comparative shortfall in speed and dynamics, with a ponderousness at the bottom end that left several listeners unhappy.

Clearly needing to be kept clear of room boundaries, even here the sound is decidedly on the warm side of neutral, giving a rich and laid back balance that many will find easy to live with. As one panelist eloquently put it: "enjoyable in a log fire kinda way". Stereo is consistent and well defined, while aside from the richness, coloration is confined to a mild mid boxiness and a little treble 'shimmer'. Driver integration is clearly very good.

## CONCLUSIONS

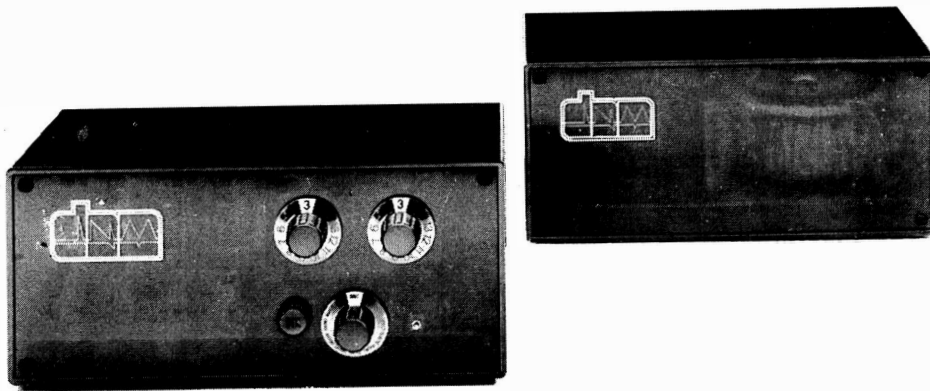
Even our quite large room was possibly not big enough to suit the *C95*'s overall balance, which certainly tends more towards mid-bass richness than low bass extension. While noting general reservations about an overall 'lazy' character, there's no denying the considerable virtues of a well engineered and presented package that combines good scale, weight and loudness capability with fine neutrality and control, at a reasonable enough price for clear recommendation.

## TEST RESULTS

Size (height x width x depth)	88.5 x 24.5 x 31cm
Recommended amplifier power	15–150 watts
Recommended placement	on floor in free space
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
Small room LF rolloff (–6dB ref midband)	35Hz
Large room output at 20Hz (ref midband)	–12dB
Estimated midrange sensitivity (ref 2.83v, 1m)	90dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	very good
Typical price per pair (inc VAT)	£599



# D N M



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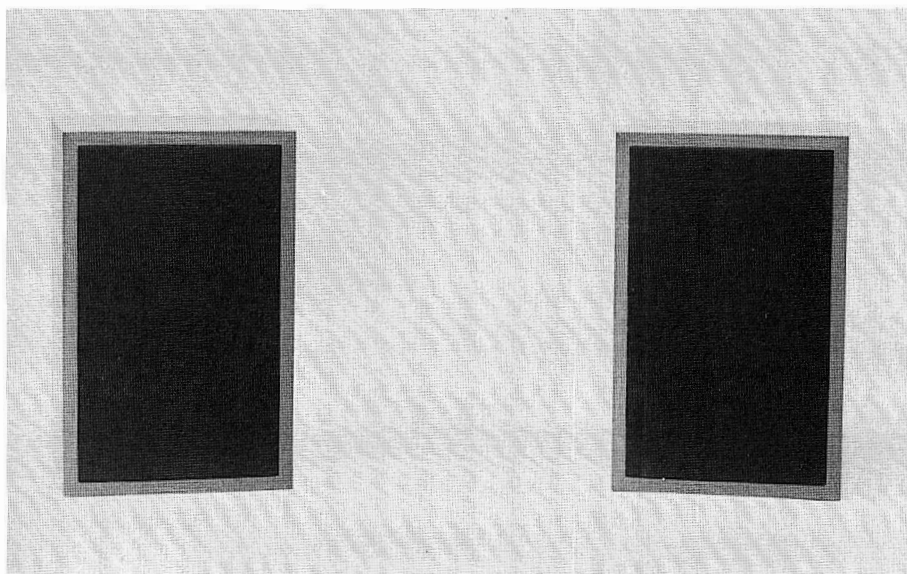
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# LINN KAN 2

LINN PRODUCTS LTD., FLOORS ROAD, WATERFOOT, EAGLESHAM, GLASGOW G76 0EP. TEL: 041 644 5111.



Linn's *Kan* has been on the market for longer than all but a handful of current models, though the redesign to formal *Mk2* status is fairly recent. The original *Kan* was very much a statement of Linn's design philosophy, while deliberately parodying the enclosure and price of the popular BBC *LS3/5A* design. The bizarre sonic contrast between two apparently identical boxes ensured the cleverly named *Kan* was always one of the most controversial designs around – a love-it-or-hate-it cult product in the real sense of the word.

The new *Kan* is visually identical to its predecessor apart from an extra pair of sockets for bi-wiring/-amping connections, but is reportedly a little tamer and more civilised than its rather wild (if, for some, wonderful) predecessor, following significant changes in the crossover network. There have been detail modifications to the baffle and unit mounting too, while the price is now up to £339 – a lot of money for any two-way miniature. Finish is real – and top quality – wood veneer in teak, walnut or black, with rosewood at extra cost.

It's a tiny little box, and unlike the *3/5A* it's designed for close-to-wall siting. Some tall matching open frame stands are an optional extra that have become one of the industry favourites for compact loudspeakers – justifiably so, as it turned out in our listening. The whole thing is very solidly built, causing minor bruising to those foolish enough to apply the knuckle test.

To my knowledge the drivers remain much as before, though both the KEF *B110* bass/mid and Hiqophon 19mm soft dome tweeter are well established enough to be tailored to suit a particular manufacturer's requirements.

## TEST REPORT

Sensitivity is well below average, partly thanks to a 'kind' (8ohm) impedance charac-

teristic, but also the efforts which are necessary to extract a modicum of bass extension out of a box into which I would have the greatest difficulty fitting one, let alone a pair of walking shoes. In point of fact, the bass developed in-room is quite comparable with larger and more sensitive models of a comparable price, leaving loudness capability as the price extracted for physical minimalism.

The room responses confirm how well the *Kan 2* has been aligned for its intended wall site, the response here being (unusually) smoother than that obtained in free space, if not entirely smooth for all that. Best balance is obtained at or below the main forward axis, so the high stands supplied are a very good match. The responses never look exactly tidy, but the broad overall balance is close to target, while the sound will probably take on character from the 500Hz-1.2kHz plateau and 5kHz prominence.

## SOUND QUALITY

The black curtain is a great leveller that is not kind to would-be giant-killers like the *Kan*, robbing listeners of the stimulus that all too easily leads to psychological overcompensation for the size of the enclosure (as the BBC showed many years ago). The *Kan* didn't disgrace itself, but neither was it particularly well liked, the lack of size betraying itself all too clearly in a lack of genuine 'weight' and 'scale'. Furthermore, cosmetic limitations in balance and presentation clearly irritated several listeners to the extent that some of the undoubted good points tended to be obscured.

Back against the wall is certainly the only place for the *Kans*, and the matching stand does a fine job of complementing the performance of the speaker itself. Basically the balance is thin, bright and a little aggressive too, with sufficient midband unevenness to add more than a fair share of coloration. Listening past these flaws, several panelists

found the experience nonetheless musical, with good, lively pace, fine midrange speed and dynamics and impressive diction.

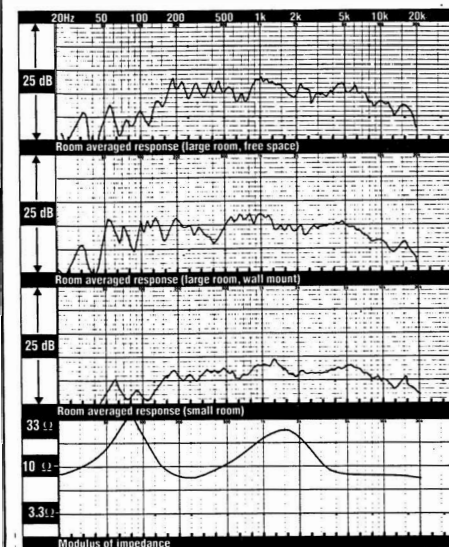
My subsequent listening confirms much of what the panel observed, and certainly under our test conditions the *Kan* has an unwelcome tendency to 'shout' and add a shrillness that is never comfortable. That apart, it still has singularly impressive bass drive and agility for such a small loudspeaker, taking high amplifier power levels without flinching and continuing to deliver a solid sound.

## CONCLUSIONS

I have always had respect for the *Kan*, feeling that what it lacked in refinement and good manners, it more than made up for in charm and wit – a bit like a Glaswegian comedian, when you come down to it. I didn't unfortunately have any original *Kans* to hand, so cannot comment on the changes which have been made, but having come to the end of the review I cannot avoid concluding that some of the charm seems to have evaporated in the redesign. It's probably true that the *Kan 2* is rather less rude than its predecessor, but that doesn't mean to say it's anything like refined in presentation. At £339 it must be regarded as a niche product for those prepared to tolerate its strong character for the sake of fine bass performance alongside near invisibility.

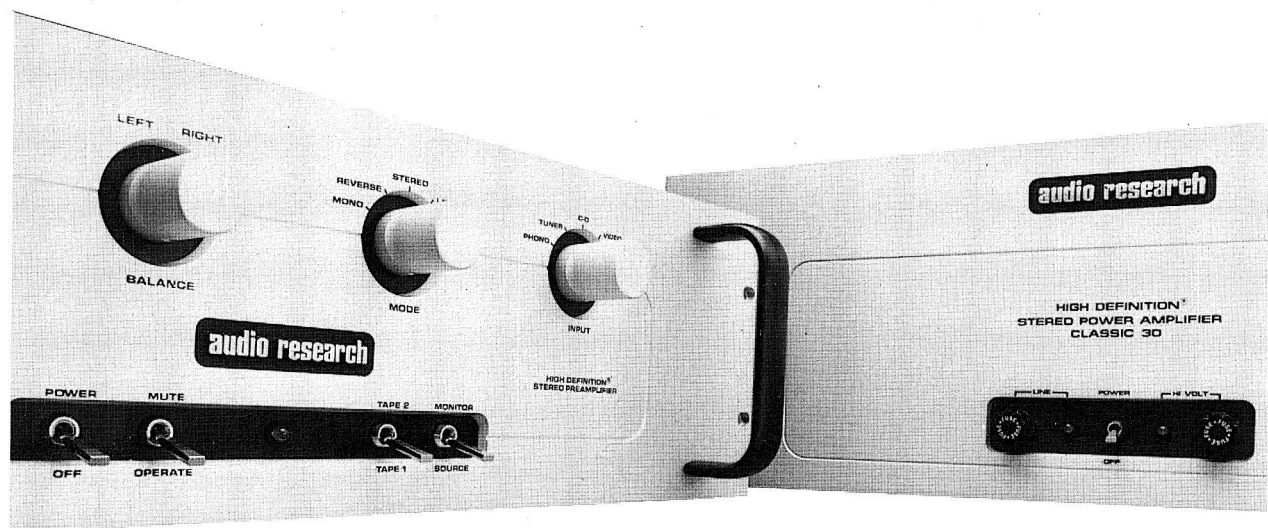
## TEST RESULTS

Size (height x width x depth)	30.5 x 18.5 x 16.5cm
Recommended amplifier power	25-90 watts
Recommended placement	on matching stands against wall
In room averaged response limits 50Hz-10kHz	±4dB
Large room/space LF rolloff (-6dB ref midband)	32Hz
Large room/wall LF rolloff (-6dB ref midband)	30Hz
Small room LF rolloff (-6dB ref midband)	45Hz
Large room output at 20Hz (ref midband)	-12dB
Estimated midrange sensitivity (ref 2.83v, 1m)	82dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	fairly good
Typical price per pair (inc VAT)	£339



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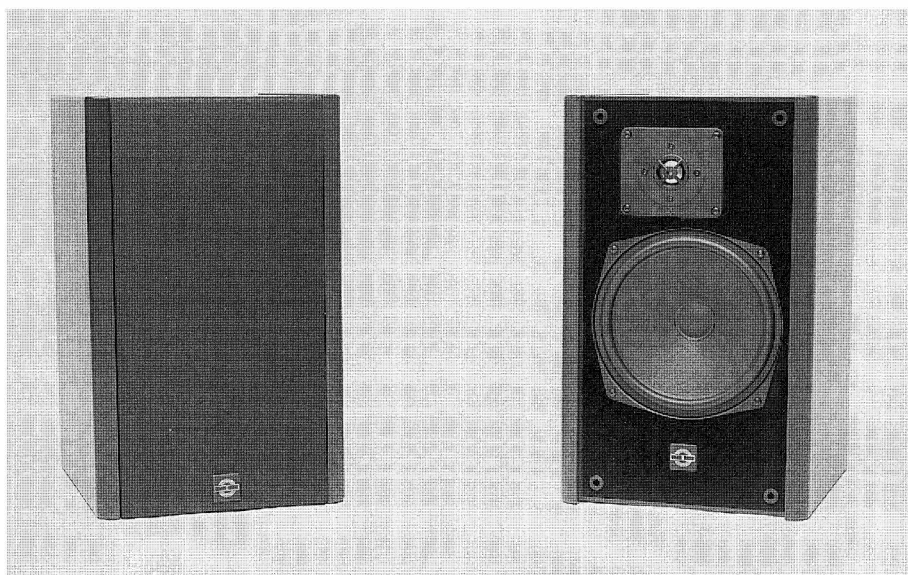
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# MB QUART 280

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One of three major West German brands to start UK distribution quite recently, MB is operating through West Midlands distributor Soundtec Marketing, which also handles the US dbx brand. MB is clearly part of the German loudspeaker tradition, with certain generic similarities (the black flock-finish baffle, for example), yet places its own distinctive fingerprint on other aspects of the design, especially in the styling.

The *Quart 280* is the third MB to come in for *Choice* assessment. It's a £340 'large bookshelf' model, and bears a very close family resemblance to the 'small bookshelf' *Quart 220* reviewed amongst the September '89 group of miniatures. It's difficult to avoid drawing parallels with the Canton brand, since the *220* is a similar package to the *Karat 20*, while this *Quart 280* fills the same range slot as the *Karat 30* covered elsewhere in this project, save that it's £20 cheaper and has real wood veneer sides to boot.

In fact the home furnishing aspect is clearly an MB priority, since the *280* comes in a wide range of different lacquer or wood finishes, while the protruding hardwood edges to the baffle is the sort of stylistic embellishment that only serves to suggest the designer was not worrying all that much about the acoustic performance – a supposition confirmed by examination of the grille.

Our samples came in an attractive combination of browns, mid for the polished wooden sides and darker for the textured top, bottom and back and grille cloth. MB makes much of its multi-layer cabinetwork, a description which does appear to involve an element of poetic license, at least as far as the baffle is concerned. But this sealed box is nevertheless exceedingly well built, the 24mm board contributing much more than some rather feeble magnets to the substantial total weight. The rather small machine head driver screws have plenty of purchase and are well tightened down.

The main driver looks decidedly old-fashioned, using a simple flat 160mm paper cone with narrow surround, whereas the slightly offset (and not mirror-imaged) tweeter is a much more advanced looking 25mm metal dome device. A fairly complex and generously specified crossover network is glued and hardwired to the back of the terminal block; with really substantial internal cabling soldered to the driver tags. In all, the mechanical and electrical engineering looks significantly more promising than the acoustics.

## TEST REPORT

Gauging the sensitivity is difficult with the rather over-rich balance, but a little above average is close to the mark, accompanied by the determinedly low (40ohm) impedance favoured by continental brands.

The balance under all test conditions is dominated by the strength of the mid and upper bass, 80-200Hz, while some measure of wall assistance might help fill in the octave below. The overall balance is not bad, and is refreshingly free from the obtrusive rising treble response which normally characterises German designed loudspeakers, but there is still a 'three-humped' characteristic and significant 'lumpiness' over most of the range. The grille has a slight impact, though in practice the fixed hardwood edging stabilises the acoustic performance, while below axis listening ought to be avoided.

## SOUND QUALITY

The *280* turned in a fairly respectable performance in the listening tests, giving the panelists the difficult task of weighing up and balancing the lively and involving dynamics against the over-rich upper bass and lumpy, uneven midband – a trade-off which some favoured more than others.

The consensus went against wall siting, though there was some regret for the lack of

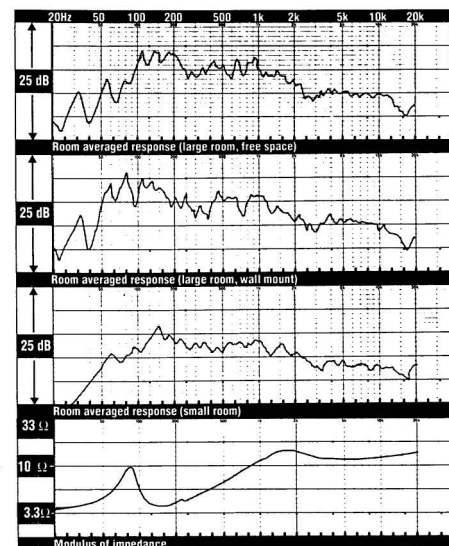
weight when out in free space: this is clearly one of those 'compromise' designs which is never quite right wherever you put it, but passes muster just about anywhere. Nor is it particularly stand sensitive, the lighter open-frame types perhaps conferring a slight advantage (in cost as well as performance!). Musically quite involving, with a purposeful sense of pace and rhythm, the *280* also has rather more than its fair share of coloration, and lacks skill in creating solid and convincing stereo images.

## CONCLUSIONS

The attractive and lively dynamics, complete with rather 'obvious' mid bass will doubtless win some friends amongst rock aficionados, while the range of alternative finishes and attractive presentation will help woo the houseproud. But the *280* is not a subtle design, acoustically or in room-match terms, and is ultimately quite expensive for the package on offer, despite the redoubtable mechanical build quality.

## TEST RESULTS

Size (height x width x depth)	44 x 27 x 29cm
Recommended amplifier power	15-100 watts
Recommended placement	uncritical
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)	32Hz
Small room LF rolloff (-6dB ref midband)	40Hz
Large room output at 20Hz (ref midband)	-13dB
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	fair
Typical price per pair (inc VAT)	£340



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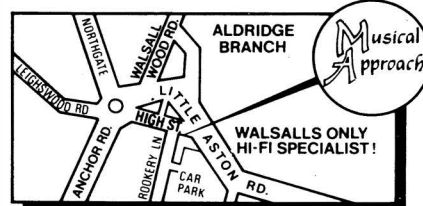
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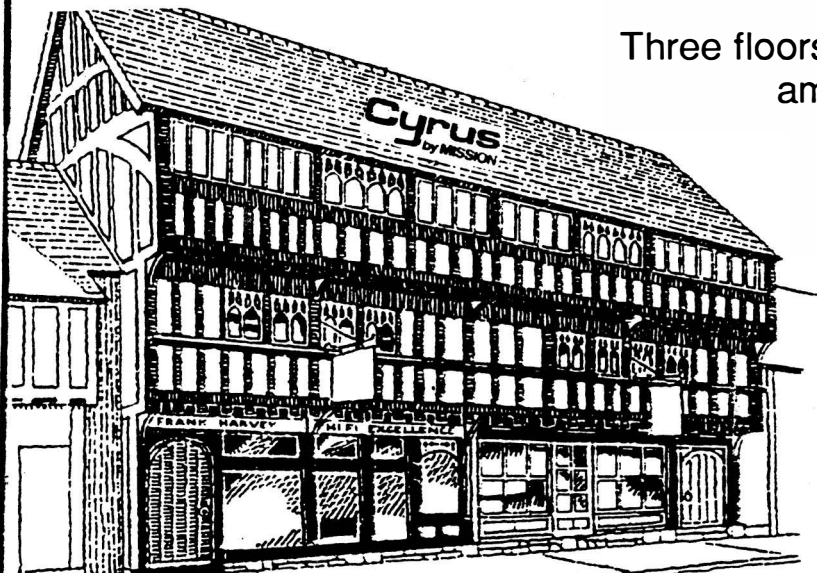
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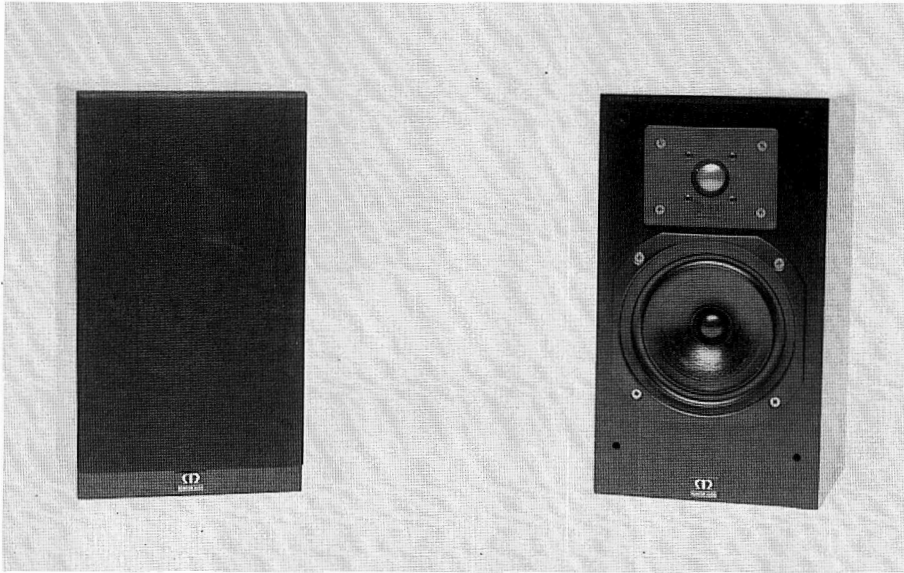


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# MONITOR AUDIO MONITOR 9

MONITOR AUDIO LTD., 34 CLIFTON ROAD, CAMBRIDGE CB1 4ZW. TEL: (0223) 242898.



Monitor Audio has been one of the most successful UK specialists in recent years, bringing together top quality in-house cabinet manufacture and proprietary arrangements with leading OEM driver manufacturers. Most of the models in the range are at prices rather higher than the £190 *Monitor 9* reviewed here, and are available to the houseproud in an extravagant range of real wood veneers, though this rather more basic model is only finished in a smooth black lacquer finish. More relevant to the *9* – indeed something of a rationale for the product – MA has also done much to promote the cause of metal dome tweeters, making the technology available at steadily reducing price points.

The *9* is a small step up the range from the *Monitor 7*, a near miniature sister model reviewed in *Choice*: August '89. Where the *7* featured a 19mm SEAS-sourced tweeter with rather too much output in relation to the midrange, the *9* has a 25mm MA/Elac which thankfully avoids this flaw. The *9* somehow also looks better proportioned, while the extra box volume and main driver diameter ought to be useful too. The bass loading here is a sealed box rather than a reflex, in spite of which the same 12mm MDF cabinetwork is used.

The bass/mid unit uses a 120mm impregnated pulp cone, while the tweeter has a magnesium/aluminium dome driver, both units employing techniques to enhance power handling. The crossover is a fairly simple affair, a handful of components directly hardwired and glued into place on the inside of the terminal block. The box itself has no extra bracing, nor any bulk fill apart from 25mm foam panels fixed to each of the inside faces. The baffle is nicely finished and the tweeter dome protected by its own mesh screen, so the grille proper is cosmetically optional, not to mention non-descript, though at least some care has been

taken to chamfer the wooden frame to improve the acoustic behaviour.

## TEST REPORT

Sensitivity is a little below average, and power handling and loudness capability are inevitably somewhat limited. However, the in-room bass extension is pretty good for the box size, and the impedance is kind to amplifiers too.

Partly due to better than usual control in the mid bass, the in-room responses are unusually flat overall, up to an HF 'corner' at 8kHz. There is a fair measure of local unevenness, however, and the mid balance is much less even with wall loading, even though the additional bass reinforcement looks well worth having. Grille removal ought to be beneficial. Some phase cancellation is measured both above and below the main axis through the crossover region, so the speaker should be sited at approximately the same height as the seated ears.

## SOUND QUALITY

Two separate presentations failed to stir up any great enthusiasm for the sound, though the criticisms related more to sins of omission than any over-exuberance. With uncanny accuracy, one panelist summarised the sound as "easy to listen to... possibly too easy" on both occasions.

The overall character is a little bright and thin, though happily quite sweet with it, so some wall reinforcement is helpful. However, this also has the less desirable effect of attracting attention towards a rather soft and congested sounding bass, which seems to come in as something of an afterthought to the main event. Heavy, single pillar stands were preferred to open frame types.

The sound is certainly quite relaxed, pleasant and laid back, and the balance is tonally more accurate than most. But the lack of excitement, 'drive' and involvement

under our listening conditions is a clear limiting factor, even though the *9* may be expected to perform respectably enough under less demanding conditions.

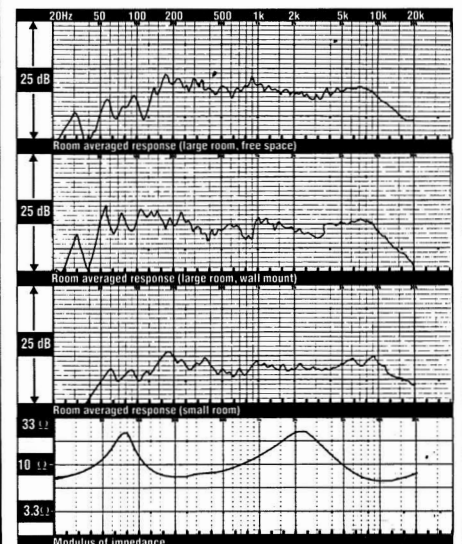
## CONCLUSIONS

Although it is spared much of the over-brightness which afflicts its smaller brother, and in fact delivers a very even-handed and highly competent overall balance by any standards, unfortunately the *Monitor 9* is far less capable than the *7* at generating the sense of excitement and tension that is an important part of listener involvement in the music reproduction process.

It may of course be that we never did stumble upon the right combination of stands, cables, amplifiers and so on to get the best out of it – or it may just be that a thinwall MDF cabinet is less suited to handling the pressures generated by the sealed box rather than those avoided by the reflex bass loading technique.

## TEST RESULTS

Size (height x width x depth)	37 x 20 x 21cm
Recommended amplifier power	20–60 watts
Recommended placement	high stands 30cm from wall
In room averaged response limits 50Hz–10kHz	±4dB
Large room/space LF rolloff (–6dB ref midband)	50Hz
Large room/wall LF rolloff (–6dB ref midband)	32Hz
Small room LF rolloff (–6dB ref midband)	40Hz
Large room output at 20Hz (ref midband)	–15dB
Estimated midrange sensitivity (ref 2.83v, 1m)	84dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	very good
Typical price per pair (inc VAT)	£190



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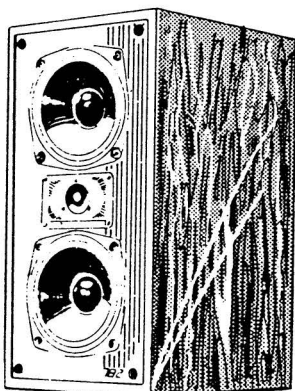
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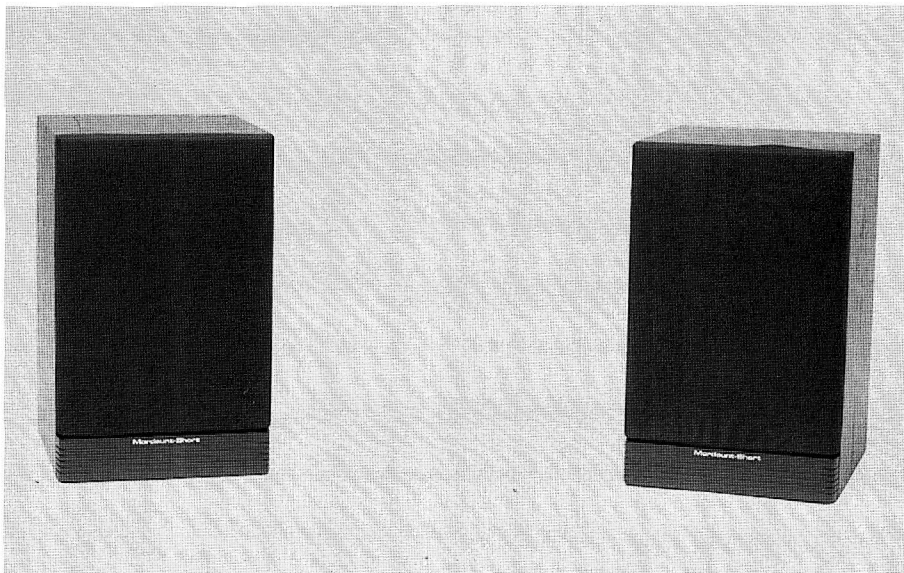
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# MORDAUNT-SHORT MS3.10

MORDAUNT SHORT, DURFORD MILL, PETERSFIELD, HANTS GU31 5AZ. TEL: (0730) 80721.



A member of the TGI group, Mordaunt-Short is one of the better established of the smaller British hi-fi companies, with a particularly strong track record in the budget sector of the marketplace. Much of its recent success has come through wide distribution amongst the less specialist purveyors of midi systems, who have a particular fondness for the high reliability that results from the Positec protection circuitry fitted to all mainstream models.

It's not a company which changes models very often – more than two years have passed since the last update was introduced – and *Series 3* represents an important step, being the first fruits since the appointment of a new leader for the design team. The speakers are new virtually throughout, showing evidence of some change in direction as well as providing important improvements in presentation and 'manufacturability'.

Smallest of the new fivesome, the £99 *MS3.10* retains the low cost Audax tweeter that was used in the *MS10*, but this entry level miniature now has plastics moulded baffle and trim, the inner section providing good rigidity for driver mounting, the outer skin bestowing smart cosmetics with radiused edges and the slot for retaining a stocking mask grille cloth. The latter is a near ideal solution, allowing the cover to be used or not, without performance compromise. Elsewhere the box uses 12mm chipboard, with the light damping appropriate to a reflex.

The new bass/mid driver is bolted firmly to the baffle using four substantial screws. The tiny (90mm) polypropylene cone unit has a generous magnet (for proper reflex operation), is posistor protected as before, but has little else in the way of crossover components. Indeed, the *3.10* and its kindred are effectively 'straight through' designs, building on the lessons learned with the *MS100*, relying largely on the natural

response characteristics of well developed drivers.

Accompanying *MS3.10* is a very neat £50 *3.1S* stand. Unfortunately not available in time for the review, prototypes of this ingenious unit were seen at Penta Autumn '89. It's a pillar stand made up of small Lego-brick type sections, all pulled tightly together by metal screw rods. Any number of sections may be used between top plate and a large footprint tripod base so the height may be adjusted to suit the loudspeaker and/or listening positions.

## TEST REPORT

The below average sensitivity here merely reflects the limitations imposed on the performance envelope by a small box and main driver. Restricted power handling will also help keep the neighbours happy, but at least the protection is there to prevent you over-doing things. In fact the *3.10* is an easy load with quite respectable in-room bass output from 50Hz, but (probably wisely) makes no attempt to reproduce lower frequencies.

The response is well enough balanced overall, though neutrality is determinedly avoided in a degree of unevenness that would not disgrace a rollercoaster. The 1-1.5kHz prominence is most obvious, but up and down is very much the rule of the day. The design obviously benefits from some wall assistance (though it can manage without), while high stands are recommended since on or below axis listening provides the best balance.

## SOUND QUALITY

The *3.10* was one of the real successes of the listening tests – a classic example of how good a little one can turn out, at least in part because it doesn't have to contend with all the problems posed by larger boxes.

The uneven midrange peakiness creates a fair amount of coloration, to be sure, with

'boxy', 'quacky' and 'nasal' effects all evident. But the sound balances pretty well, especially when quite close to the wall, and is fundamentally tight, quick and informative, with an attractive liveliness.

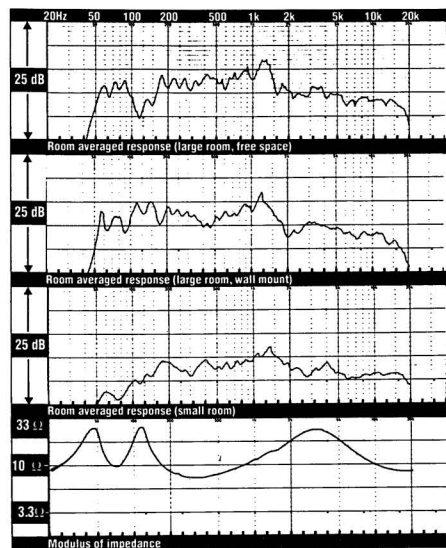
Clearly less adversely affected by heavy pillar stands than its bigger brother, lighter open-frame types nevertheless help to improve the sound to a worthwhile degree. However, there remains the lingering question in one panelist's mind: "would you still like it after a fortnight?" The *3.10* is an engaging loudspeaker, but not a particularly polite one.

## CONCLUSIONS

While it may not be the smoothest or least coloured of the breed, the *MS3.10* is certainly one of the liveliest and most entertaining of the miniatures currently available. Indeed, it doesn't sound much like my idea of a Mordaunt-Short at all, reminding me more of a cost-effective attempt to do a similar job as Royd's *Eden* – and it wouldn't surprise me if the *3.10* didn't develop a similar cult following. Since I doubt you'll find anything more involving at the same sort of price, a Best Buy rating is appropriate, tempered with the cautionary note that neutrality and easy listening come well down this cheeky little performer's list of priorities.

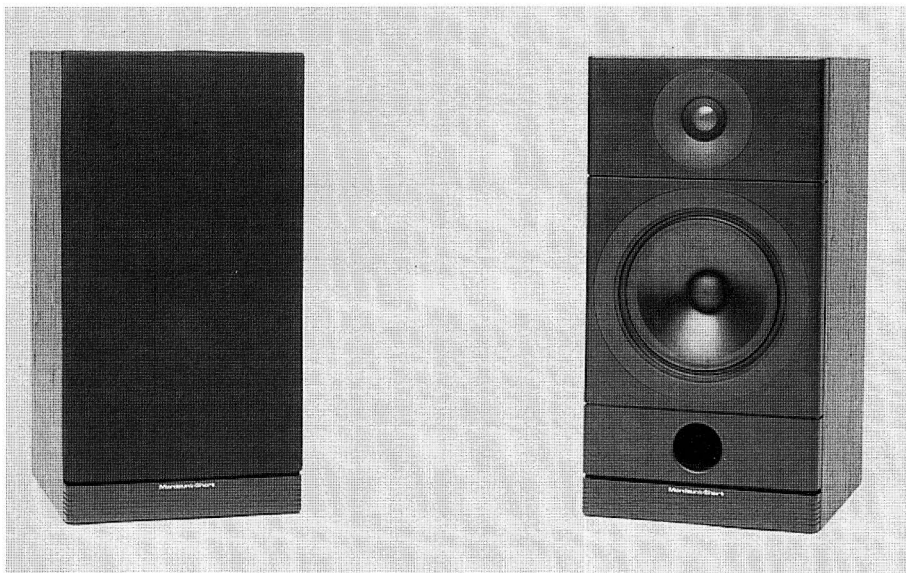
## TEST RESULTS

Size (height x width x depth)	28.5 x 17.5 x 20cm
Recommended amplifier power	20–60 watts
Recommended placement	on high open stands near wall
In room averaged response limits 50Hz–10kHz	±6dB
Large room/space LF rolloff (–6dB ref midband)	48Hz
Large room/wall LF rolloff (–6dB ref midband)	48Hz
Small room LF rolloff (–6dB ref midband)	55Hz
Large room output at 20Hz (ref midband)	–35dB (est)
Estimated midrange sensitivity (ref 2.83v, 1m)	84dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	uniformity good, response less so
Typical price per pair (inc VAT)	£99



# MORDAUNT-SHORT MS3.30

MORDAUNT SHORT, DURFORD MILL, PETERSFIELD, HANTS GU31 5AZ. TEL: (0730) 80721.



Mordaunt-Short is amongst the most widely distributed of the specialist British hi-fi loudspeaker manufacturers, adding a touch of class to many of the packages sold by more general purveyors of midi systems to the mass marketplace, alongside a significant presence at the budget end of the specialist hi-fi sector.

Autumn 1989 saw the launch of a brand new and ambitious range of *Series 3* models, based on the sizes and price points of *Series 2* predecessors but entirely redesigned by new engineering chief Robin Marshall. The total investment in moulding terms is quite extravagant, representing something of a first in the extensive use of structural plastics throughout a range aimed specifically at the mainstream hi-fi market.

Sitting in the middle of the five strong line-up, the £180 *3.30* is familiarly known as a 'large bookshelf' model, though open stand mounting is essential for optimum performance from this ample ported enclosure. A major innovation is the extensive use of high quality plastics mouldings, for the baffle, the cosmetic trim, and for the ingenious matching pillar stand. This £50 optional extra is built up from a series of Lego-brick type sections of polypropylene, held together by an adjustable metal screw rod, so height may be adjusted to suit both speaker and domestic circumstances. Regrettably, it was not available in time for this test.

The cosmetics of the *3.30* are restrained and very classy indeed. The baffle proper is the structural moulding, with driver cut-outs, strengthening webs, captive threads and so on. This is covered by a cosmetic sub-baffle which gives a very clean appearance, with radiused vertical edges to reduce baffle edge reflections. An integral groove accommodates an optional and benign stocking-mask grille, while soft insert rings covering the driver frames provide a finishing touch, plus access in the unlikely event etc.

The drivers are all new too, and are secured (very tightly) by substantial bolts. They comprise a 25mm metal dome tweeter with shallow flare (M-S-designed but sourced from MB in Germany), plus an in-house bass/mid driver with a 140mm polypropylene cone built on a cast chassis. Careful design has allowed the removal of most of the electrical crossover components, relying instead largely on the natural mechanico-acoustical performance of the drivers.

## TEST REPORT

The *3.30* provides a worthwhile boost in sensitivity and bass extension over its smaller siblings on the previous page. In fact the combination of sensitivity, bass extension and impedance is impressive for the price.

However, the overall response trends clearly show rather too much across a fairly broad band at the upper end of the bass/mid driver working range, and a little too little from the tweeter, though the crossover between the two seems to be unusually well handled. Nevertheless, a degree of 'midiness' is inevitable, and therefore some wall assistance may well be helpful, but beware of adding too much. On and below axis listening gives the best balance, so highish stands should be used.

## SOUND QUALITY

While by no means disgracing itself, the *3.30* proved something of a disappointment during the blind listening tests, and its little brother was in fact significantly preferred, but in part for reasons which became apparent after the event. All panelists criticised the dominantly 'middy' character, which tended to make the speaker sound a little small and noticeably 'boxy'.

To some extent this is a feature of the measured frequency balance (see graphs), but a stand related phenomenon played its part as well. In a nutshell, the *3.30* doesn't

like heavy pillar stands one little bit. Put them on open frame examples like the Linn *Kan* or Heybrook *HBSI* and the speaker really comes to life, speeds up, and much of the boxiness disappears, even though the fundamental character remains.

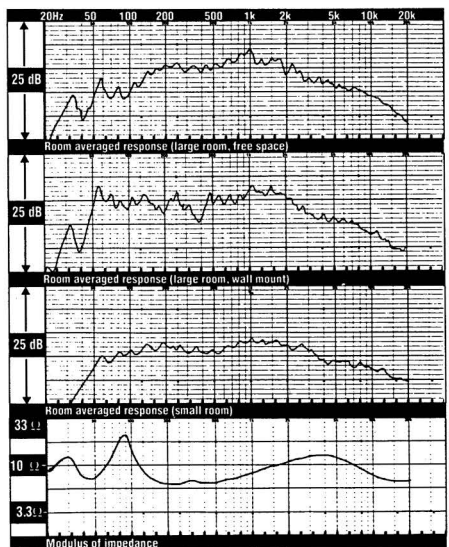
The sound is certainly flawed in the cosmetic sense, and suffers a little from some uncertainty over the ideal siting – about eighteen inches from the wall seems about right in the test room. But there's plenty of information to keep the listener interested, with a nice sense of timing and a lively 'dry' bass. There's potentially genuine transparency too, though the image tends to come sharply in and out of focus with small head movements.

## CONCLUSIONS

The *3.30* is rather a mixed bag. Beautifully presented, it's clearly highly competitive in terms of build quality and engineering content too, with more than its fair share of original thinking and practice. But the octave-wide boost at the upper end of the midrange, combined with a mild lack of treble is a sufficient aberration to preclude formal recommendation. However, fine qualities elsewhere make it well worth considering, since many may find the explicit midrange and restrained treble inoffensive or even positively attractive.

## TEST RESULTS

Size (height x width x depth)	46 x 23.5 x 27cm
Recommended amplifier power	15–100 watts
Recommended placement	highstands 1-2ft from wall
In room averaged response limits 50Hz–10kHz	±6dB
Large room/space LF rolloff (–6dB ref midband)	33Hz
Large room/wall LF rolloff (–6dB ref midband)	33Hz
Small room LF rolloff (–6dB ref midband)	45Hz
Large room output at 20Hz (ref midband)	–17dB
Estimated midrange sensitivity (ref 2.83v, 1m)	87dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	fair
Typical price per pair (inc VAT)	£180



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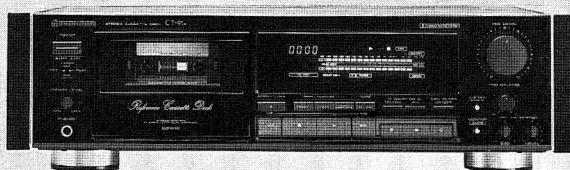
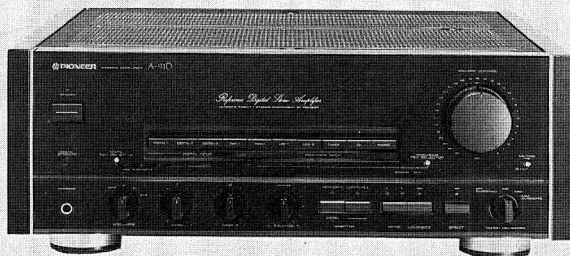
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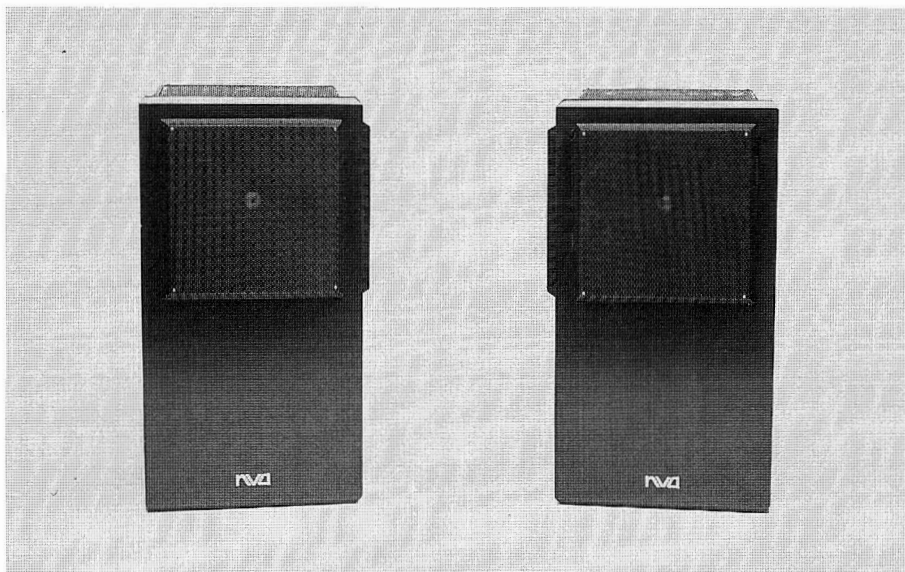
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# NVA CUBIX

NENE VALLEY AUDIO, 1 CHURCH FARM, HATLEY ST. GEORGE, NEAR SANDY, BEDS. TEL: (0767) 50532.



NVA doesn't actually live in the Nene Valley any more, but it remains a classic example of a small and endearingly idiosyncratic British hi-fi company, built entirely around the energy and ideas of one individual. Amplifiers are the mainstay of the operation but there's also an unusual turntable and some even more unusual loudspeakers, one of which was sampled back in June '89.

That £600 *Cube* gained recommendation for an impressive, albeit decidedly 'different' sound quality, so it was natural to try its big brother, the £1,100 *Cubix*, this time around. *Cubix* is twice the size of the *Cube*, though it takes up no more actual room space. Instead of one *Cube* with upward facing bass/mid driver, plus tweeters on the front and (out) side, you get a double-height double-*Cube*. Besides the bigger box, there's an additional internal bass/mid driver which operates in acoustic series with the one on the top.

This is an unusual and somewhat controversial technique, encountered elsewhere only in the Linn *Sara* and *Isobarik* models to my certain knowledge. Depending on how you look at the situation, one consequence is to double the effective cone mass whilst maintaining the motor shove. However, that in turn has the same net effect as doubling the enclosure volume, which is a real prize worth going for. The down side, especially here where the single unit covers both bass and midrange, is that some mutual cancellation is bound to occur where the distance corresponds to a half wavelength and harmonics, especially in this case where the enclosure is left entirely undamped. Further midrange interference will be caused by firing upwards against the wall, though aligning the bass axis vertically makes a lot of sense from a mechanical perspective.

The *Cubix* is a two cubic footer, and sits on its own stubby little NVA stands, which are a foot shorter than those used for the *Cube* (and in listening tests, 'cos they're good).

They're heavy, extensively welded and undamped, and add another £200 to the bill. The speakers are heavy too, being built up from thick MDF, and the whole caboodle is very carefully and securely put together. Presentation is smart, if severe, dominated by the three fixed metal grilles with their little brass studs, with chamfered edges and a shiny black lacquer finish adding some style and individuality.

## TEST REPORT

Sensitivity is difficult to gauge, given the mutually perpendicular axes, but the room traces indicate around 88dB, a little above the group average, albeit compromised by a power hungry impedance characteristic. (But then you're not going to try driving these with a budget amplifier.) The bass extension is very impressive indeed, especially in relation to the box size.

The response trends improve the further one gets from the enclosure, so a large room is mandatory. Clearly well suited to its intended wall site, the suckout around 500Hz is bound to have some subjective repercussions. The treble range is pretty well ordered, if a shade strong around 5-7kHz, while off-axis traces show pretty good conformity.

## SOUND QUALITY

If the *Cube* was a bit of a sonic oddball in its own way, *Cubix* goes at least one step further down the road. The sound was sufficiently 'different' to cause some puzzlement and confusion amongst the panel, with certain characteristics that drew adverse comment, but some notable strengths for all that.

Bass extension is impressive; so too are dynamics, clarity and pace. This is clearly an informative and communicative design, with the sort of fundamental good timing that goes a long way towards recreating the tension of a musical performance. However, the presentation is distinctly odd, both tonally

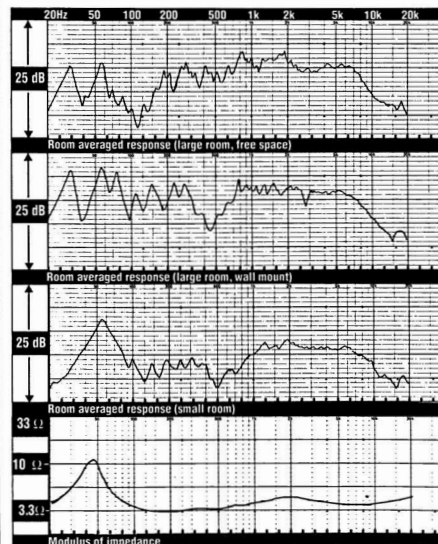
and spatially. The sound lacks 'warmth' (which is not such a bad thing when you get used to it), but the midband is rather hollow and 'thick', while the lower treble is hard and a bit aggressive. "Vivid" and "viscious" were two adjectives applied by different panelists, illustrating how the same effect can yield different interpretation, according to taste.

## CONCLUSIONS

I have struggled at length to come to terms with the *Cubix*, using a variety of ancillaries in order to try and tame its aggression whilst hanging on to the very real virtues, but so far without real success. It's significantly more temperamental than the smaller *Cube*, and a whole lot more expensive too, so general recommendation is not appropriate. But it does have genuine potential to give fine, extended bass from a visually neat and compact unit, which alone is sufficient justification for checking out its idiosyncracies against your own particular taste.

## TEST RESULTS

Size (height x width x depth)	60 x 32.5 x 32.5cm
Recommended amplifier power	15-150 watts
Recommended placement	on low stands against wall
In room averaged response limits 50Hz-10kHz	±6dB
Large room/space LF rolloff (-6dB ref midband)	20Hz
Large room/wall LF rolloff (-6dB ref midband)	20Hz
Small room LF rolloff (-6dB ref midband)	20Hz
Large room output at 20Hz (ref midband)	-5dB
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	fair
Typical price per pair (inc VAT)	£1,100



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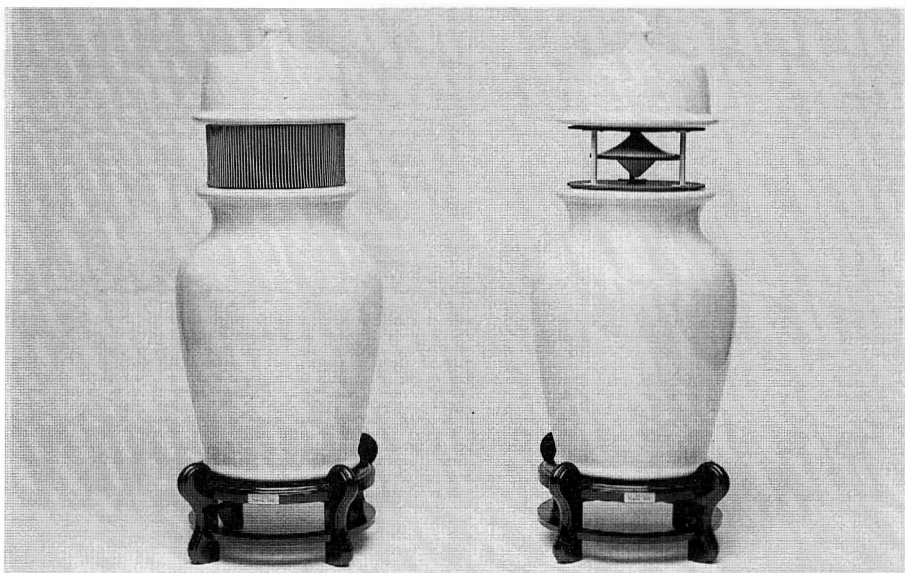


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No you haven't picked up *Homes & Gardens* by mistake; this is still *Hi-Fi Choice*. And the above objects are actually loudspeakers, not a matching pair of unlikely specimens discovered down the local antique auction. Why anyone would want to pretend their loudspeakers are not loudspeakers in such a way is beyond my imagination, though that is partly a function of the ghastly aesthetic clash in my particular room. My partner was much more enthusiastic, due to an immediate sympathetic response to the kitsch redolence that *Victoria* captures so well.

Certainly there will be those who find these giant ginger jars much more domestically acceptable than wooden boxes of equivalent size. Anyone with an eye for Casa Pupo style decor will certainly find them of more than passing interest, even at the £1,000 asking price for these largest examples in a quite extensive range. There's a variety of finishes, and each glaze is of course unique in its own way.

Being rigid and reasonably well damped, ceramics ought to provide a very good basis for a loudspeaker enclosure. There are several historical precedents – the Jordan Watts *Flagon*, various Connoisseur concrete columns and the Townsend *Glastonbury*, for examples. Whether the *trompe d'oeil* subterfuge practised here takes advantage of ceramics' potential for performance as well as disguise is rather a different matter.

But I've never met a loudspeaker like it for attracting attention, and largely favourable comment on presentation and finish. It consists of a 'pot' and a 'lid', held some 10cms apart by metal brackets, the gap covered by a tube of grille cloth. The whole thing sits 14cms off the ground on a wooden stand which is carved in character (but unspiked), and fitted with two pairs of terminals (for bi-wire/amp options). A 160mm plastic cone bass unit with sealed pot loading is mounted in the base, firing down at the floor.

The neck of this pot is covered with the baffle for an upward-firing 25mm TDL tweeter. The lid is another sealed pot, this time for the 110mm midrange driver, another plastic-cone unit firing downwards. In the gap between mid and treble something resembling a flying saucer is securely fixed, to act as a reflector and so provide lateral distribution of directional high frequencies. I decided against attempting any dismantling, for fear of causing damage, but the whole thing seems to have been very well executed, despite some reservations over the design precepts.

## TEST REPORT

That this strange device is a genuine loudspeaker is seen in a straightforward impedance characteristic and an average overall sensitivity. Bass extension is respectable enough, though the best LF match is seen in the small room response – a room in which *Victoria* did look rather too imposing.

Tolerably even up to 800Hz – just above the LF/mid crossover – everything falls apart thereafter, with deep notches at 1.3 and 2kHz, almost certainly a function of phase cancellation in the reflector system. Extreme treble too is notable for its absence, and unevenness is the rule rather than the exception. The one sense in which *Victoria* succeeds is in the consistency of its output in every direction. This is very close to a genuinely omnidirectional loudspeaker, but that is of small consolation with a balance as ragged as this.

## SOUND QUALITY

Could anyone have resisted giving these a try out as soon as they arrived in the house? I doubt it. I certainly couldn't, and quickly had them up and running long before the technical and listening panel programmes got under way. It wasn't long before I had a nasty surprise. Not immediately obvious on music

program, an unfortunate effect was revealed on spoken word broadcasts. I first thought that the interviewer at a party conference down in Brighton might have taken more trouble to get away from the background clatter of the Grand Hotel kitchens. Then I noticed the same effect from the *World at One* studio in London...

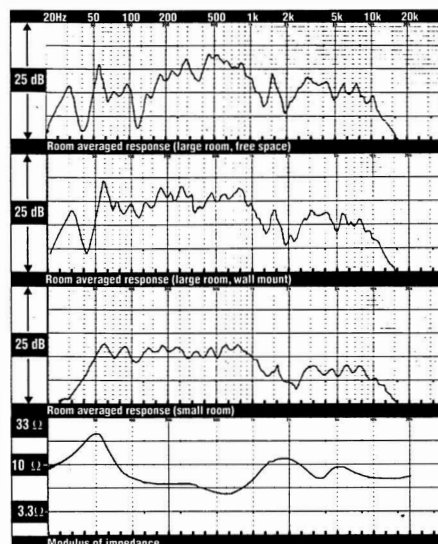
Sharp consonants cause something in the structure – I know not what – to 'ring' quite audibly, and the effect is serious enough to take *Victoria* out of the serious hi-fi stakes, even without the balance problems revealed in the measurements.

## CONCLUSIONS

I can't help still retaining a soft spot for a design which has the nerve to go out and do something quite unconventional, and which attracted plenty of favourable comment on appearance grounds. £1,000 doesn't seem at all expensive for the actual content, and reportedly Americans have been queuing up for their *Victorias*. But the package doesn't yet work as a hi-fi loudspeaker, acoustically or mechanically, and I would hesitate to speculate whether or not the difficulties can be overcome. But I do rather hope so...

## TEST RESULTS

Size (height x width x depth)	93 x 33 x 33cm
Recommended amplifier power	20–150 watts
Recommended placement	on floor away from walls
In room averaged response limits 50Hz–10kHz	±7dB
Large room/space LF rolloff (–6dB ref midband)	28Hz
Large room/wall LF rolloff (–6dB ref midband)	25Hz
Small room LF rolloff (–6dB ref midband)	35Hz
Large room output at 20Hz (ref midband)	–12dB
Estimated midrange sensitivity (ref 2.83v, 1m)	87dB
Impedance characteristic (ease of drive)	fairly good
Forward response uniformity	uniformity very good, response poor
Typical price per pair (inc VAT)	£999





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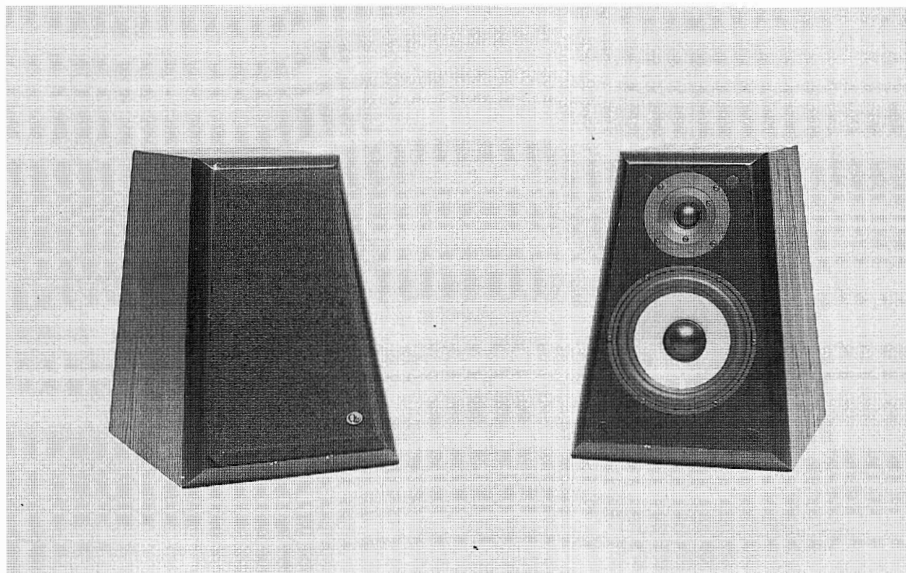
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# QLN SIGNATURE

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QLN is a small Scandinavian loudspeaker company run by enthusiasts, which specialises in small upmarket designs such as the model covered here. All overseas distribution is handled by a new Scottish distributor Quantum Audio, whose principal previously masterminded Aristo for a number of years.

At a cool £1,100, give or take a few pence, the *Signature* is very expensive for what is basically a small two-way rear ported box. It is, however, beautifully finished in an exotic real wood veneer, and is very solidly built indeed. The pretty appearance extends to a nicely shaped cabinet which tapers slightly towards the top in both vertical planes.

Considerable care has been taken to maximise the acoustic performance. Foam is probably the best grille material of all, while the baffle has an 'acoustic blanket' surface and nicely radiused edges. The baffle is set at a slight angle, so the normal axis will tend to aim above listeners' heads, allowing low stands to be used, even though high (24inch) versions are reputed to give the best results.

The unit is also surprisingly heavy for its size, which attests to the work that has gone into stiffening and damping the cabinet and internals. Quantum is closely involved with a special material known as 'Q damping', and I understand that much of the carcass is of 'sandwich' construction, with a layer of damping in between two layers of board. This could not of course be verified without a chainsaw massacre of the loudspeaker concerned, though the whole box certainly feels very inert, with thick (25mm) walls and a crossbrace connecting the two sides. Inside there is a complex cocktail of damping materials and an exceedingly complex constant impedance series crossover with good quality components.

The main Scanspeak driver has a 125mm Kobex cone and a massive symmetrical field magnet, plus a long (19mm) hexagonal wire voice coil, the latter two features claimed to

reduce intermodulation and self inductance. The cast frame is secured by six screws, but they're rather small and could have been tighter. Ditto those fixing the 25mm Vifa tweeter.

## TEST REPORT

If you're prepared to pay more than a grand for pretty but little boxes like this, you're presumably happy enough to pay more than £99.99 for the amplifier with which to drive them. The *Signature* is therefore an insensitive little thing, but this is partly justified by pretty good bass extension. Respectable power handling should still permit adequate loudness from a powerful amplifier.

Although the responses are all creditably 'tidy' and even overall, the balance is distinctly 'rich', with a clear tendency to emphasise the upper bass in-room. In fact the 'small room' response probably provides the best match, so a little – but not too much – wall assistance is helpful. Off-axis traces seem to favour a listening position slightly above the main horizontal axis of the speaker cabinet.

## SOUND QUALITY

Definitely not suited to full wall reinforcement, this QLN still sounds decidedly restrained though sweet with it when moved out into the room, one panelist referring to the "classic laid back BBC sound". All acknowledged the good overall balance, and the word 'civilised' cropped up more than once, which is something of a mixed compliment since 'slow' and 'boring' both featured too.

Coloration is certainly low, though the presence region seems slightly 'veiled'. Stereo images are very well defined and notably 'out of the box', but there was more than a measure of disagreement about the bass. This was partly resolved during subsequent sighted listening and stand experimentation, where my notes recall: "all boom and vague until Q-pad coupled to solid pillar stand; still

not electric quick, but good extension and information."

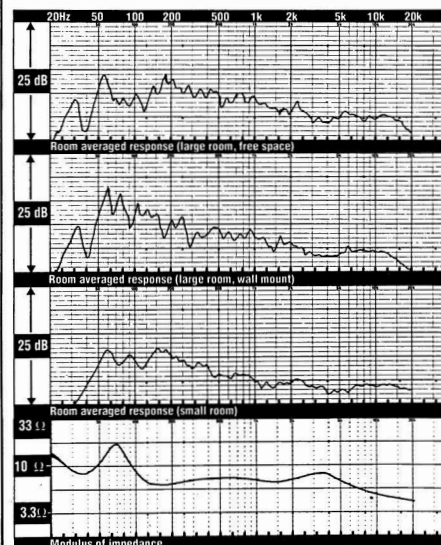
Regretfully, the tough *Choice* schedule didn't allow time for experiments with cabling or amplification, though I suspect a more felicitous and sympathetic combination could be found without much difficulty. Certainly there is something of a philosophical mismatch in aims and objectives between the drive system and the *Signature*, the former concentrating on speed and dynamics, the latter on spacious stereo and the avoidance of 'nasties'.

## CONCLUSIONS

Interesting though it is, this is a very specialised product that will only appeal to a small and well-heeled minority. Although it will deliver bass extension comparable to units at least twice its size, the *Signature* is still expensive, especially since heavy, tall pillar stands and a genuinely powerful amplifier are essential ancillaries. Sonically and acoustically it is undoubtedly very refined – perhaps too refined for some tastes, since it did little to quicken the blood or send the pulse racing, performing instead in a pleasant and self-effacing manner that certainly has its own charm.

## TEST RESULTS

Size (height x width x depth)	37 x 18 x 36cm
Recommended amplifier power	25–150 watts
Recommended placement	high heavy stands in free space
In room averaged response limits 50Hz–10kHz	±5dB
Large room/space LF rolloff (–6dB ref midband)	28Hz
Large room/wall LF rolloff (–6dB ref midband)	28Hz
Small room LF rolloff (–6dB ref midband)	38Hz
Large room output at 20Hz (ref midband)	–13dB
Estimated midrange sensitivity (ref 2.83v, 1m)	83dB
Impedance characteristic (ease of drive)	fairly good
Forward response uniformity	very good
Typical price per pair (inc VAT)	£1,100



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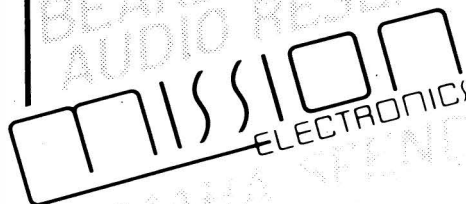
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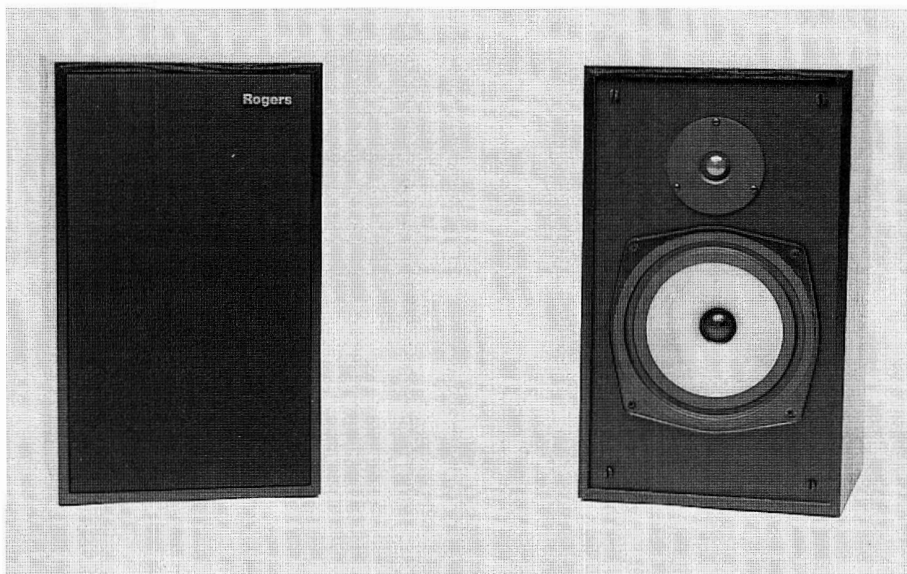
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# ROGERS LS4a

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Rogers is an excellent example of a brand which found its niche in the marketplace many years ago. Thanks in no small part to a longstanding license to manufacture BBC-designed monitoring loudspeakers, the company has created a strong sense of identity with a specific design philosophy, and has carefully cultured the links between the BBC tradition and its own models aimed at the normal domestic hi-fi market.

In point of fact, the *LS4a* reviewed here quite closely resembles (at any rate on the surface) the latest of the BBC monitor designs, the *LS5/9*. It actually has the same proportions, but is 3cms smaller in each dimension, yet the *5/9* carries a price tag of £1,150, compared to the *4a*'s £220. Which only serves to emphasise the vast difference in the manufacturing techniques and the gulf which exists between the two worlds – whilst also illustrating how exceedingly cost effective hi-fi loudspeaker manufacturing has become.

It's not relevant to try and establish whether or not the *5/9* is worth the extra cost over the *4a* – or even whether it sounds better or not. The *5/9* is designed to fulfil a specific task (which in part involves mimicking the voicing characteristics of a much larger BBC house monitor). It is also exceedingly difficult to build and uses very expensive 'one-off' components extensively.

In complete contrast, the *4a* is an object lesson in the gentle art of compromise; in teasing the best possible performance of a price point package. The drive units closely resemble those used in the larger *LS6a*: a 19mm SEAS metal dome tweeter and a 155mm polypropylene cone with wide surround for a bass/mid unit, with powerful magnet and pressed steel frame. A complex PCB crossover is fixed inside the baffle, with just a single pair of terminals for normal passive operation.

The sealed box is built up from a 14mm

vinyl woodgrain chipboard wrap, while the back is also chipboard, but the baffle is made of rather sterner stuff. 16mm MDF to be precise, which provides a tough enough key for the rather flimsy woodscrews that secure the drivers (and which had been properly tightened up too). Foam panels line the cabinet walls, but that's about your lot.

It's conservatively styled in the Rogers tradition, and frankly looks (and sounds) better with grille in place. This is a clever device in any case, avoiding the high tooling costs of the moulded frames used by larger companies and intelligently employing slim section hardboard, cut out to butt up tightly against the edges of the front mounted drivers.

## TEST REPORT

Rogers loudspeakers also have a tradition for measuring well, and the *4a* keeps the faith. The balance between bass extension, sensitivity, impedance and box size has been very sensibly chosen for a speaker of this price, and will provide a good match for likely ancillaries.

The response traces are unusually smooth and even, if a shade 'rich' in the upper bass – a little help from a rear wall should do no real harm. The response struggles a bit with phase cancellation in the crossover region, so listeners should try to sit with head the same height as the speaker, slightly off the main axis laterally.

## SOUND QUALITY

Whilst it doesn't establish any new performance benchmarks, the *4a* nevertheless did rather better in the listening tests than its price might have led one to expect. It does sound better with grille in place, but seems pretty tolerant of the type of stand used. Initially quite impressive when placed back to the wall, there's a tendency towards exaggerating an incipient chestiness here

which is really better avoided.

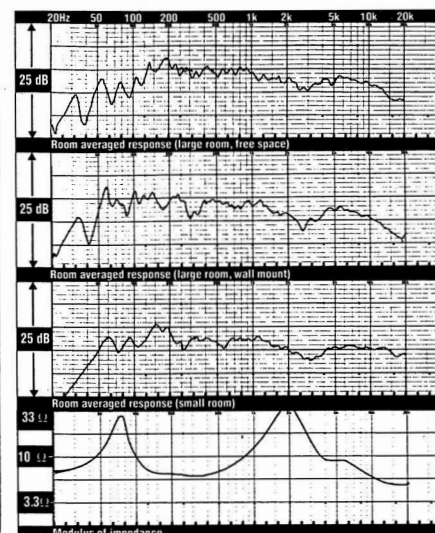
The sound is quite polite and controlled, with very little muddle. The bottom end is a little soft, lacking in both speed and 'welly', while the treble is a shade too 'obvious'. But the midrange sounds smooth, sweet and well integrated, and the whole thing drives along quite nicely, sounding coherent and holding together pretty well. Stereo imaging is clearly better than the norm, and there is a serious attempt at genuine out-of-the-box transparency that sometimes comes off.

## CONCLUSIONS

Ultimately, this is a small box with limited bass extension, and the sort of cabinet that seems bound to add a bit of thickening and slows down the upper bass. But it does provide a fair flavour of the sort of BBC-type sound that has helped build Rogers' reputation, especially in the relatively uncoloured midband, and is sufficiently well judged overall to merit confident recommendation, particularly to those of a more conservative disposition who will appreciate the traditional styling and 'classical' balance.

## TEST RESULTS

Size (height x width x depth)	43 x 25.5 x 24.5cm
Recommended amplifier power	15–75 watts
Recommended placement	on stands 1ft + from wall
In room averaged response limits 50Hz–10kHz	±5dB
Large room/space LF rolloff (–6dB ref midband)	32Hz
Large room/wall LF rolloff (–6dB ref midband)	30Hz
Small room LF rolloff (–6dB ref midband)	35Hz
Large room output at 20Hz (ref midband)	–13dB
Estimated midrange sensitivity (ref 2.83v, 1m)	87dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	good
Typical price per pair (inc VAT)	£219

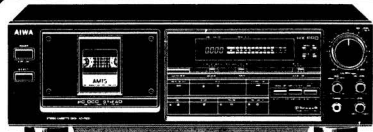


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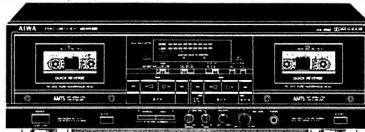
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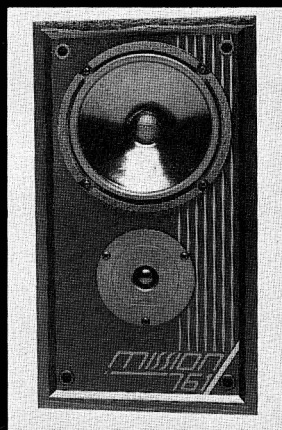
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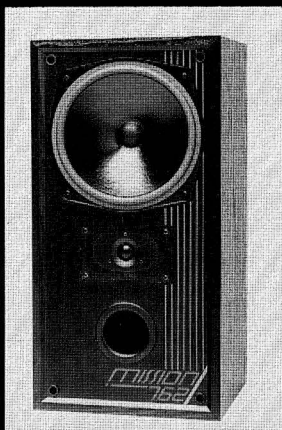
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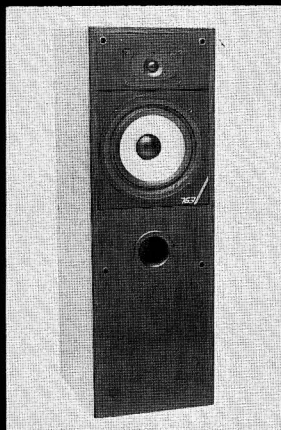
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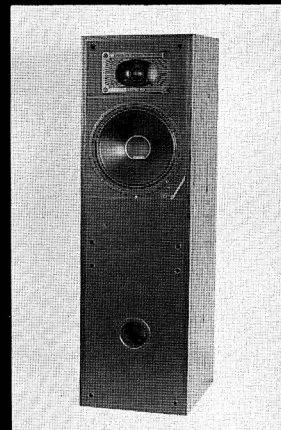
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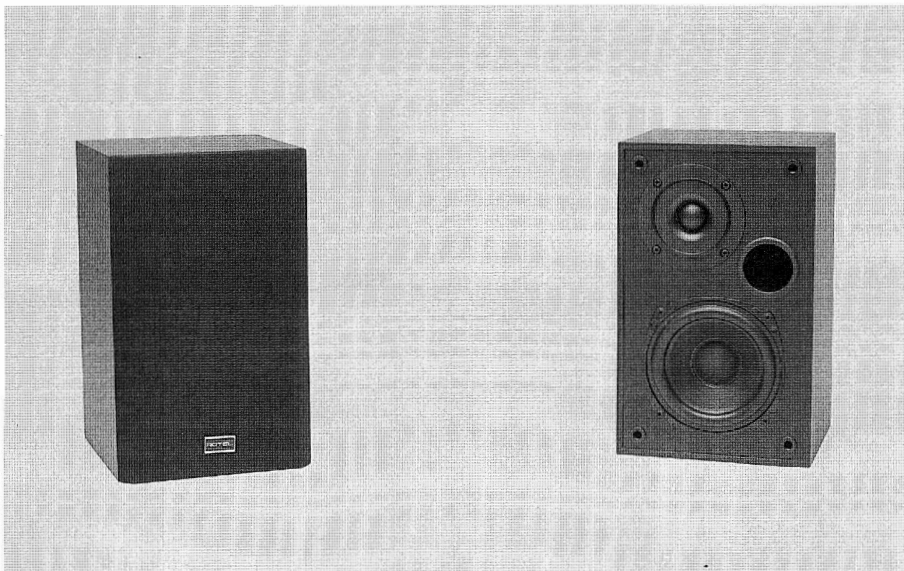
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# ROTEL R810

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Best known for a very successful range of amplifiers and other electronics which combine UK design expertise with Far Eastern manufacture, Rotel has long had a speaker or two in its catalogue to complete the full range line-up, built on the company's behalf by the highly experienced UK OEM industry that supplies midi system partners to most of the major Japanese names.

The *RL810* is a miniature reflex-loaded design selling at the highly competitive £99 'entry level' price point. It's therefore expected to be pretty standard stuff, so it's a pleasant surprise to find a nice cast chassis gracing the Peerless main driver – a tiny unit with a 90mm paper cone and thick roll surround. This couples to a largish (25mm) soft dome tweeter via a fairly simple hardwired crossover network.

Another nice touch is the rebating of the driver frames, though this leaves little purchase for the wood screw fixing, preventing proper tightening up. The box and baffle are only 13mm chipboard after all, so there's not much left after the routing. Such slim sides should not pose a problem here, since the enclosure is vented through a port between bass and treble.

It's only really let down by the nasty spring-loaded terminals, which are just a little too small to accommodate 4mm plugs. And the grille, which is the sort of thing that really shouldn't be allowed anywhere near a loudspeaker that runs to rebated drivers. The tweeter is slightly offset to stagger the effect of baffle edge discontinuities, but no attempt has been made to do the job properly by mirror-imaging the two samples of the pair. However, the speaker itself is so small, the slight lateral differences are likely to be inconsequential.

## TEST REPORT

The tiny cabinet and main driver impose significant constraints on bass extension, sensi-

tivity, power handling and loudness capability – but at least the impedance is kind enough to suit the sort of budget amplification which is a likely partner.

The response trends show the sort of unevenness that one would expect to find in a loudspeaker at this price level. Most obvious characteristic is a little too much strength in the upper bass, and a downward 'step' from mid to treble through the crossover region. Wall siting usefully boosts the 50-100Hz octave, but rather less usefully the band 100-180Hz as well, since this broadens the mid-bass boost. There is also increased unevenness through the crossover region, but on balance wall assistance looks favourite.

The measurements confirm the discard theory of grille management, since this adds a 2dB suckout 6-8Hz – halfway along an otherwise smooth, if rising treble response. Off-axis traces suggest the speaker should be sited at about ear level. The lateral driver asymmetry is inconsequential below 9kHz, causing a 2dB pair match thereafter.

## SOUND QUALITY

Unlike at least two other low cost miniatures included in this report, the *R810* was not much of a success with the listening panel. Real bass extension is notable for its absence, while what there is a little detached and uneven. Coloration is largely restricted to some mid 'boxiness' and there was some praise for the quality of the image – depth in particular – by wall-mount standards.

Upper bass, presence and the mid treble are all a little 'exposed', and this helped contribute to a quite lively and engaging sound, at any rate on first acquaintance. But complex material tends to become a little muddily, and ultimately, the sound lacks substance – the sense of power and authority which does much to suspend disbelief in the equipment, and consequently help the

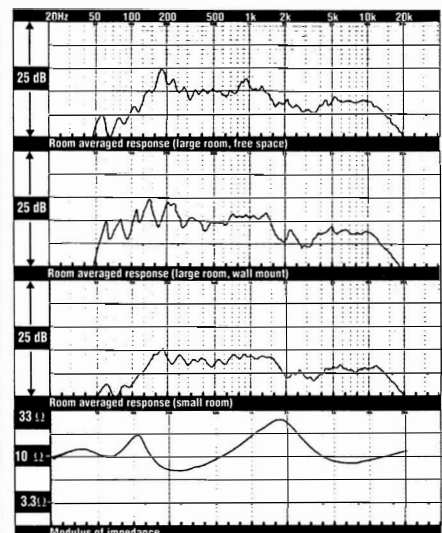
listener get past the sound and into the music.

## CONCLUSIONS

This is not a bad loudspeaker, and could well fulfil its role amply on the end of a reasonably undemanding system. But the £100 price point is the most fiercely contested of all, and the *R10* does seem to fall a little short of the standards set by some of its rivals, losing out not only in a lack of 'solidity' in the sound, but in bass extension and sensitivity as well. It's all a bit uninteresting and forgettable.

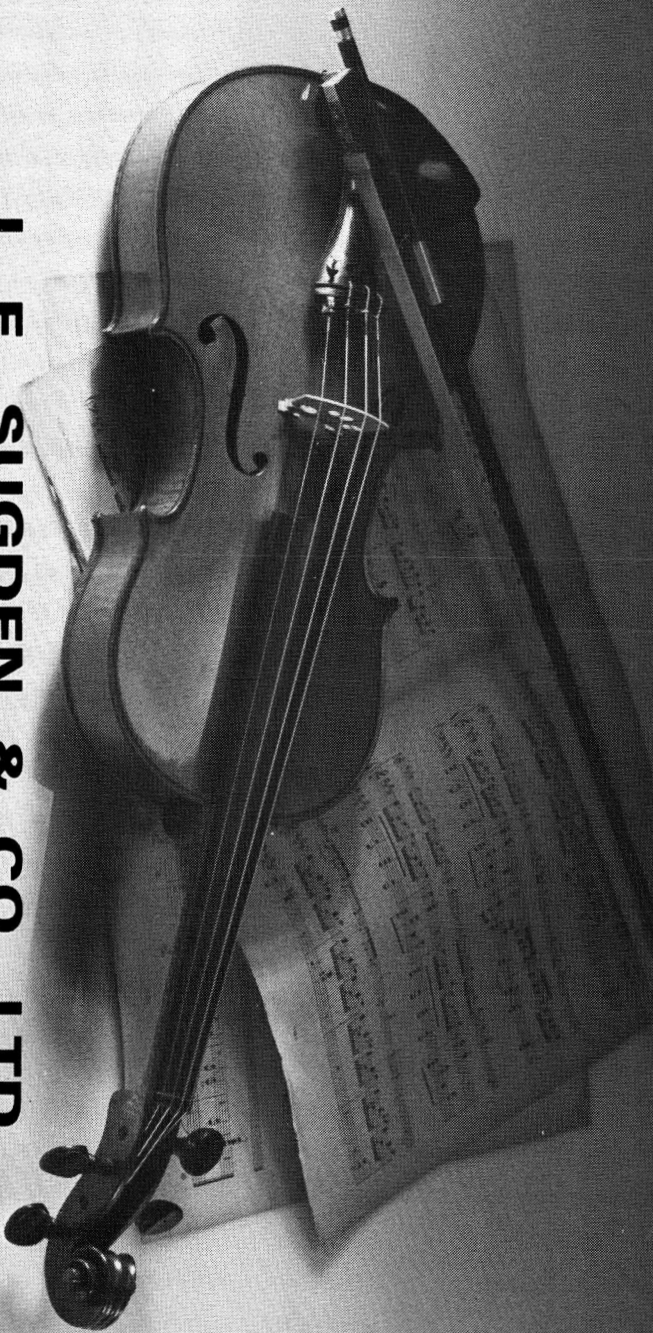
## TEST RESULTS

Size (height x width x depth)	30 x 18 x 17.5cm
Recommended amplifier power	20–60 watts
Recommended placement	on stands near rear wall
In room averaged response limits 50Hz–10kHz	±5dB
Large room/space LF rolloff (–6dB ref midband)	60Hz
Large room/wall LF rolloff (–6dB ref midband)	52Hz
Small room LF rolloff (–6dB ref midband)	60Hz
Large room output at 20Hz (ref midband)	–30+dB (est)
Estimated midrange sensitivity (ref 2.83v, 1m)	83dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	good
Typical price per pair (inc VAT)	£99



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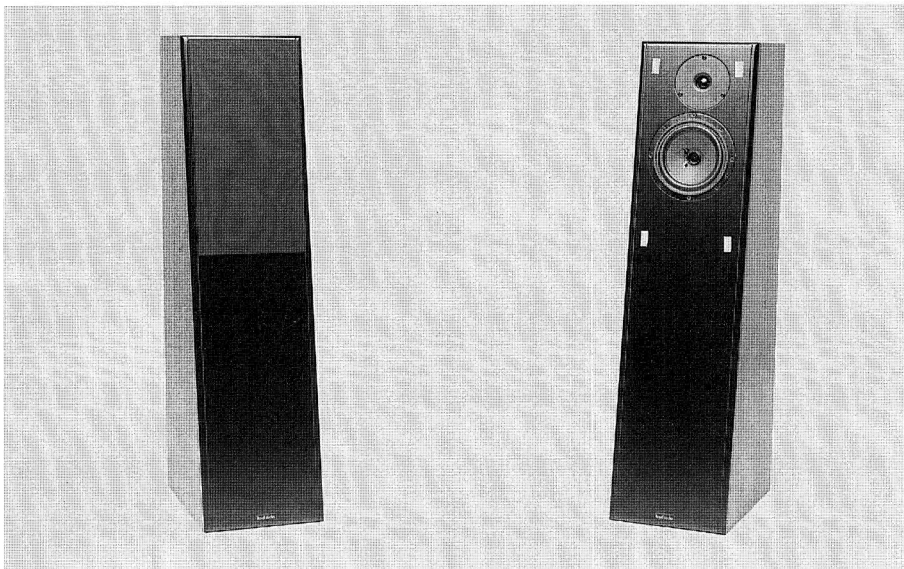
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Royd is a classic example of the small British loudspeaker company whose products reflect the personal vision of one engineer. For many years Joe Akroyd's company concentrated on fairly conventional, good value two-way boxes selling at around £100 or so. Then came the anything-but-conventional *Eden* (*Choice*: June '89) a £240 miniature that is threatening to become a cult amongst *cognoscenti* who welcome (or tolerate) its idiosyncracies for some very real strengths.

The heart of the *Eden* is a rather unusual bass/mid driver based on a very strong cast basket, a very light, small paper cone, and a tiny 1.5cm voice coil. This same driver (albeit a significantly different version thereof) forms the basis of the much larger £485 *Apex* which is the subject of this review. However, in place of the small reflex box with mass damped panels, *Apex* uses a so called 'transmission line' form of bass loading.

Students of hi-fi will note the close similarity between the *Apex* and a new loudspeaker from turntable specialist Rega (*Choice*: *Personal Messages* October '89). This is no accident. Rega has worked with transmission lines for many years, and was much impressed by the *Eden* driver, so in a sense one company contributed the driver, the other the enclosure. However, the two models are by no means identical, subsequent development and production engineering introducing considerable detail variation.

A transmission line operates something like a cross between a reflex and a tuned column. Behind the drivers a vertical partition divides the enclosure into a 'line' twice the length of the enclosure height, the objects being to damp the fundamental resonance of the main driver and augment the bass output at low frequencies. The small bass/mid unit used here means *Apex* can get away with a shorter line of smaller cross sectional area than the behemoth models of old

(IMF et al). One wouldn't call it a small speaker, but it's attractively slim, tapers backwards towards the top, and takes up little more room space than a bookshelf model sitting on a stand.

The wrap is real wood, the front and back smartly finished in black, and the little grille is fixed (I prised one off an *Eden* once, and still haven't managed to get it to stay back in place). The cabinet is fixed to a spiked frame 'stand', which increases the footprint but also somehow makes the whole thing look a little ungainly. A generously specified and quite complex crossover is fitted within the stand, with flying leads to the cabinet proper – visually clumsy, it permits ultimate four-way drive mode flexibility: passive, bi-wire, bi-amp or active.

## TEST REPORT

Considering its main driver is so small, the *Apex* does well to manage an average sensitivity without having to make life difficult for the amplifier with a low impedance. The transmission line is making a healthy contribution too, as comparison of *Apex* and *Eden* shows: specifically, it adds at least 5 and as much as 10dB to the output at all frequencies below 150Hz, though it also introduces some phase difficulties which makes siting quite critical.

The responses show a fair amount of unevenness and an overall mid bias. Against the wall, the mid becomes less lumpy and the range 40-200Hz is filled in to a useful extent, though the 'forwardness' around 1-1.5kHz remains a barrier to genuine neutrality. The new tweeter also provides a better balanced treble than the *Eden*.

## SOUND QUALITY

Where the *Eden*'s lack of bass and forward mid had unsettled and worried members of the listening panel, the *Apex*'s much better balance immediately won them over, enabl-

ing its other virtues of fine midband dynamics, speed and clarity to be appreciated properly. Not generous, power handling is nevertheless adequate for respectable loudness to be achieved.

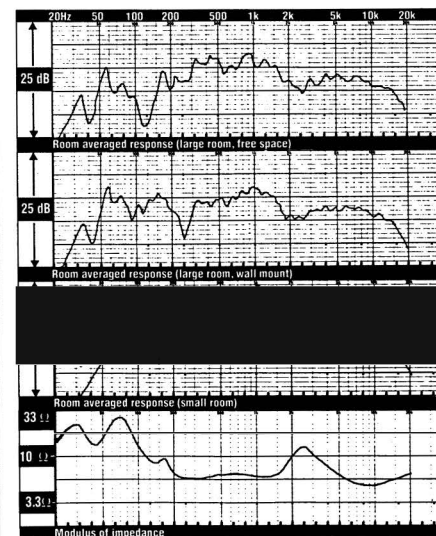
It's not a tidy sounding loudspeaker, and wall-mount LF reinforcement with its attendant coloration is essential to achieve proper balance. But despite a few rough edges, the *Apex* comes through strongly, bouncing along enthusiastically with generous scale, 'real' dynamics, fine clarity and tension. Lots of information comes through from the recording, and this in turn makes listening a more rewarding experience, despite the occasionally strange effect the *Apex* has upon the cosmetics of the sound itself.

## CONCLUSIONS

I'm tempted to break with tradition (or maybe just catch up with inflation) by sticking a Best Buy flag on this clever compact transmission-line Royd, but I guess £485 is a good bit more than many are willing to spend on their loudspeakers. The *Apex* is far from perfect, to be sure, and still has more than its fair share of idiosyncracies. But its simple superiority at bringing listener and music closer together is more than sufficient justification for enthusiastic Recommendation, especially for vinyl enthusiasts with decent quality ancillaries.

## TEST RESULTS

Size (height x width x depth)	85.5 x 20 x 30cm
Recommended amplifier power	15-70 watts
Recommended placement	on floor close to wall
In room averaged response limits 50Hz-10kHz	±7dB
Large room/space LF rolloff (-6dB ref midband)	35Hz
Large room/wall LF rolloff (-6dB ref midband)	30Hz
Small room LF rolloff (-6dB ref midband)	42Hz
Large room output at 20Hz (ref midband)	-20dB (est)
Estimated midrange sensitivity (ref 2.83v, 1m)	87dB
Impedance characteristic (ease of drive)	good
Forward response uniformity	good
Typical price per pair (inc VAT)	£485





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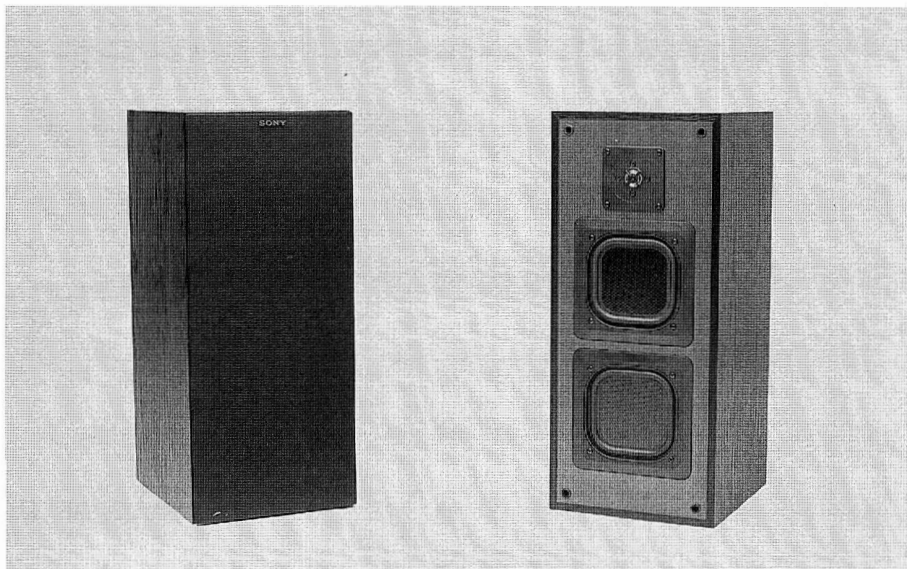
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# SONY APM-141ES

SONY UK LTD., SONY HOUSE, SOUTH STREET, STAINES, MIDDLESEX. TEL: (0784) 467000.

RECOMMENDED



Although most of Sony's hi-fi electronics are still sourced in Japan and the Far East, the loudspeaker side of things is very much a European operation, and Sony is one of the leading players in this game (see *Choice* October '89 pp36). The latest range was introduced a few months ago, the *APM 101ES* and *181ES* models coming under scrutiny in our last Loudspeakers edition (June '89). The £200 *141ES* covered here splits the difference in size and price, while a fourth as yet untested *121ES* model in turn splits the *101* and *141*.

It's a very generous size box for the price, and although it looks like a full three-way system, in fact it's what's often known as a '2½-way'. It uses three drivers, but both 'bass' and 'mid' units are superficially identical, the one immediately beneath the tweeter acting as a bass/mid driver, while the lower one only operates to help out with the lower end of the bass, with further assistance here from a rear mounted port.

Both bass and mid drivers have apparently identical flat square *APM*-style drivers, so from a perceived value point of view, this is a great deal of loudspeaker for the money. However, although the 2½-way concept sounds very attractive in theory, it's a configuration which has proved historically difficult to put effectively into practice. Probably because it inherits many of the problems that have all but caused the extinction of the three-way as a genuine commercial force over the past decade – extra electrical, mechanical and acoustical complexity, plus a large cabinet to get under control.

The box here is nicely finished in black vinyl woodgrain for the wrap, plus textured back and baffle, the latter in an attractive grey with fluted patterning. It's built up from 18mm chipboard, and the baffle is somewhat stiffened by three stuck-on cross-brace battens, though these don't key into the sides. The main drivers are neatly rebated, a

moulded plastic trim providing the final aesthetic and acoustic integration. The grille looks pretty innocuous, visually and acoustically.

Reasonably tough wood screws were done up nice and tight, those for the main drivers clamping down through the trim moulding. The drivers themselves have Sony's proprietary *APM* honeycomb diaphragm, but it looks a bit of a cosmetic exercise as these are mounted as faceplates across fairly conventional paper cone units (more or less). It's an arrangement which provides good stiffness and eliminates the cavity within a normal driver cone, but at the expense of some complexity. Each driver is approximately equivalent to a 120mm cone, while the tweeter is the same 25mm phase-compensated metal dome/annulus used in the *181*. The rear panel PCB crossover is fairly complex, with generously rated components.

## TEST REPORT

The *141*'s decent sensitivity rating has not been achieved by making life difficult for the amplifier, nor by sacrificing one iota of bass extension. Indeed, the latter is fully competitive with models twice or three times the price.

Certainly you get a lot of sound for your pound, but the price is paid in a lack of smoothness, especially a degree of over-richness in the critical 150-200Hz region, some untidiness and a crossover notch in the lower treble, and a rather bright extreme treble (in the German manner). The *141* is clearly better suited to the larger room, and considerable care must be taken in siting if the best results are to be obtained.

## SOUND QUALITY

Two separate presentations left this big Sony treading the average line, liked for its extended, powerful bass but disliked for the lack of smoothness and overall 'loudness'

style contour. Impressive in weight and firm with it, speed and agility are somewhat lacking, though better with open-frame stands.

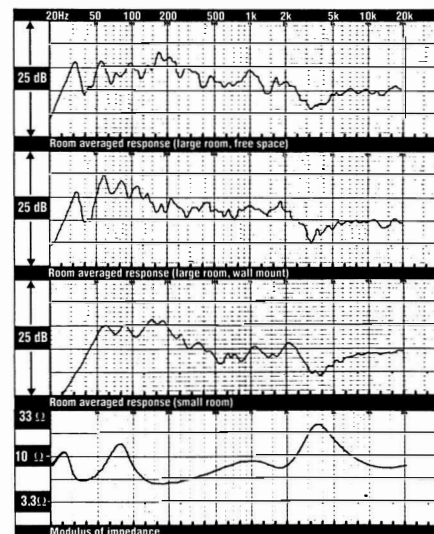
Clear space siting well away from walls is mandatory, but even so the 'plummy' and 'chesty' upper bass strength adds an 'oompah' factor redolent of bierkellar brass bands. The extreme top 'tinkle' tends to be further emphasised by the rather recessed and laid back presence band, the price of such a big scale sound being evident in a general lack of transparency.

## CONCLUSIONS

Superficially the *141ES* looks fine value – a generously proportioned high tech 'three-way' for £200 can't be a bad deal. It's by no means an unsuitable design, but it is an unbalanced one, in both our room measurements and the listening tests, following much the same 'boom'n'tizz' pattern as its larger *181* brother. The net result is about halfway towards leaving the 'loudness' button switched in (on amplifiers that still possess a loudness button), making the whole thing sound rather larger than life. But the combination of good loudness and bass extension, plus pretty respectable overall listening test findings all point towards Recommendation at this highly competitive price, especially for those who want to fill a large room as cost effectively as possible.

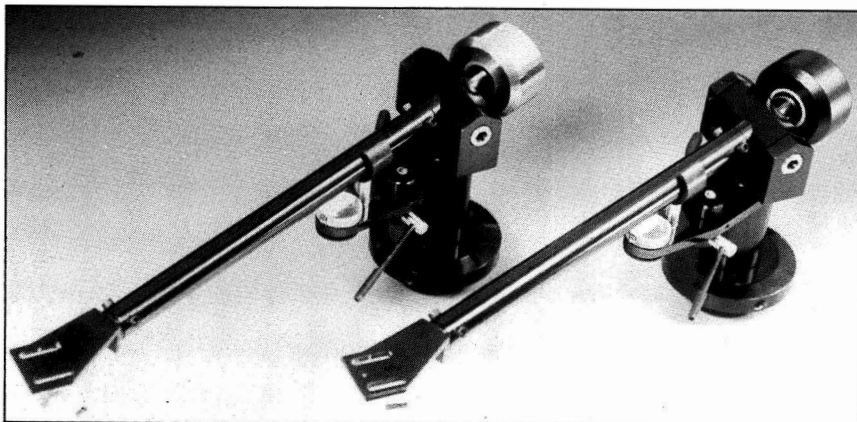
## TEST RESULTS

Size (height x width x depth)	61.5 x 26 x 32cm
Recommended amplifier power	15–150 watts
Recommended placement	large room, medium stand, free space
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)	25Hz
Small room LF rolloff (–6dB ref midband)	40Hz
Large room output at 20Hz (ref midband)	–12dB
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	good
Forward response uniformity	fair
Typical price per pair (inc VAT)	£200



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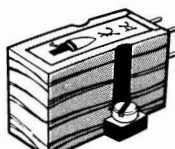
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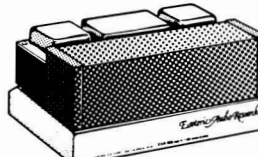
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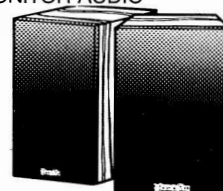
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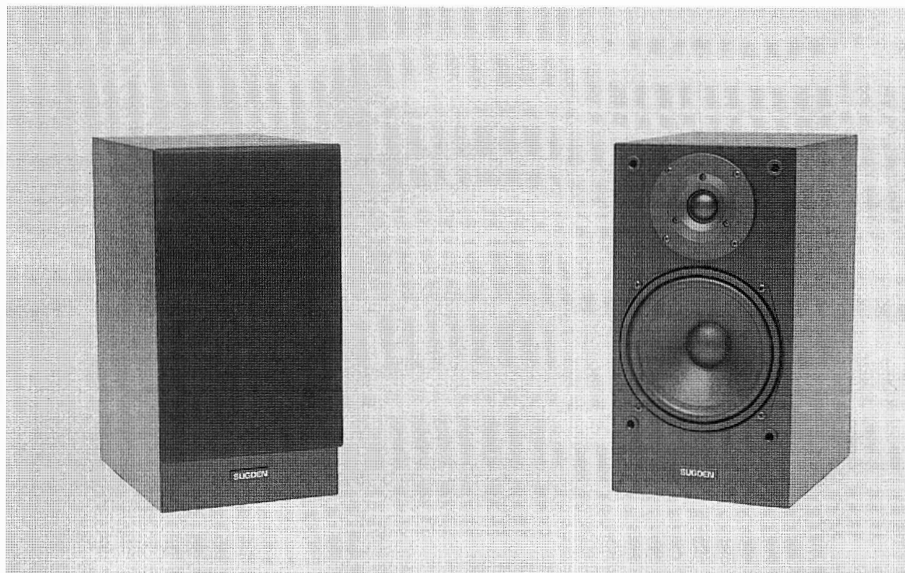


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# SUGDEN CL

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RECOMMENDED



Quite who or what is Audio Synergy I know not, though it sounds a lot less Yorkshire than Heckmondwike, on the edge of the Pudsey/Cleckheaton/Bradford triangle and the widely acknowledged birthplace of British hi-fi. Jim Sugden, on the other hand, was one of the most respected and influential British amplifier designers back in the '60s and '70s, before he sold up to pursue a passion for yachting. His successors have hitherto done much to retain the original traditions, with a small and select range of amplifiers which have their own loyal following, but the introduction of a loudspeaker under the brand is something quite new in my experience.

It's a neat, small and quite heavy 'small bookshelf' model with rear port. The fairly substantial £275 pricetag implies something more than superficial mass production engineering, indicating that the design is aimed at the more discriminating buyer who understands that there is rather more to a loudspeaker than stuffing a couple of drivers into a prettily finished box.

The CL looks purposeful if rather sombre from the outside, cleverly using the smooth finish of the all-MDF cabinet as a styling feature, the whole effect reminding me a little of the 'Pro' look that Acoustic Energy has captured so well (and so successfully). The grille is neat enough too, if a bit on the thick side, the cut-out frame snugly hugging the driver baskets – though it seems a bit of a pity not to leave it off altogether, AE1 style.

The drivers were really tightly screwed home, which is very much the exception rather than the rule, using substantial short pitch screws that bite well into the thick MDF baffle. 18mm MDF for back and sides is also much more generous than most offer, especially for a small reflex-loaded box, and providing some justification for the high price. Further bracing is clearly unnecessary, while the accompanying leaflet proudly

points out that 60/30 joints are used throughout to increase surface/glueing area.

The inside has only light, firm damping material, concentrating on minimising first reflections from the rear panel. A small paper cone bass/mid driver with generous magnet and strong pressed steel frame is linked to the 20mm soft dome tweeter by a fairly complex crossover hardwired inside the rear terminal block.

## TEST REPORT

The spot measurements for bass extension and sensitivity, along with a reasonably modest impedance range all point towards a well balanced package, though the rapid phase angle changes around the LF resonance region do imply that a good quality load tolerant amplifier may be needed to keep a tight grip on the bass end of things.

The overall balance is fine, but the response traces are all rather uneven and lumpy. Partly because the port is still pretty active up here, there's an overall 'richness' centred on 150-200Hz that is likely to play a dominant role. Close to the wall the lumpiness becomes exaggerated, so a distance of 1-2ft is likely to give the best results, with the speaker positioned at ear height. The grille does make a noticeable difference to the measured response, so at least try taking it off.

## SOUND QUALITY

Rated behind only larger and more expensive models, the CL turned in a solid above average performance in the blind listening tests, liked by most and disliked by none. The panel corroborated the manufacturer recommendation for free space siting, while subsequent trials favour an open frame stand rather than a solid type for the most agile bass.

That said, the bass is not particularly agile, and is actually a little rich and 'boxy' even away from walls. But the sound as a

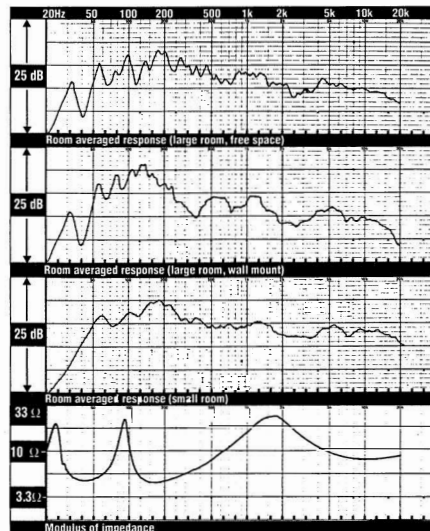
whole is coherent, intrinsically likeable and easy to listen to; detailed and quite dynamic, with fair control. The treble is a shade obvious, but fundamentally sweet with nice string tone and precise imaging. A degree of coloration is audible, but it's fairly generalised and inoffensive, merely compromising transparency somewhat. It's also a good allrounder, well balanced and transparent enough to satisfy classical listeners, yet with the pace and togetherness to please all but a fully paid up headbanger.

## CONCLUSIONS

To my knowledge the first loudspeaker from this famous Yorkshire name, the CL does the brand credit by turning in a thoroughly impressive performance. It's not the easiest load to drive, and is a shade expensive for the size. But the underskin engineering is not skimmed, the cosmetics are attractive, and above all it sounds really nice. So nice in fact (as I write) that I'm half tempted to put a Best Buy flag on the corner, though I guess that simply Recommended is more appropriate to £275.

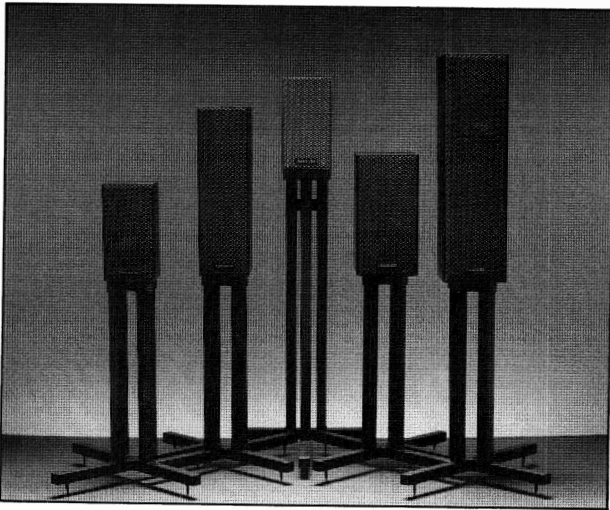
## TEST RESULTS

Size (height x width x depth)	35.5 x 18 x 26.5cm
Recommended amplifier power	15-70 watts
Recommended placement	on high open stands 2+ft from 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
Small room LF rolloff (-6dB ref midband)	40Hz
Large room output at 20Hz (ref midband)	-16dB
Estimated midrange sensitivity (ref 2.83v, 1m)	86dB
Impedance characteristic (ease of drive)	fair
Forward response uniformity	fairly good
Typical price per pair (inc VAT)	£275



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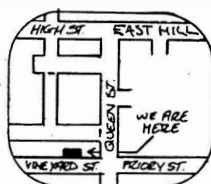
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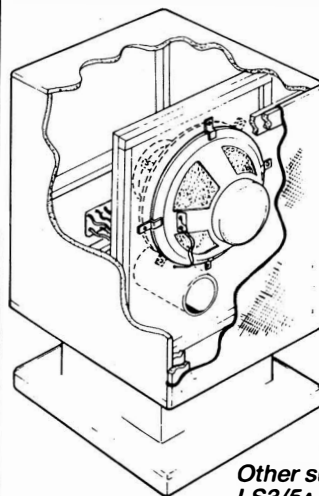
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RECOMMENDED



Although Tannoy is one of the oldest names in loudspeakers, its hi-fi reputation was built on large and expensive designs using the famous dual concentric drivers. More recently it has become an important player in the mainstream volume sector of the market, thanks to the original *Mercury* and its heavenly companions.

The *Mercury* is a conventional enough two-way bookshelf model of about medium size. The configuration has remained the same since its inception, but the detail engineering and styling has been 'tweaked' several times over the past several years. The £170 *M15* is the latest variation in an evolutionary chain that has brought a string of *Choice* 'Best Buy' ratings, in what has always been a fiercely competitive sector of the market. Go back more than three years and the price was still £150, so Tannoy has done a good job in keeping manufacturing costs tight, despite adding 'extras' like bi-wire terminals and metal dome tweeters along the way.

The box is nicely enough presented, with rather more restrained graphics than some previous Tannoys, thanks in part to a change to blue for the logos. Reflex loading takes some of the demands off the cabinetwork, as does a crossbrace which clamps together the mid points of the two 12mm sides, and also tensions the back of the magnet. The baffle is made in heavier 16mm stock, and the units were screwed home fairly tightly. The crossover is a simple low cost device, hardwired behind the double terminal block in a way that permits conventional, bi-wire or (at any rate theoretically) bi-amp connections to be made.

The tweeter is a 25mm naked metal dome – a fact which might deter those with young and inquisitive children, but undoubtedly the 'no-compromise' route. A removable label fixed to the cabinet sensibly warns users to take care. The main driver uses a largish

150mm plastic cone on a pressed steel frame, which is conventional enough, save that the dust-dome in the centre is tucked right down inside the voice coil – clearly another subtle Tannoy tweak, presumably to do with the movement of air around the pole-piece.

## TEST REPORT

The *M15* manages to combine above average sensitivity with a 'kind' impedance characteristic and very respectable bass extension for the box size. The grille has been properly engineered, though some might still prefer to remove it.

Though tolerably smooth and consistent, the response measurements do show some broadband unevenness, with some prominence in the bands 100-200Hz, 1-2kHz and 6-8kHz. The most favourable site looks likely to be about 1-2ft from a rear wall, which is eminently practical for a compromise, while the listening axis is relatively uncritical.

## SOUND QUALITY

As subsequent experimentation showed only too clearly, the *M15* is pretty sensitive to the stand on which it is put, and the manufacturers recommendation for Blu-tack coupling should certainly be followed for best results. Despite non-ideal conditions, it nevertheless delivered a solid above average rating on two separate presentations, which is well in keeping with its illustrious forebears.

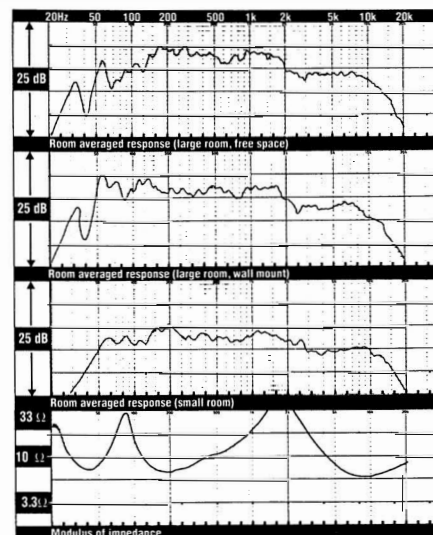
It's clearly rather too thick and heavy against the wall, but loses power and weight whilst remaining slightly 'chesty' when pulled away. That apart, the overall balance is good, though not without some lack of presence and air either side of a slightly obtrusive mid treble, which adds some nasality and 'cuppiness' to the midband. Despite these cosmetic limitations, it shows good rhythmic integrity and speed, keeping faith with the musicians' intended timing, and hence ensuring good listener involvement.

## CONCLUSIONS

I had hoped to avoid the expression in this issue, but I didn't put any money on it so I can go ahead and describe the *M15* as a good allrounder that does nothing particularly badly and most things pretty well. Which is rather impressive for £170 the pair. Build quality is very good, with some nice under-the-skin touches to improve sound quality, so Recommendation is confident. Get everything working just right – as I did once, fleetingly – and the *M15* can really come together and starts to sing, but a measure of uncertainty and unpredictability in system interfacing – getting the right stands, for starters – leaves me reluctant to go so far as a Best Buy.

## TEST RESULTS

Size (height x width x depth)	50 x 25 x 21cm
Recommended amplifier power	15-100 watts
Recommended placement	Blu-tack to stands, 1-2ft from wall
In room averaged response limits 50Hz-10kHz	±6dB
Large room/space LF rolloff (-6dB ref midband)	48Hz
Large room/wall LF rolloff (-6dB ref midband)	30Hz
Small room LF rolloff (-6dB ref midband)	45Hz
Large room output at 20Hz (ref midband)	-17dB
Estimated midrange sensitivity (ref 2.83v, 1m)	88dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	good
Typical price per pair (inc VAT)	£170



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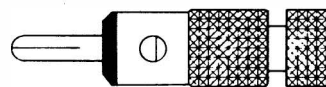
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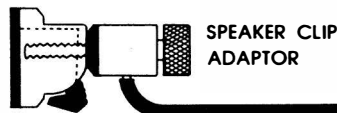
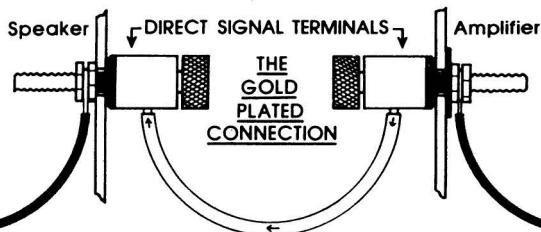
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# TANNOY DC3000

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RECOMMENDED



Tannoy's recently introduced DC series is the latest incarnation of a hi-fi and ProAudio tradition that seemingly goes back to the beginning of time. DC stands for 'dual concentric', referring to a special drive unit design which combines both bass/mid and treble duties on the same chassis. This ensures that midrange and treble (plus at least some of the bass) emanate from the same place in space, which in turn helps the mid-to-treble integration through the crossover region.

For the new 'domestic' DCs, Tannoy engineers have entirely reworked the driver, substantially improving the mechanical performance of the treble section. There are three models (so far), of which the £600 DC3000 is comfortably the largest and most expensive. Both the smaller models have been examined in previous issues, the 2000 performing particularly well.

By today's standards the 3000 is an uncompromisingly large loudspeaker (another Tannoy tradition). It is also very heavy, partly as a result of massive driver magnets. There's no need to add extra for a stand, since spikes can be fixed directly to the base of this monolithic floorstander. All five visible faces are finished in a deeply figured black woodgrain vinyl (or in real coloured wood for an extra £100), so the plastic frame grille is optional.

Even though the box is quite slim, with reflex bass loading, the 19mm chipboard carcass is reinforced by lots of internal bracing. There's also the strong recommendation that the (blanked off) lower cubic foot or so be filled with lead shot (or sand), which we didn't get around to trying. But as the listening progressed it became clear that this rather tweaky mod is likely to be well worth carrying out.

There are two drivers screwed directly to the wood only, each with 160mm main polypropylene cones, the upper the combination DC unit, the lower a simple bass driver. Both

operate in parallel at low frequencies into the lightly damped rear slot port reflex enclosure, providing a 4ohm impedance at LF, rising to 8ohms as the bass unit is rolled off gradually above 200Hz. Double terminals for bi-wire/-amp connection separate out the tweeter, which is as it should be.

## TEST REPORT

The sensitivity rating of 94dB places the DC3000 in a whole different performance ballpark from all the other models assessed in this report. For anyone with the remotest interest in loud music, this one eclipses all others, doubling the effective size of your amplifier – and consequent system 'headroom' – at a stroke. (Users of inherently noisy power or over-sensitive pre-amplifiers should approach with caution.) There's some price to pay in the current-hungry 4ohm impedance characteristic, alongside a bass extension that is adequate rather than sensational for the box size.

The balance is impressive overall, if a little uneven in the fine detail. The upper bass region is a little 'rich' around 100-200Hz, while a little wall assistance (only a little) helps lift the 50-100Hz octave. The high treble is somewhat suppressed, especially off-axis. The small room trace is unusually usable for such a large model. Off-axis traces show the sort of fine coherence for which coaxial drivers are justly famed, the smooth variations here beginning from comparatively low frequencies (c600Hz). Below axis listening is better avoided, which is a pity, as this speaker stands tall.

## SOUND QUALITY

The blind listening test is not the place to unleash such a beast as the DC3000, which survived the experience with honour rather than distinction. Reduced to common denominator loudness with even the miniatures, there is no opportunity to explore the

dynamic headroom, and the inevitable downside of the largish cabinet is manifest in a certain amount of fairly generalised cabinet coloration (some of which would probably be helped by the lead shot treatment). The box seems a shade too keen to join in with the 'cellos, for example, while the presence is also slightly 'thickened'.

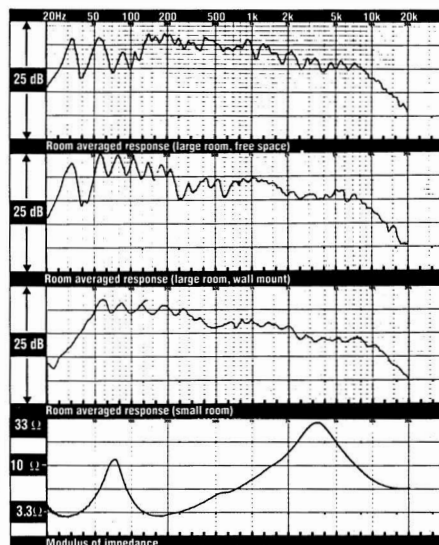
Not unreasonably preferred when sited away from walls, it provides substance and authority in abundance, though transparency and speed could both be improved. Given its head, the true dramatic potential of the fine dynamics and enhanced headroom becomes abundantly clear. By the time normal speakers are starting to struggle, the Tannoy is just getting into its stride, daring you to try and keep on going for as long as it can, or until the neighbours come beating on the door.

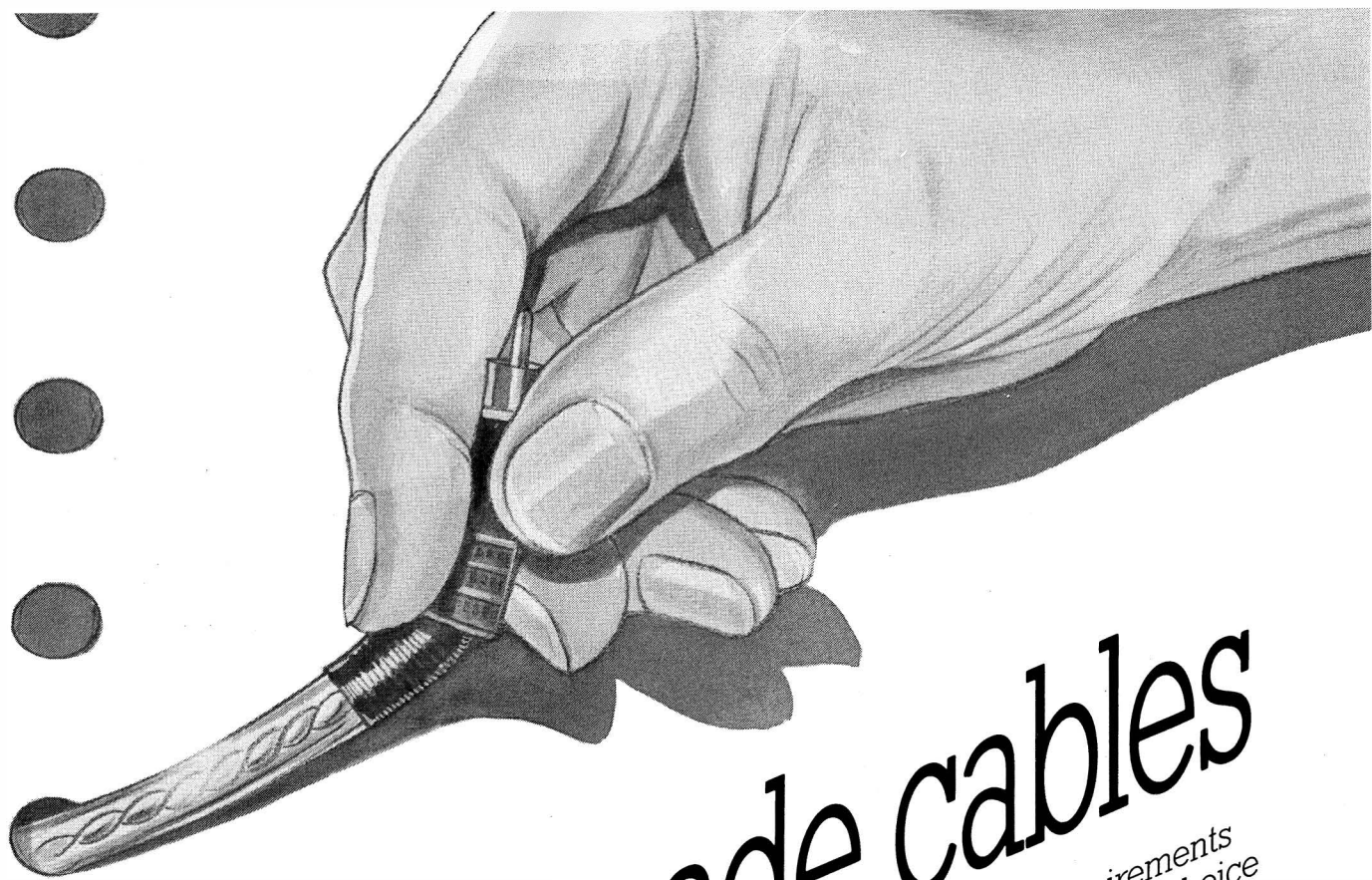
## CONCLUSIONS

£600 seems little enough to pay for the chance to experience hi-fi horizons that bookshelf users never even get to glimpse. Other rival models can – and do – often sound more civil and polite than these magnificent, muscle-bound monoliths, but precious few can approach a degree of dramatic impact that had me searching my record collection with refreshed ears. Recommended with enthusiasm – even without the lead shot.

## TEST RESULTS

Size (height x width x depth)	94 x 26 x 31cm
Recommended amplifier power	10–150 watts
Recommended placement	on floor, at least 1ft from wall
In room averaged response limits 50Hz–10kHz	±6dB
Large room/space LF rolloff (–6dB ref midband)	25Hz
Large room/wall LF rolloff (–6dB ref midband)	25Hz
Small room LF rolloff (–6dB ref midband)	35Hz
Large room output at 20Hz (ref midband)	–10dB
Estimated midrange sensitivity (ref 2.83v, 1m)	94dB
Impedance characteristic (ease of drive)	current hungry
Forward response uniformity	very good
Typical price per pair (inc VAT)	£600





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# TDL STUDIO 1

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RECOMMENDED



Back in the early '70s, a company called IMF made a very successful range of exceedingly large (and expensive) multi-driver loudspeakers. Their particular selling point was a form of bass loading which is (slightly misleadingly) referred to as a 'transmission line'. IMF disappeared a few years ago, through the break-up of the partnership which had originally brought it into being. But realising there was still a healthy latent demand for 'line' loudspeakers, one of the original principals has resurrected and updated much of the original concept under the TDL banner.

Like its historic ancestor the 'labyrinth', the purpose of the 'line' is to absorb the back radiation from the bass driver down a long folded column with carefully placed damping, so as to avoid any reflections or back pressure distorting the raw output of the driver itself. In practice the end of the 'line' is usually left open as a port, so borrowing elements of reflex and tuned column loading in the final application.

We reviewed TDL's 'full size' four-way *Monitor* a year ago, and there is little doubt the concept still offers its own valid aspirations towards the state of the art, with prodigious bass extension and a relaxed, low coloration presentation. But the market is limited for £1,800/pair loudspeakers better suited to the stately than the Barratt home, so the new, compact £550 *Studio 1* model looks a rather more practical proposition – indeed, at the Penta Show, designer John Wright seemed faintly worried that it might start to undermine his more expensive models.

In driver terms the *Studio 1* is a fairly standard two-way package. Bass and mid-range duties are handled by an Elac unit with 125mm plastic cone and wide surround. The tweeter is the familiar and popular 25mm Elac metal dome device. The drivers are bolted firmly to T-nuts, while the baffle is generous 18mm MDF. The sides are 14mm

veneered stock with bituminous damping pads, while the line itself adds comprehensive bracing – especially in this case where there are two partitions and the line is more than twice the cabinet height in length. The crossover is a fairly simple PCB affair.

In volume terms the *Studio 1* is no bigger than a couple of large bookshelf models, or just the one sitting on a high stand. A little matching stand costs an extravagant extra £75, lifts the speaker a few inches off the deck and spike couples to the floor. Cosmetically there's some room for improvement, as only the top and sides are veneered, neither back nor front are particularly pretty, and the grille has a thick wooden frame (with some chamfering). Two pairs of chunky gold plated terminals provide bi-wire/-amp alternatives to normal passive operation.

## TEST REPORT

Sensitivity is a couple of dB below average, having been sacrificed in the interests of exceptional bass extension for the box size. The impedance is kind, but a powerful amplifier is needed to benefit from the good power handling and extract high listening levels.

While the overall balance is quite impressively flat, there is quite a lot of unevenness through most of the bass and midrange. Those below 500Hz have much to do with the room and the transmission line/driver/floor interactions, but the design clearly benefits best from free space siting in the larger room – small rooms or nearby walls risk causing bass boom. The prominences 600Hz-1kHz and 6-9kHz are likely to be audible as colorations. Off-axis traces indicate that the listening axis is fairly uncritical.

## SOUND QUALITY

The TDL proved quite a hit with the listening panel, who relished the generously extended bass and good clarity, despite criticising the rather 'lazy' and 'laid back' presentation.

Clearly best when well clear of walls, it's capable of generating the sort of scale, control and stereo soundstage which is most easily appreciated on orchestral music, while the overall balance and inherent qualities seem to work better with CD than vinyl sources.

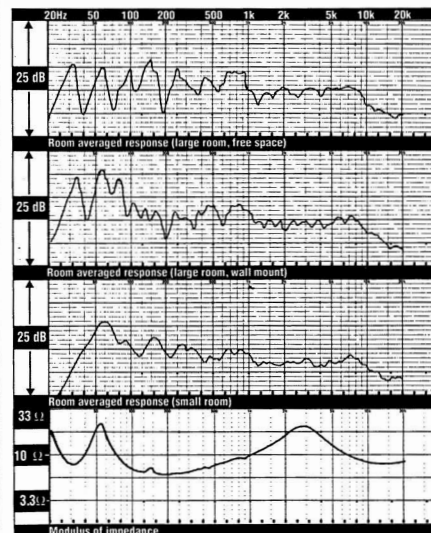
There's a certain amount of obvious though not severe coloration which is probably associated with the rather 'lumpy' response. The presence dip and mid treble recovery was very accurately identified by panelists, and some felt that the low bass was somehow 'dissociated' from the rest of the sound.

## CONCLUSIONS

The transmission line principle has always had much to offer, especially now that sources are less prone to generating LF garbage, yet the opportunity to create compact 'lines' based on simple two-way driver systems has never really been exploited to date. The *Studio 1* is one of two such models in this edition which look set to plug the gap. Better suited to those of a classical/CD persuasion, it may be warmly Recommended for anyone wishing to get some real bass extension into their systems while avoiding breaking the bank balance or filling up the room with loudspeaker.

## TEST RESULTS

Size (height x width x depth)	76 x 23 x 33cm
Recommended amplifier power	20–100 watts
Recommended placement	on low stands in free space
In room averaged response limits 50Hz–10kHz	±6dB
Large room/space LF rolloff (–6dB ref midband)	22Hz
Large room/wall LF rolloff (–6dB ref midband)	22Hz
Small room LF rolloff (–6dB ref midband)	33Hz
Large room output at 20Hz (ref midband)	–8dB
Estimated midrange sensitivity (ref 2.83v, 1m)	84dB
Impedance characteristic (ease of drive)	very good
Forward response uniformity	fairly good
Typical price per pair (inc VAT)	£549



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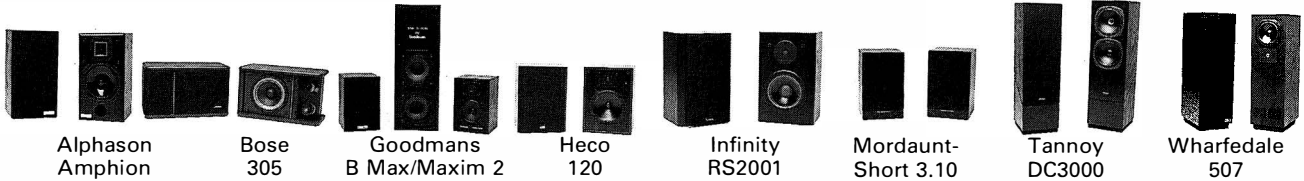
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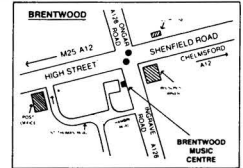
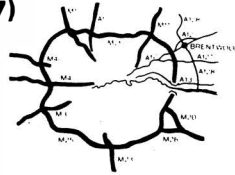
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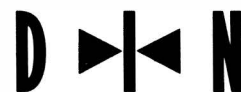


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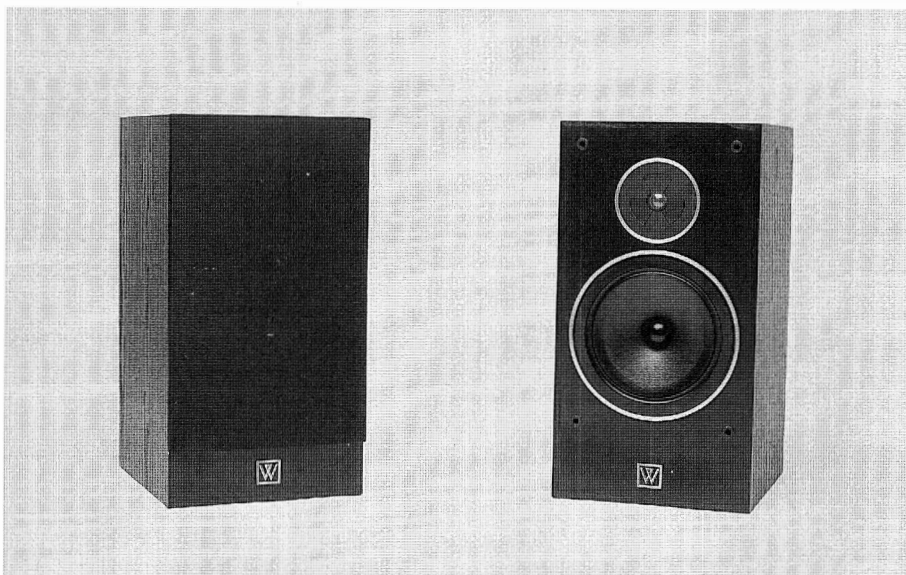
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# WHARFEDALE 507

WHARFEDALE LOUDSPEAKERS LTD., SANDLEAS WAY, CROSSGATES, LEEDS LS15 8AL. TEL: (0532) 601222.



Wharfedale is the best known brand in British hi-fi, at least as far as the man on the top of the Clapham omnibus is concerned, though the brand has had something of a trying time in the '80s, changing hands several times in rapid succession. However, the latest buy-out looks to have brought back both stability and a measure of success, via such models as the 505.2 which received a Best Buy rating in our January '89 Loudspeakers edition.

The \$219 507 is one step up from the 505.2, and the family resemblance is close, at least in terms of construction techniques and driver technology, though this one's a reflex not a sealed box. It's quite large, a rather tubby appearance accentuated by a grille which stops short of the bottom to reveal the company logo. The grille is a truly wretched affair from an acoustic point of view, as became all too clear later on; the thick wooden frame even makes conversion into a fly swat impractical. Fortunately the naked baffle is nicely enough presented, a separate cover protecting the tweeter dome.

Black woodgrain vinyl decorates the wrap, picture-framing the textured black baffle. A generous port tube with foam damping is set into the rear panel, which itself is recessed by an inch in order to stiffen everything up, leaving a certain amount of raw painted chipboard visible from the back, which is rather a pity as this is not a back-against-the-wall design.

The drivers are mounted using Wharfedale's proprietary bayonet fixing system, so I was unable to gain entry to the enclosure to find out what is going on under the skin. The drivers themselves consist of a small 19mm metal dome tweeter, plus a quite large bass/mid driver, with a 155mm cone which appears to be made in a textured plastic. The wrap is built from fairly light 14mm board, the knock test suggesting there is little in the way of damping or bracing inside.

## TEST REPORT

The generous size box delivers pretty respectable bass extension in-room, with slightly below average sensitivity and an easy amplifier drive characteristic. The overall balance is rather uneven, albeit within fairly good overall limits, and is slightly 'mid forward' with a rather depressed presence region.

The port activity centres on 80Hz and the upper bass looks a little uneven, so careful placement and just a little wall assistance will probably be beneficial in optimising the balance. The response smooths out a little with the grille removed, while the best balance is found directly on axis – try angling them inwards, and use stands high enough to avoid above-axis listening.

## SOUND QUALITY

After the success of the 505.2, the disappointing results obtained for the 507 on the first day of listening tests were something of a surprise. Moreover, a later presentation only served to reinforce these original findings. Subsequent hands on experimentation revealed that the grille had done nothing to further its loudspeaker's cause; removal immediately helped to 'open out' the mid-range and reduce the 'boxy', 'thick' quality to a worthwhile degree. A further improvement was found when using lighter open-frame stands in place of the heavyweight pillars used for the blind test, though this improvement was less dramatic.

But neither of these changes is sufficient to rescue this particular Wharfedale from mediocrity. The panel was not so much offended as consistently underwhelmed, by a rather 'muddled' sound that was bassy without brio, and which lacked transparency and 'air'. Wall siting is a little 'heavy', but free space is a shade light in weight. Coloration is widespread, if not especially severe in any

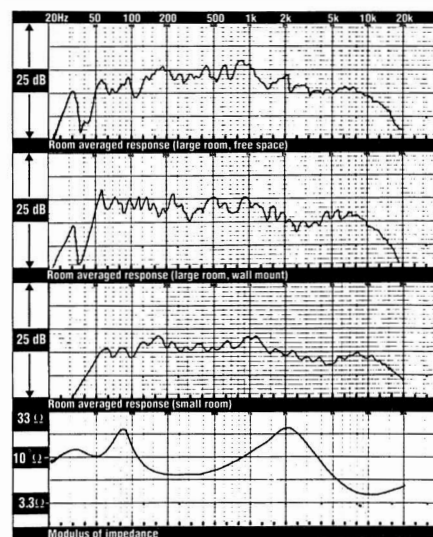
particular part of the band, and the end result is rather woolly and congested. As one panelist summed up: "I think you'd end up having a conversation instead of listening."

## CONCLUSIONS

Quite why the 507 should be as indifferent as the 505.2 is special remains a mystery to me. Perhaps it's to do with one being an 18mm sealed box; the other a 14mm reflex. Certainly the 507 can't quite make up its mind whether to stand away from or snuggle up against the wall, and this indecision seems to be carried through into the sound. Furthermore, I don't think anyone should sell a \$200+ loudspeaker with a grille as bad as this.

## TEST RESULTS

Size (height x width x depth)	49 x 25.5 x 29.5cm
Recommended amplifier power	20–70 watts
Recommended placement	on high stands 1ft + from wall
In room averaged response limits 50Hz–10kHz	± 5dB
Large room/space LF rolloff (–6dB ref midband)	30Hz
Large room/wall LF rolloff (–6dB ref midband)	28Hz
Small room LF rolloff (–6dB ref midband)	40Hz
Large room output at 20Hz (ref midband)	–18dB
Estimated midrange sensitivity (ref 2.83v, 1m)	86dB
Impedance characteristic (ease of drive)	fairly good
Forward response uniformity	fairly good
Typical price per pair (inc VAT)	£219



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# LOUDSPEAKERS: CONCLUSIONS, BEST BUYS AND RECOMMENDATIONS

*Paul Messenger explains our review procedure and sums up the better boxes in this month's bunch.*

## BACKGROUND LISTENING

The 'blind' tests took four days with about five listeners, making up more than 40 separate presentations of about half an hour each. Split evenly between vinyl and compact disc, the programme provided as broad a range of music as possible. Care was 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.

Choice of ancillary components inevitably influences the type of sound, possibly by as much as the room itself, and is one potential source of prejudice I know no way of avoiding. The main drive system comprised Naim amplification and cables with Linn *Sondek/Troika*/Naim *ARO* vinyl disc and Marantz *CD85* CD player sources. Grilles were deliberately left on, and to avoid introducing another variable we decided not to bi-wire (or for that matter bi- or even tri-amp). Again for the sake of consistency, the speakers were auditioned both sited against a rear wall and out in free space.

Save for the floorstanding models and one or two which had been specifically supplied with matching stands, all were used on (45cm) *NVA Cube* and (58cm) *Celestion 700* stands, both heavy pillar types. Heybrook *HBS1* and Linn *Kan* open frame stands were extensively used for corroboration during subsequent hands-on listening.

My particular thanks go to Jason Kennedy for all his hard work as operator on the blind listening tests; to the panelists who gave up their time: John Bamford (*Hi-Fi Choice*), David Inman (KEF), Richard Dunn (NVA), Alex Garner (Tannoy), Peter Wanstall (JPW), Richard Allen (Celestion), John Honeyball and Phil Ward; and to Roksan, for loan of a Bryston pre-/power amplifier, and NVA for various equipment.

## MEASUREMENTS

The main change from before has been to focus exclusively on room-averaged response traces for the published data, partly for convenience but also because this measurement consistently delivers the most accurate listening test correlation. As guidance to finding the best balance, this has been plotted for both wall and free space siting; intermediate positions produce more or less intermediate results.

A perfectly flat straight line is not the 'target'. Careful comparison with listening findings and established references suggest the ideal 'large room' balance should be a flat and straight line up to around 1-2kHz, followed by a gentle but steadily increasing downtilt through c-5dB at 5kHz to c-10dB at 20kHz. Low frequencies are heavily modified by the main room modes – c10dB boost at 30Hz (or 10dB suck out at 42Hz if your prefer). For the rest, even the smooth variations are better than sharp discontinuities.

The speaker and microphone sites parallel the listening tests, giving a measuring distance of 3-4m, the sparsely furnished room itself being 4.5 x 5.5m plus large bay. An extra trace was also taken in a second room about half the size, the speakers sited about 20cms from the wall and measured at 2-2.5m. Additional nearfield measurements examined the influence of grilles, ports and axis variations.

All the room traces were taken at the same volume control setting and calibrated against a 2.83V 1m on-axis anechoic trace to provide a measure of sensitivity, relating primarily to the main vocal fundamental range 150-500Hz. The 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 and the

speaker sucks twice the current and therefore twice the power for the same volume setting. By adopting 4ohms rather than 8ohms impedance, 'current hungry' loudspeakers therefore 'pinch' 3dB of extra sensitivity. Few amplifiers have the capability to deliver this extra 3dB in full, most settling for 1.5-2dB, so an apparent sensitivity difference may well be partly negated in practice.

## CONCLUSIONS

This latest 31 pairs of loudspeakers show similarities but also differences from previous test groups. The miniatures have again done well in spite of their size and price constraints, but so have several larger floorstanding enclosures on this occasion. The 'middle ground' models seem to have underperformed somewhat by comparison.

Having recently covered a batch of ten miniatures, most of which left me scratching around in a vain search for any real virtue, it's rather a paradox to find two out of the three included here doing so well – in much the way that the JPW *Sonata*, KEF *C15* and Sony *APM-101ES* did in last June's 30-strong test.

Superficially this suggests some inconsistency in our evaluation, if only on statistical grounds, but I don't believe this is really the case, and am sticking to the theory that the better miniatures just chanced their way into the bigger group tests.

If the 'middle ground' was a little disappointing taken as a whole, then it was also mildly disconcerting, because of the difficulty of ensuring optimum performance through choice of stands. Anyone who has played around with loudspeakers knows that stands do play an important role in the total sound. So too do rooms and floors of course, but there you don't get much option . . .

Despite foreknowledge, I was still surprised how much

difference changing the stands could effect, and so ended up doing extensive comparisons across a range of four tolerably representative types and ringing the changes between spike and damped coupling to give everyone a fair chance. Middle sized boxes like the Mordaunt-Short *MS3.30* and Tannoy *M15* seem much more sensitive to stand differences than the miniatures, presumably because of their larger and more energetic boxes, though attempting to predict cause and effect is very hazardous. The First Law of Real Hi-fi clearly states: "There are no rules" – a maxim that could have been drafted with speaker stands in mind.

Tending to reinforce this unease, a number of mid-price (£500-£600) floorstanding models came through very strongly. There were several good ones in this general price region last time around too, so much so that this looks like becoming the most interesting and competitive sector of the marketplace, combining good performance with considerable variation and a wide range of choice.

Eschewing stands for direct-to-floor coupling certainly makes the floor interface a little less unpredictable, but in practice these models have the still more difficult task of controlling a lot more cabinet area, not to mention greater difficulties in exciting the floor itself. A much more likely reason why these larger models are succeeding is that most have abandoned the formal three-way configuration with dedicated midrange driver that was for so long regarded as the 'right' way to do this sort of loudspeaker.

Four of the five most successful on this occasion all use the same driver for bass and mid duties, just like the little boxes, but use different devices to reinforce the bottom end and provide the sort of scale and extension which managed to get



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the listening panel interested. Two have transmission lines, the solitary three-way uses a coupled cavity, and the other two add extra drivers solely to augment the bass end – sometimes called '2½-ways'. All have devoted considerable design effort to the cabinetwork, acknowledging that this is usually the limiting factor in large loudspeakers.

It's interesting to see the re-emergence of transmission line bass loading, in eminently practical (comparatively) compact formats, based on two-way driver systems, and also the resurgence in interest in dual concentric drivers. However, the most important long term technical trend here might well prove to be the emergence of structural plastics, used for both baffle and trim in the new Mordaunt-Short models. It has been done before, especially for in-car speakers, but never to my knowledge for mainstream, popularly priced loudspeakers aimed at the domestic hi-fi market.

## BEST BUYS, RECOMMENDATIONS AND 'WORTH CONSIDERING'S'

Much as usual, 12 models have selected themselves for Recommendation from the total of 31. There's only one Best Buy this time, but several other models well worth serious consideration are also included in this round-up.

It's also worth pointing out that comparatively few modern loudspeakers fall firmly into the 'unacceptable' category. Our judgements have to be based on evaluating each model on a large number of sometimes contradictory parameters, and as I've mentioned countless times before, the sound of a specific loudspeaker will vary significantly according to the drive system, the room and placement (and stand). Hopefully our listings are the most reliable guide around, but they're no substitute for taking the time and trouble to search out a dealer skilled enough to find what it is about music that turns you on, and help you choose the equipment best suited to that task.

Starting near the bottom of the price ladder, the brand new £99 **Mordaunt-Short MS3.10** is this issue's Best Buy. I was struck by the similarity between this model and an ongoing *Choice* favourite, Goodmans' *Maxim 2*, so it was rather gratifying to discover that one individual had a key role in both designs. The very prettily styled *3.10* is delightfully lively

and informative if a bit pushy and aggressive with it, that is also capable of responding very positively and with some gusto to high quality signals.

A close rival in many respects, the smart £109 **Celestion 3** has already picked up a string of rave reviews elsewhere, and is an established best seller. Our strong Recommendation stops just short of the BB accolade because it is a little short of dynamics and 'speed', and the bass tends to clog a little when driven hard. But the wall balance and stereo are excellent, and the *3* is more likely to prove tolerant of inadequacies in the replay chain (eg compact disc) than the *3.10*.

Not formally Recommended, the £139 **Heybrook Point 5** is nonetheless worth considering for its good dynamics and wall-mount balance, plus a very pretty box, though the sound is a little rough around the edges.

The new version of an established *Choice* Best Buy, the £169 **Infinity RS2001** is presumably a victim of exchange rate fluctuations, the £40 increase over its predecessor being sufficient to drop the rating to Recommended this time around. It remains an exciting, lively and dynamic 'bookshelf' size wall mount, hampered by some mid colour and a slightly unruly treble.

Another slippage from Best Buy to Recommended, the latest £170 **Tannoy Mercury M15** gets close to being most things to most men, with a generous, attractively finished enclosure and a surprising number of luxury touches at the price. Extracting its full potential, however, requires some care and patience.

This is even more the case with the £180 **Mordaunt-Short MS3.30**, the 'middy' balance certainly creating too much coloration for many tastes, but

the attractive 'bounce', speed and dynamic integrity more than justify its consideration.

The big and heavy **Sony APM-141ES** looks difficult to resist at £200, and certainly goes loud with enough oodles of bass extension for Recommendation. But it's also too rich and heavy in balance for all but the largest rooms, and the top adds a tinkle of its own, the net effect being too much 'boom'n'tizz' – an effect that many may like, even though purists will object.

For rather greater refinement in the same price area, the £219 **Rogers LS4A** came within a whisker of a BB rating for its sheer honesty and thorough design competence. A slight lack of pace and residual boxiness leaves it in the Recommended ranks, though to justify the decision I must also change the Marantz *LD50DMS* rating in the June '89 tests from BB to R (after further re-auditioning the latter), the two having much in common.

Superbly built, finished and engineered for the price, the £240 **Cyrus 781** is rather fastidious about ancillary equipment and set-up. CD users will particularly appreciate its romantic portrayal and it is especially worth considering in the context of a complete Cyrus CD system.

New to loudspeakers, the cute little £275 **Sugden CL** needs a good drive amplifier but sounds very nice indeed when so driven, fine engineering and nice finish justifying Recommendation for this 'miniature plus'.

The £339 **Linn Kan 2** is the 'miniature minus' for those who want real bass alongside near invisibility. Again a good amplifier is mandatory, while even in *Mk2* form it remains a little too uncouth (ie thin and aggressive) for formal recommendation, but is worth consideration for all that.

The £350 **Bose 305** is a bit of an oddball, but it's a dynamic and enjoyable oddball that gives a fine in-room balance, even if the stereo is a bit weird and unpredictable.

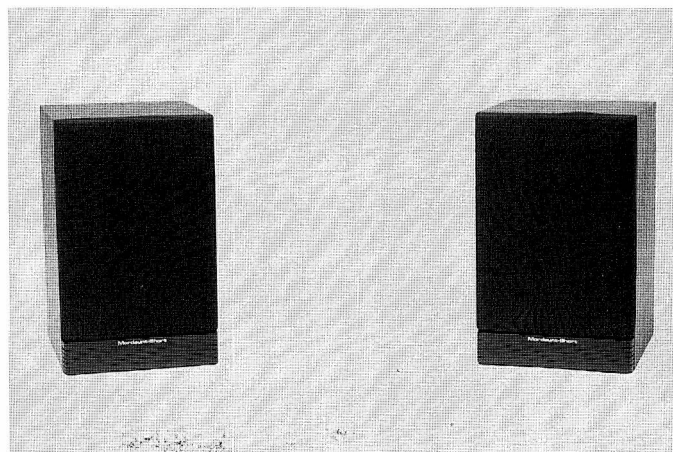
A price jump to \$485 brings the floorstanders into the frame, specifically the **Royd Apex**, which is strongly Recommended and certainly one of my personal favourites. Retaining much of the eager character of the informative *Eden*, the *Apex*' transmission line does a much needed fill-in job for the bass, giving a good overall balance with fine dynamics and pace at a very reasonable price, plus wiring flexibility that assists future system upgrades. Not the tidiest of sounds and not for headbangers, it is nonetheless amongst the most musically involving loudspeaker, at any price.

Delivering prodigious bass extension from a compact and competitive package, the Recommended **TDL Studio 1** (£550) is highly analytical, if a little short on emotional involvement, with the sort of character that best suits classical/CD sources.

Worth considering for its most civilised physical and sonic presentation, the £599 **Heco Superior 740** delivers much the same beautifully judged room balance as its cheaper, larger *Interior 430* stablemate – but looks a lot prettier whilst doing so.

The two Recommended models at £599 are so similar and yet so different, they illustrate to perfection the difficulties any reviewer of loudspeakers faces, in attempting to compare and evaluate. Both **KEF C95** and **Tannoy DC3000** are generous boxes for the price, from two of the most respected names in the business, and both use dual concentric main drivers. But the KEF is a polite, refined and slightly lazy creature which is warm, friendly and unlikely to offend. The Tannoy, in complete contrast, goes immediately on to the offensive, to wake you up about the real meaning of terms like dynamic range and headroom – and I have to admit it's the one I'd like to get back here, to try filling it with lead shot etc.

Also worth mentioning, as a pretty wall-mount bookshelf model with a very sweet sound, the £680 **Alphason Amphion** is too expensive for formal commendation, since its big *Orpheus* brother just made the grade at £800 six months back. But it is very sweet and nice for all that.



*Mordaunt-Short MS3.10: Lively, informative, and at £99 an obvious Best Buy.*

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# CHOOSING AND USING . . . VALVE AMPLIFIERS

*Last month we reviewed five valve amplifier components, this month we've four more. John Bamford has been listening, while Paul Miller provided technical measurements.*

While the microchip might seem to be taking over in the world of domestic hi-fi, the good old-fashioned thermionic valve still has a very high profile in audiophiles' systems. If you demand the best possible sound quality, are prepared to pay the price, and are willing to put up with the inevitable inconvenience which comes as part and parcel of valve amp ownership, the chances are you'll use a 'tube' amplifier and enjoy the surprised looks on folks' faces when they visit your home . . . "What? Do you mean to say some companies *still* make valve amplifiers?" (I get this all the time. In fact, I'm considering putting my response on tape to save breath . . .)

Valve amplifiers need a free flow of air around them, they tend often to be more noisy than solid state amps too, so even though the British company Audio Innovations has done much to reduce the price of valve ownership in recent times with its integrated models such as the *Series 300* (£425) and *Series 400* (£575), tube amps still remain the province of the really

dedicated audio enthusiast.

In addition to the tinkling of tubes and buzzing of large output transformers, valve amps can also be guilty of high levels of *electrical* system noise. More often than not it's the preamplifier which is to blame. However, none of the components tested this month, last month, or those in our October '88 issue, gave any real cause for concern in respect to untoward background noise – although correct matching of separate components is a particularly important issue.

With valve designs the output *impedance* of the preamplifier is an important parameter, not only in terms of straightforward voltage transfer to a load, but also with respect to the parallel capacitance of the interconnect cable that is used between pre and power amp. In the cases where a high output impedance is quoted (anything over a few thousand ohms) do try to avoid long interconnects.

Power amps with an input impedance around 10 or 20kohm will not pose a problem when matching up with any solid-state

preamp, but certain valve preamps may suffer a loss of bass extension simply through the current limitations of their output valve(s). Of course, this will depend very much on the topology chosen, but very low current double-triodes such as the ECC83 may cause problems if used in a lightly cap-coupled output configuration.

This sort of problem is cured with high input impedances (up to 0.5Mohm has been recorded), though if used with a high and variable source impedance, such as that presented by a 'passive preamp', it is possible that electromagnetic (hum) coupling will degrade the noise performance. It is also possible that the high frequency response may be curtailed.

Power amps with a very high sensitivity (that is, requiring just a few tens of mV for full output) will also be more susceptible to hum fields, especially if they also feature a high input impedance. The choice of preamp is critical here, as is the type and method of screening of the interconnect.

It is important to appreciate these problems – many of which are peculiar to the very specialised world of valve amps – even though a good dealer should ensure you do not make a mistake by choosing incompatible components.

## LISTENING TESTS

Many weeks have been spent auditioning this selection of valve amplifiers in various combinations. Turntables used were the Townshend *Rock* and *Rock Reference*, with *Excalibur* arms, and a selection of cartridges ranging from the Goldring *Eroicas* (high and low output), Audio Technica *OC9* and *ART 1*, and Koetsu *Red*.

CD inputs were tested using a Marantz *CD94* with Musical Fidelity *Digilog* outboard D-to-A converter, and speakers used were Snell *Type E, C*, and *A*.

Readers requiring a full explanation of the technical measurements should refer to last month's issue (page 123).

*Concluding another batch of gorgeous valve amplifiers. Doubtless more will follow soon . . .*



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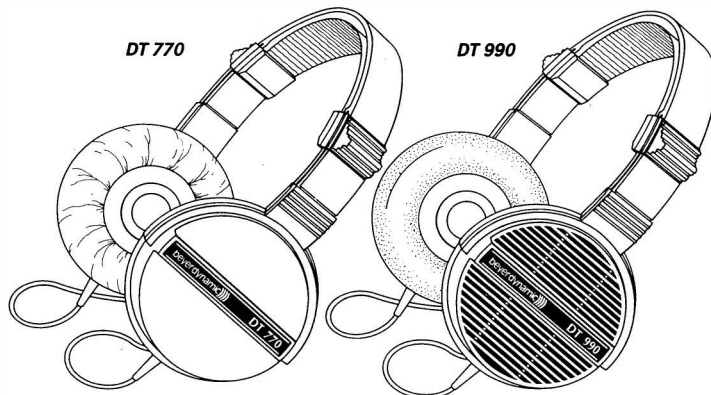
Perhaps we could persuade you that it will go nicely with other status symbols, like your Porsche.

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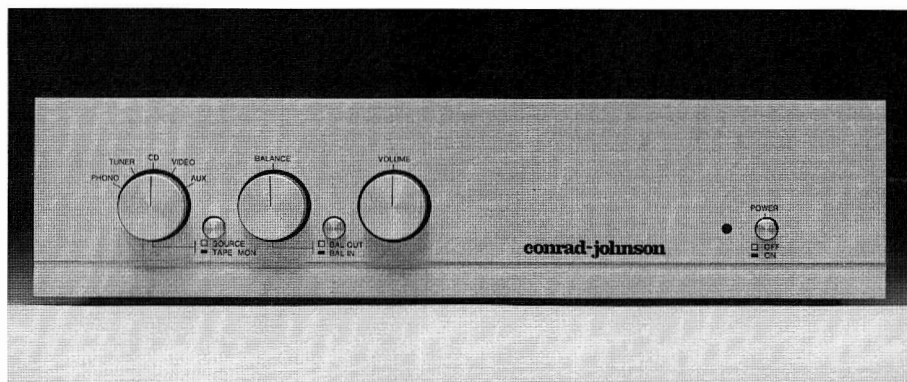
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# CONRAD JOHNSON PV10

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RECOMMENDED



The Conrad-Johnson brand, manufactured in Fairfax, Virginia, enjoys a very high reputation with American audiophiles but, due to a poor track record with various (now defunct) UK distributors, has never had a high profile this side of the pond. Thankfully, after a period of unavailability here, the product designs of messrs Bill Conrad and Lew Johnson are once again on sale in the UK, now through well-established high-end distributor Audiofreaks.

The PV10 preamplifier is a no-frills 'audiophile' device, using premium quality components throughout. Four line level inputs are provided, one of them a proper tape monitor circuit, along with the phono input. As with most (all?) valve preamps, the phono input is primarily for high output cartridges, however the sensitivity is high and consequently some low output MCs should work fine 'straight in', without the need for an additional step-up device. (See lab report.) A balance control is provided, something which the many purist preamp designs eschew, but this can be bypassed for the shortest and simplest signal path via a push button switch on the fascia. On the rear, all sockets are high quality gold plated phono types, and two outputs are fitted for ease of wiring into bi-amped systems.

## LAB REPORT

The basic topology of this valve preamplifier is based around C-J's costlier amplifiers, a fact reflected in its high performance. Sensitivity of the disc stage is very high, requiring just  $106\mu\text{V}$  for IV out (a total gain of 79.5dB). By using two 12AX7 (ECC83 substitutes) triodes C-J has succeeded in making the PV10 sensitive enough to accommodate many moving coil, as well as fixed coil cartridges. Noise is high at -84dB (A-wtd) but there remains sufficient excess gain to cater for a wholly passive RIAA equalisation network. As a result the PV10 offers overload margins that are midway between those usually associated with MM and MC inputs. For instance, treating the disc input as an MC stage the headroom at 1kHz measures a fabulous +44.7dB while treating it as an MM stage the headroom 'falls' to +24.7dB.

This, together with the 0.11-0.38 per cent THD, is reflected in the ultrasonic 3D plot which reveals that C-J has engineered a wholly 2nd-order distortion characteristic.

The IM routes given by  $F_{20k} \pm F_{0-20k}$  and  $F_{0-50k-0} \pm F_{0-20k}$  are clearly portrayed, their amplitude rising with decreasing frequency as a function of the RIAA curve - this type of distortion bodes well for sound quality! The accuracy of the RIAA network is also quite exceptional, offering -3dB points of 1.75Hz and 83.7kHz. RF IMD is fairly well controlled for a zero feedback valve amplifier, a 4-10dB modulation appearing from 1-40MHz.

C-J's line amplifier is based around a single 12AT7 (ECC81) double-triode that is direct-coupled to a cathode-follower to reduce the output impedance. A value of 377ohm should present few problems if long interconnects are used with the PV10, but in some systems the very high sensitivity (27mV for IV out) of the line input may reduce the usable range of the ALP's volume control.

## SOUND QUALITY

There's no doubt about it: C-J's designers know what they want, and they know how to get it. There certainly seems to be a family 'sound' to the company's preamplifiers (I've no personal experience of its power amplifiers - yet), the performance of this £1,400 PV10 model exhibiting cosmetic similarities with C-J's 'go-for-broke' two-box Premier Seven flagship which we reviewed in last year's Collection (Issue No. 72, July 1989). Best described as 'sweet' and refined-sounding, the PV10 has a 'lazy' kind of character - lazy in the best sense, in that it never sounds flustered or out of its depth. Like the Premier Seven (which these days costs £9,000!), it has an almost magical ability to separate out all the individual strands of the music; heavily processed multitrack recordings are stripped down and then reassembled in an orderly and intelligible fashion; naturally recorded audiophile recordings sound glorious, with instruments presented in wonderfully natural acoustics. The sound is dry and taut yet manages to avoid sounding compressed or 'sat on'. Imaging is fabulous.

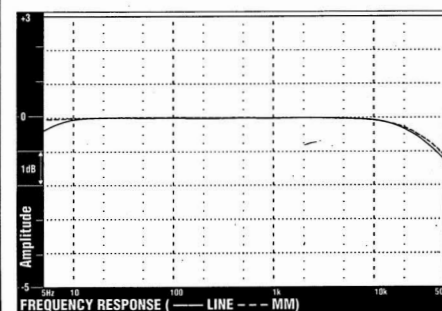
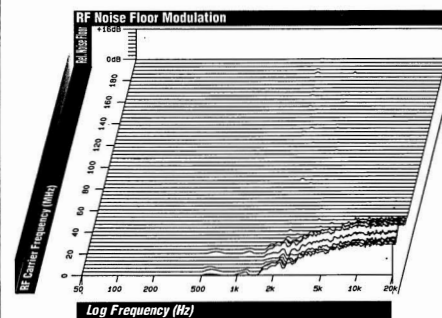
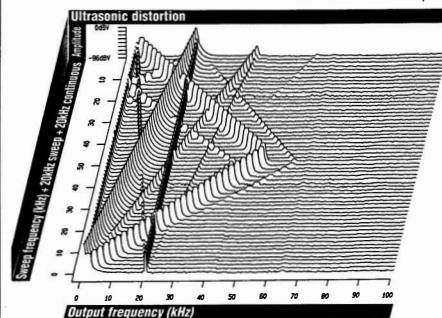
But here the comparisons with C-J's flagship have to end. What the PV10 hasn't got is the Premier Seven's remarkable ability to project the sound into the room, a phenomenon which usually one would attribute to the capabilities of a system's loudspeakers. The Seven is quite special in the way it does this, it really brings music to life, and good though the PV10 is, well, it's just not in that league.

## CONCLUSIONS

Conrad-Johnson's high reputation Stateside is clearly well deserved. The PV10 is a very refined preamplifier which should work well in all manner of hi-fi systems. Price is high, but then you get what you pay for - and for its superb performance combined with reassuringly solid build quality I think many audiophiles would consider it a high-end bargain. Highly Recommended.

## TEST RESULTS


	Aux/CD	MM/MC
Stereo separation (20Hz)	67.0dB	59.4dB
(1kHz)	61.7dB	64.3dB
(20kHz)	37.1dB	46.7dB
Channel Balance (1kHz, 0dBV)	0.06dB	0.66dB
(-20dBV)	0.50dB	0.11dB
(-60dBV)	0.16dB	0.84dB
Total Harmonic Dist (0dBV, 1kHz)	-82.2dB	-59.3dB
(20kHz)	-70.9dB	-48.4dB
CCIR Intermodulation Distortion (1:1)	-78.1dB	-38.2dB
Phase Shift (20Hz)	180°	169°12'
(1kHz)	180°	129°36'
(20kHz)	169°12'	79°12'
Squarewave linearity	-95.6dB	
Noise (A wtd, 20Hz - 20kHz)	-84.9dB	-60.8dB
Residual noise (unwtd)	-84.2dB	-84.1dB
Input Sensitivity (for 0dBV)	27.1mV	106.4μV
Disc Overload (20Hz)		7.44mV
(1kHz)		86.3mV
(20kHz)		747.9mV
(50kHz)		659.4mV
Preamplifier Output (max)/Impedance	21.2V (disc)/377ohms	
DC Offset, L/R		0mV/0mV
Retail Price		£1,395





# THE CHOICE DEALER DIRECTORY

Choosing a good hi-fi dealer is the most vital step in acquiring the system that is right for you. This unique directory gives full information on dealers in your area.

## AVON

RADFORD HI-FI, 52-54 Gloucester Rd, Bristol. (0272) 428247. Linn, Naim, Mission, Denon, Nad. 3 dem rooms. Installation. Access, Visa + credit. Service dept. BADA MEMBER 

ABSOLUTE SOUND AND VIDEO, 65 Park St, Clifton, Bristol. (0272) 264975. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER 

PAUL GREEN HI-FI LTD, Kensington Showrooms, London Road, Bath. (0225) 316197. Linn, Musical Fidelity, Krell, A&R, Creek, Rogers, Quad, Cust. car park. Best selection in the West. BADA MEMBER 

RICHER SOUNDS, 20 Cotham Hill, Bristol BS6 6LF. (0272) 734397. City-centre budget hi-fi discounts; most popular 'majors' from A to Z and all points in between; monthly 'specials'. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sats 10-5. Access, Visa, Richer ChargeCard.


## BEDFORDSHIRE

ASHTON AUDIO, 6 High Street, Dunstable. (0582) 608003. AR, Cambridge Audio, Denon, Incatech, JVC, Kenwood, Marantz, Monster, NAD, Nakamichi, etc. Credit to £1,000. Access, Amex, Diners, Visa. Service dept. Dem room facilities. Open 6 days, 9-5.30, 6p.m. Friday.


CAMBRIDGE HI-FI, 31 Cuthbert St, Bedford. (0234) 320535. Mission-Cyrus, Rotel, Kenwood, Pioneer, Mantecore, Revolver, Ariston, ITL, KEF, Monitor Audio. Single speaker dem room. 9.30-5.30 6 days. Free installation. Service Dept. Visa, Access. Credit facilities.


## BERKSHIRE

NEWBURY AUDIO, 2 Weavers Walk, Northbrooke Street, Newbury, Berkshire RG13 1A1 (0635) 33929. 6 days 9.30-6.00. Linn, Naim, Roksan, Exposure, Creek, Epos, Royd, Denon, Nakamichi. Single speaker dem room. Appts. necessary. Home trial facilities. Free installation. Service department. Late appointments. Access, Visa. Interest free credit subject to status. 6 days 9.30am-6.00pm.

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TECHNOSOUND, 7 Graville Square, Willen Centre, Milton Keynes. (0908) 604949. Bang & Olufsen, Denon, Rotel, Technics, Yamaha and enthusiast hi-fi. Also at Luton and Dunstable. BADA MEMBER 

AUDIO INSIGHT LTD, 53 Wolverton Rd, Stony Stratford, Milton Keynes. (0908) 561551. Arcam, Audiolab, Heybrook, Ion, Linn, Meridian, Quad and more. Access, Visa. Finance. Dem. room etc. BADA MEMBER 

AYLESBURY HI FIDELITY, 98 Cambridge St, Aylesbury. (0296) 28790. Denon, Dual, Exposure, Heybrook, Marantz, Musical Fidelity, NAD, Roksan, Rotel, Systemdek. 2 Dem rooms, appointment reqd. Mon-Fri 10-6, Sat 9.30-5.30. Home trial, free installation, credit to £1,500. Access, Amex, Diner, Visa. Service dept.


## CAMBRIDGESHIRE


CAMBRIDGE HI-FI, 1 Hawthorn Way, Cambridge. (0223) 67773. Ariston, ITL, KEF, Mission Cyrus, Monitor Audio, Pioneer, Revolver, Technics, Thorens, Kenwood. All credit cards.


STEVE BOXSHALL AUDIO, 41 Victoria Rd, Cambridge CB4 3BW. (0223) 68305. 10-6 - 6 days. 3 dem rooms, home trial, appts. preferred. Free installation and service dept. Access, Visa + credit. BADA MEMBER 

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DOUG BRADY HI-FI, Kingsway Studios, Kingsway North, Warrington. (Padgate 0925) 828009. 'Largest choice of specialist Hi-Fi in N.W.' All credit cards. 3 Dem rooms. Open 6 days. BADA MEMBER 

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RICHER SOUNDS, 4 Wellington St, Stockport SK1 3RN. (061) 480 1700. Cheerfully small store by BR station with virtually all major 'budget' names; many on special offer. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6, Sats 10-5. Access, Visa, Richer ChargeCard. Mail Order for all Richer Sounds stores from this branch.

CHRIS BROOKS HI-FI, 29 Gaskell St, Stockton Heath, Warrington. 0925 61212/3. Tues-Sat 10-6. 2 dem rooms. Credit facilities. All credit cards. Total absence of bull\*\*\*\*. BADA MEMBER 

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ACTIVE AUDIO, 12 Osmoston Rd, The Spot, Derby (0332) 380385. Arcam, Ariston, Celestion, Denon, Heybrook, Kef, Cyrus, Musical Fidelity, Marantz, Revox, Rotel, Rogers, etc. etc. Demonstration and home trial facilities. Account and credit cards. Ring for opening times and free 'Fact Pack'. BADA MEMBER 


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CHELSTON HI-FI, 38 Walnut Road, Chelston, Torquay, Devon TQ2 6HS. Tel: (0803) 606863. Denon, Marantz, Rotel, Musical Fidelity, Acoustic Energy, NAD, Castle, Heybrook, Celestion, JPW etc. 2 dem rooms. Home trial. Free installation. Access, Visa, Amex, Diners, Hi-Fi Markets Chargecard. Credit facilities. 9.30-7.30 Mon-Fri, 9.30-6 Sat.

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

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

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


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


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

PRO MUSICA, 6 Vineyard Street, Colchester. (0206) 577519. Linn Products, Naim Audio, Rega Research, Creek, A&R Cambridge, Ion Systems, Denon, Rotel, Epos, Ruark etc. Two single speaker dem rooms. Credit facilities. Access, Visa. Appointments bookable. Mon-Sat 10am-6pm.

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


## GLOUCESTERSHIRE


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

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

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
## HEREFORDSHIRE

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

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

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

## ISLE OF MAN


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

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JOHN MARLEY HI-FI CENTRES, 2 Station Rd West, Canterbury. (Canterbury) 69329. Also at Dover - (0304) 207562. B&W, Heybrook, Magnum, M.Y.S.T., Nakamichi, Pink Triangle, Rotel, Sansui, Technics, Quad. Dem and home trial facilities. Mon-Sat 9-5.30 closed Thurs. Free installation. Credit to £1,000. Access, Visa, Creditcharge. Service dept.

VJ HI-FI, 29 Guildhall St, Folkestone. (0303) 56860. Mon-Sat 9-6. NAD, Yamaha, Marantz, Cambridge Audio, Denon, Kenwood, Rogers, Dual, Musical Fidelity, Quad. Dem and home trial facilities, free installation, credit to £1000. Amex, Diners, Visa, Access. Service dept.

PHOTOCRAFT HI-FI, 40 High St, Ashford. (0233) 624441. No. 1 in Kent for Linn, Naim, Rega, Roksan, Exposure, Onix, Epos, Royd, Creek. But before you choose equipment choose where to buy it. Dem room, appts. necessary. Home trial and free installation. Visa, Access, Bada Chargecard. 9-5.30 Mon-Fri (Wed & Sat to 5 only). Service Dept.

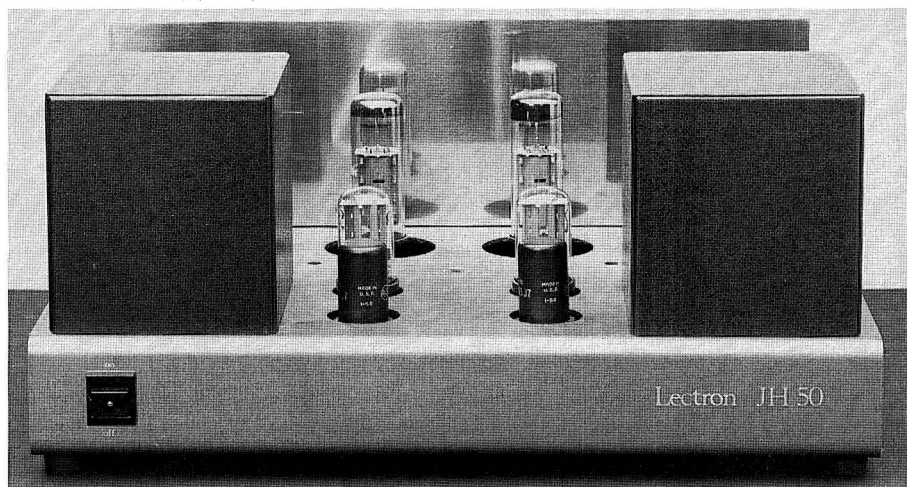
TONBRIDGE HI-FI, 31 High Street, Tonbridge Wells, Kent TN1 1XL. (0892) 24677. If your interest is music pay us a visit and find out what we do. BADA MEMBER 

## LANCASHIRE

MONITOR SOUND, 54 Chapel St, Chorley. (02572) 71935.

# LECTRON JH50

ELECTROACTIVITY, 11 MUSWELL AVENUE, LONDON N10. TEL: (01) 365 3614.



When working on a hi-fi magazine there's one thing you can always be sure of: you'll never run out of new products to talk about! Visiting last September's Penta hi-fi show at Heathrow airport was evidence enough that in the world of serious hi-fi, as in anything else, the world is getting smaller and smaller as young entrepreneurial companies continue to spring up all over the UK to act as importers and distributors for numerous esoteric brands of hi-fi components from overseas.

Electroactivity is one such new company. Run by a bunch of self-confessed hi-fi fanatics, it distributes such high-end esoterica as the *Arcici* turntable and wonderfully-named *Lead Balloon* turntable stand (highly regarded bits of kit Stateside), the GNP *Valkyrie* modular loudspeakers (also from America), and Lectron valve amplifiers from France. Lectron is based in Paris, the genius behind its product designs being the legendary French audiophile and critic Jean Hiraga, the man who first dared to suggest that cables affected the sound of hi-fi systems.

The Lectron *JH50* stereo power amplifier is a glorious looking product, all chrome and glowing valves, with beautifully finished brushed blue/grey casework. Contrary to our brief report on this new arrival in *Choice Sessions* a couple of months ago, the *JH50* is a Class A/B design employing two pairs of EL34s. Output binding posts are provided for 4 and 8ohm loads.

## LAB REPORT

The *JH50* offers some 65W via the 8ohm tap and 63W via the 4ohm tap. Distortion increases with both frequency and level, and so the 10W rating at 20kHz is merely a reflection of this – plenty more power is available if at the expense of THD. At 20Hz the 0.7 per cent THD was composed primarily of odd-order components whereas simple 2nd-order effects dominated through the mid and treble.

Interestingly, the CCIR IMD test revealed equal 2nd and 3rd-order products yet at a low 0.02 per cent respectively. Once connected to a 4ohm load and subject to the multiple-tone

ultrasonic test (3D plot) it is clear that both THD and IMD increased (particularly the latter). Second-order difference IM products are present within the audio band but at higher frequencies, where there is less compensation, the summation IMD routes extended right out beyond the 6th-order. The 2nd harmonic of  $F_{20k}$  is even quite visible at 40kHz.

This progressive decrease in linearity reaches a peak at RF where the amplifier is strictly operating under open-loop conditions, resulting in strong +30dB 'burst' demodulations at 30MHz, 80MHz and 140MHz. If my quick trial by substitution is any guide this appears to be linked to the paralleled EL34 pentodes and proprietary output transformers as much as the archaic CRC-6SJ7 triodes. It could be that any subjective graininess precipitated by FR IMD is smothered by the strong 2nd-order AF products.

Anyway, unweighted hum was still fairly high at -66dBV but the A-wtd noise (ref 1/3 power) proved to be an impressive -103dB; matched by an equally impressive midband separation which generally exceeded 100dB.

## SOUND QUALITY

Subjectively sweet and refined-sounding, the *JH50* demonstrated a 'luxurious' performance – controlled, 'rich' and eminently listenable. In my home system the sound was beautifully smooth and detailed through the midband, while treble detail was light and airy if lacking incisiveness and 'bite'. Bass appeared punchy and dynamic, but it didn't quite reach the lowest octaves.

In many ways the *LH50* is one of the finest power amplifiers I've ever heard, displaying similar detail characteristics to Audio Research's *Classic 30* thoroughbred. What it lacks to my ears, however, is the sheer speed and dynamics of true Class A valve amplifiers employing direct heated triodes. All the 'space' of the acoustic and depth and sound-stage is there in abundance, but with some recordings the musical performance lacks urgency and drama. Much of this, no doubt, will come down to good system matching. I bet this Lectron amp would sound fabulous

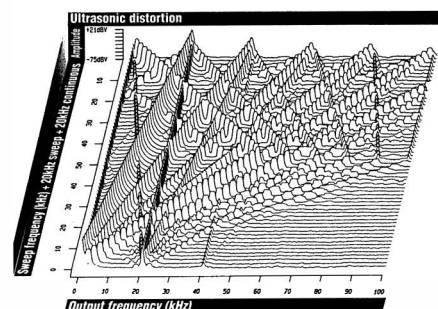
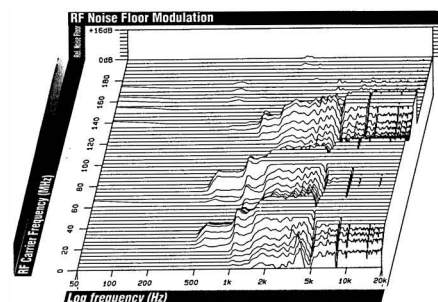
in some homes using planar loudspeakers, for example.

## CONCLUSIONS

Like many imported high-end products, price is against the *JH50*. Then again, if you're serious enough about your hi-fi to even contemplate spending £2,300 on a power amplifier, you're hardly looking for the best possible value for money! Clearly what's more important is that the amplifier does exactly what you want it to do and the Lectron *JH50* may do just that. It isn't hugely powerful, but it does sound delicate and refined. Who knows what two *JH50s* might produce in a bi-amped system!

## TEST RESULTS

Maximum Continuous Power output, 8ohms	20Hz	1kHz	20kHz
	40.8W	64.7W	9.8W
	4ohms	33.7W	62.5W
			1.6W
Dynamic Headroom (HF)			+ 1.11dB (83.5W)
Output Impedance	0.798ohm	0.801ohm	1.539ohm
Damping Factor	10.0	10.0	5.20
Stereo Separation (0dBW)	103.1dB	101.8dB	78.4dB
Total Harmonic Dist (0dBW)	-58.3dB	-72.7dB	-53.6dB
(1/3 power)	-43.2dB	-58.5dB	-34.7dB
CCIR Intermodulation Distortion (0dBW)			-71.6dB
CCIR IM Distortion (1/3 power)			-68.1dB
Rise Time (@ 10kHz)			5µsecs
Power bandwidth (< 1% THD)			120Hz-8kHz
Squarewave linearity			-85.4dB
Phase Shift 20Hz			352.30°
1kHz			359°
20kHz			334°30'
Noise (A wtd, 20Hz-20kHz) 0dBW			-88.4dB
(A wtd, 20Hz-20kHz) 1/3 power			-103.1dB
Residual noise (unwtd)			-65.9dBV
Input Sensitivity (for 0dBW)			73.9mV
(for full output)			611.3mV
Input loading			84kohm
DC offset, left/right			0.00mV/0.00mV
Retail Price			£2,300



A&R, Dual, Mission, Quad, Rogers, Rotel, Spendor, Thorens, Nakamichi, Yamaha, etc. 2 dem rooms. Open Mon-Sat, closed Weds. Free installation. Credit to £1,000. Access, Visa. Service dept.

## LEICESTERSHIRE

MJS HI-FI, 80 Stapleton Lane, Barwell, Leicester LE9 8HE. (0455) 46977. The Rock, Audio Innovations, Kelvin Labs, Snell, Helius, Sugden, Ruark, Concordant, Valdi, JPW. Our main aim is for our customers to enjoy music. Dem and home trial facilities. Mon-Sat 9.30-7.00. Free installation and service dept. Visa, Access.

THE LEICESTER HI-FI CO, 6 Silver Walk, St. Martins Square, Leicester LE1 5EW. (0533) 539753. 6 days 9.30-5.30. A&R Cambridge, Heybrook, Marantz, Mission, Musical Fidelity, Nakamichi, QED Hi-Fi, Quad, Revox, Roksan "and oodles more". Largest selection in Leicestershire. 2 dem rooms. Home trial arranged + free installation. Credit facilities. Hi-Fi Markets, Access, Visa, Am. Exp. Service dept.

## LINCOLNSHIRE

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## LONDON

A.T.LABS, 190 West End Lane, London NW6. (01) 794 7848. Mon-Sat 10-6. Two dem rooms. Access/Visa. Sony Hi-Fi News Best Dealer '86 & '88 (National). BADA MEMBER **3**

AUDIO T, 190 West End Lane, London NW6. (01) 794 7848. Mon-Sat, 10-6. Two single speaker dem rooms. Access, Amex, Visa. BADA MEMBER **3**

CORNFLAKE SHOP, 37 Windmill Street (just off Tottenham Court Road), London W1. (01) 631 0472. Mon-Sat 10-7. Rega, Roksan, Naim, Monitor Audio, Koetsu, Marantz, Yamaha, SME, DN, Epos. Three dem rooms, friendly, knowledgeable service. We design and install multi-room systems. Delivery and installation service. Credit facilities. Access, Visa.

COVENT GARDEN RECORDS, 84 Charing Cross Road. (01) 379 7635/7427. Quad, B&W, Meridian, Mission, Yamaha, Sony, A&R Cambridge, Nakamichi, Rotel, etc. Dem facilities - no appointment reqd. Mon-Sat 10-7.30. Home trial facilities, free installation. Access, Visa, American Express, Diners Club. Service dept. BADA MEMBER **3**

DIN, 25 Melcombe Street, London NW1 6AG. Tel: (01) 224 4413. Roksan, Quad, Denon, Meridian, Mission, Celestion, Krell, Apogee, Arcam, Nakamichi. Full demonstration and delivery. Free installation. Access, Visa, Amex, Diners.

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KAMLA ELECTRONICS, 251 Tottenham Court Road, London W1. (01) 323 274. Amadens, Ariston, BLQ, Gale, Incatech, JPW, Linn, Mordaunt Short, SME, Systemdek, Thorens, Townshend, Ruark, Wharfedale.

KJ WEST ONE, 26 New Cavendish St, London W1M 7LH. (01) 486 8262/63. Fax (01) 487 3452. Arcam, Audio Research, Croft, Epos, Linn, Marantz, Musical Fidelity, Quad, Systemdek, Voyd, 2 dem studios. Apts. nec. Home trial. Free installation. Service dept. Major credit cards. Mon-Sat 10-6pm. (Late night Thursday til 7pm.)

NICHOLLS HI-FI, 430-434 Lee High Street, Lewisham, London SE12 8RW. (01) 852 5780. Sony, Technics, Harman, JBL, Mordaunt Short, Kenwood, Panasonic, Hafler, Sumo, B&W. Dem facilities. Home trial. Free installation. Service dept. Credit available. Visa, Access. 9.30-6 Mon-Sat, Thurs till 1 o'clock.

ORPHEUS HOME DEMONSTRATIONS. (01) 299 0075. Alexander, Alphason, Cadence, Castle, Kiseki, Moth, Proton, Thorens, Townshend, Systemdek. Home demonstrations only. Apts. necessary. Home trial, free installation. Service dept. Three month interest free credit. Open 24 hours. All goods guaranteed two years.

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

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BASICALLY SOUND, The Old School, School Rd, Bracon Ash, Norwich NR14 8HE. (0508) 70829. Arcam, Linn, Naim, Denon, Spendor, Heybrook, Audio Technica, Creek, Rega, Epos, etc. 2 comprehensive dem rooms. Home trial. Free installation. Visa, Access. HP facilities. Tues-Sat 9.30-1. 2-5.30.

SOUND APPROACH, 161 Unithank Road, Norwich. (0603) 622833. Kuzma, Ariston, Castle, Denon, Exposure, Ion, Royd, NVA, Roksan, Ruark, etc. etc. Dem and home trial facilities. Mon-Sat 9-6.30. Free installation. Credit to £1,500. Visa, Access, Diners Club. Service dept.

## NORTHAMPTONSHIRE

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THE AUDIO SHOP, Coffee Tavern Court, High St, Rushden. (0933) 56651. Audio Technica, Denons, Goodmans, Rotel, Tannoy, Ion Systems, Thorens, Gale, BLQ, Royd. Dem room. Home trial and free installation. Mon-Sat 9.30-5.30 (Thurs 9.30-2). Service dept.

SOUND PRINCIPLES, 52 Queen Street, Wellingborough, Northants. (0933) 441907. Ariston, Celestion, Heybrook, Marantz, Mission, Nakamichi, QED, Rotel, Spendor, Yamaha and others. One demo room 22' by 11', well furnished. Home demo's by appt. Apts necessary. Free installation. Access, Visa + credit scheme available. Mon-Fri 10-6, Sat 9-5. Out of hour apts can be made.

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CHANTRY AUDIO, Chantry Walk, 18a Eldon Street, Tux-

ford, Newark, Notts NG22 0LH. (0777) 870372. Ariston, ADC, Gale, Infinity, JPW, Kelvin Labs, Proton, Rotel, Space Acoustics, Thorens. Single speaker dem room. Apts preferred. Home trial, free installation. Access, Visa + credit facilities. Mon-Fri 10am-4pm. Sat 9-30-5.30. Sun home dem by appt. Closed Weds.

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GRIFFIN AUDIO Ltd, 94 Bristol St, Birmingham. (021) 692 1359. Linn, Naim Audio, Rega, Creek, Denon, Nakamichi, Quad, Mission, Monitor Audio, Rotel. BADA MEMBER **3**

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

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

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## OXFORDSHIRE

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

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AVON HI-FI Ltd, 12 Barker St, Shrewsbury. (0743) 551166. A&R, B&W, JBL, Dual, NAD, Nakamichi, Revolver,

# OAKLEY IMAGE S

AUDIOFREAKS, 15 LINKWAY, HAM, SURREY TW10 7QT. TEL: (01) 948 4153.

RECOMMENDED



When *Choice* first encountered the Yugoslavian-made Oakley *Image* pre-amplifier, distributed in this country by Audiofreaks (the company which brought us the renowned Kuzma turntable and tonearm, also from Yugoslavia), we were forced to conclude that the product was not yet fully developed. Our review sample suffered from quite a few teething problems, including an obtrusively noisy phono stage and 'indifferent' quality volume control with very poor channel balance characteristics. Mind you, it did *sound* promising . . .

That was 15 months ago, since when the *Image* has been thoroughly re-worked and renamed *Image S*. Now using five valves in the circuit instead of four, the *S* preamp 'feels' more like a finished product, with gold plated phono sockets on the disc and CD inputs, a high quality ALPs potentiometer, and superior overall construction. Price has risen £74 to £499.

The *Image S* remains a minimalist design with controls simply for on/off, volume, source selection (phono/CD/tuner) and tape monitor. That's the lot. While preparing these reviews we also learned that Oakley has introduced another preamp which looks very similar to the *S* but employs a six valve circuit and sports a luxurious champagne gold face plate and control knobs. It's called the *Image Six* and commands a £100 premium.

## LAB REPORT

Having been extensively revised since our last test, the Oakley *Image* now benefits from an improved 84dB midband channel separation (line), excellent 0.17dB channel balance error and greatly reduced distortion. CCIR IMD now measures 0.0016 per cent via the line input and 0.017 per cent via the MM disc stage – a feature also reflected in the 'cleaner' 3D ultrasonic distortion plot.

An innocuous 2nd harmonic,  $2F_{0-20k}$ , is still apparent but all 2nd-order IMD routes ( $F_{0-50k-0} \pm F_{0-20k}$  and  $F_{20k} \pm F_{0-20k}$ ) are much reduced in level. My only worry is that improvements in 'transparency' throughout the audio range might serve to reveal more of the 2-20kHz noise resulting from demodulation of AM/RF signals in the 1-70MHz region.

The line input sensitivity (39mV) has been increased by +5.8dB but the disc input has remained fairly constant at 1.2mV for 1V

out. An ECC82 double triode is now used as a cathode-follower in the line circuit to improve its low frequency stability while a new 4-transistor regulator is incorporated to linearise the anode potential. More importantly, the unwt'd hum has been reduced to -81.7dBV while the A-wtd noise via disc clocked in at an impressive -86dB – a dramatic improvement on the original *Image* tested in October 1988.

Two ECC83s are configured in cascade for the disc input where the active RIAA network is both significantly more accurate as well as offering considerably more headroom (+38dB @ 1kHz). We also noted that the *Image S* proved very microphonic on the test bench; loading the flimsy case with a heavy weight should prove beneficial.

## SOUND QUALITY

In some circumstances, especially in small rooms where the *Image S* might have to be sited close to the system's loudspeakers, 'damping' the preamp may well improve sound quality. Yes, like the original *Image* preamp, this *Image S* is microphonic – and careful siting is important. With this proviso, the preamp is capable of truly excellent music making with the disc and CD inputs alike: it sounds sharp and vivid, with good detail resolution and wide dynamic range.

All the noise and sibilance problems we encountered with the first *Image* preamp appear to have been rectified with this new *S* model, while all the positive characteristics of the original design's sound have been retained. In short, the *Image S* sounds a little lean in the bass, but at the same time extremely lucid and quick on its feet with a subjectively 'fast' rendition of transients. Image size and depth are good for its class, although here the more expensive *Image Six* preamplifier is in a different league. Indeed, subsequent auditioning of the £599 *Six* model in a high quality system (with VTL monoblocks and Sound-Lab electrostatic loudspeakers) showed it to be a true thoroughbred.

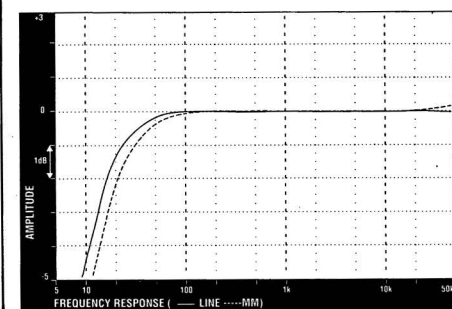
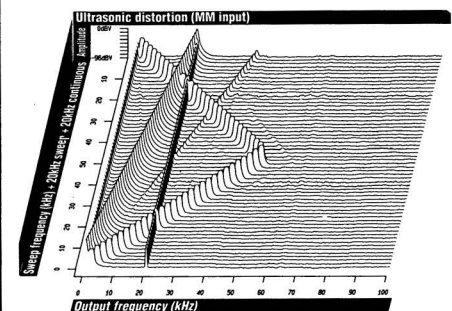
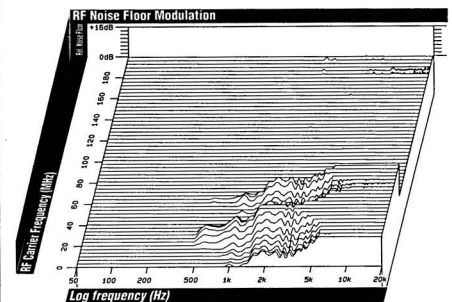
## CONCLUSIONS

Although slightly more expensive than before, this Yugoslavian-made preamp is now 'well sorted' and can be wholeheartedly Recommended. However, although we haven't fully tested the £599 *Image Six* we

were able to conduct A/B listening comparisons between it and this *Image S* model, and would conclude that the £100 premium for the *Six* is worth every penny. If shopping for a preamp of this calibre it's unlikely you'll be on a very tight budget anyway – so dig a little deeper and go for the more expensive model. Good as the *S* is, the *Six* is just so much better . . .

## TEST RESULTS

	Aux/CD	MM
Stereo separation (20Hz)	91.2dB	58.9dB
(1kHz)	83.6dB	65.0dB
(20kHz)	68.0dB	52.7dB
Channel Balance (1kHz, 0dBV)	0.01dB	0.23dB
(-20dBV)	0.17dB	0.34dB
(-60dBV)	0.02dB	0.24dB
Total Harmonic Dist (0dBV, 1kHz)	-96.0dB	-74.7dB
(20kHz)	-82.7dB	-58.2dB
CCIR Intermodulation Distortion (1:1)	-90.1dB	-69.6dB
Phase Shift (20Hz)	352°20'	0°
(1kHz)	0°	313°12'
(20kHz)	358°30'	279°0'
Squarewave linearity	-92.4dB	
Noise (A wtd, 20Hz – 20kHz)	-87.3dB	-85.9dB
Residual noise (unwt'd)	-81.7dB	-81.6dB
Input Sensitivity (for 0dBV)	38.7mV	1.212mV
Disc Overload (20Hz)		46.2mV
(1kHz)		402.9mV
(20kHz)		1139mV
(50kHz)		863.5mV
Preamplifier Output (max)/Impedance		19.9V/11.1ohms
DC Offset, L/R		-350µV/-200µV
Retail Price		£499



# THE CHOICE DEALER DIRECTORY

Trio, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9-5.30, closed Thur. Free installation, credit to £1,000. Access, Visa. Service dept.

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


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

## SOMERSET

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AERCO AUDIO Ltd, 11 The Broadway, Woking, Surrey GU21 5AP. (04862) 4667. Roksan, Exposure, Ion, Systemdek, Royd, Marantz, AR, Rotel, HK, Nakamichi, Oracle, Infinity, etc. BADA MEMBER 


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

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UNILET PRODUCTS Ltd, 35 High St, New Malden, Surrey KT3 4BY. (01) 942 9567. Mon-Sat 9-6. Thurs 9-7. Dem facilities. Large stock. Amex, Access, Diners, Visa.

SPALDINGS HI-FI, 352-4 Lower Addiscombe Rd, Croydon, Surrey. (01) 654 1231. 3 dem rooms + home dem. Free installation, credit. Mon-Sat 9-6, Tues to 8. Closed Wed. Service dept. BADA MEMBER 


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

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
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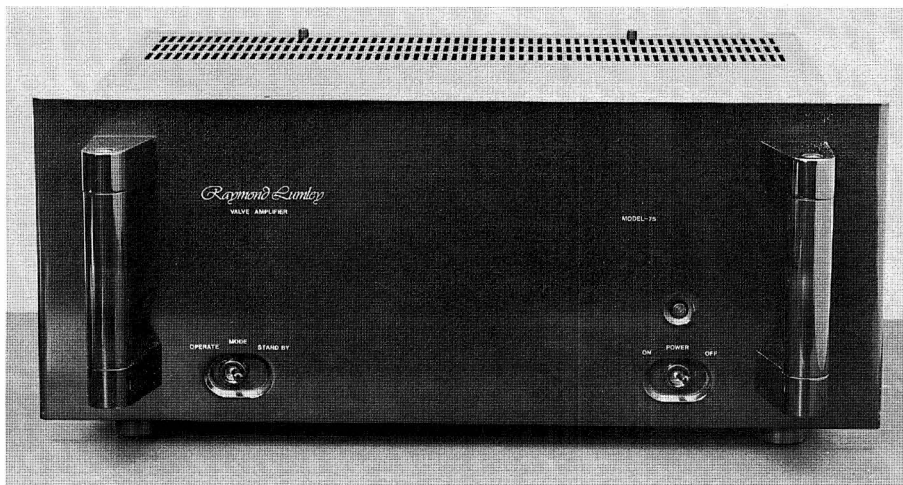
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# RAY LUMLEY MODEL 75

MAGAVOX ELECTRONICS, UNITS 12/13 PALMERSTON BUSINESS PARK, NEWGATE LANE, FAREHAM, HANTS PO14 1DJ. TEL: (0329) 230706.



The *Model 75* is truly a back-breaking beast of an amplifier, nominally rated at 75watts. What's more, what you see in the above photograph is only half of it; this is a monoblok power amplifier! Consequently you get an awful lot of metalwork for the £1,995 (per pair) asking price. Construction quality is first rate too, these monsters oozing class and inspiring much confidence for potential investors. The casework, sporting substantial grab handles on the fascia, is finished in a sleek and durable black gloss, while everything is nicely rounded with no 'unfinished' jagged edges – an important aspect since one presupposes that the *Model 75* will sit on the living-room floor, positioned close to the loudspeakers so that the shortest possible cables can be used.

For those unfamiliar with the breed, Lumley valve amplifiers are British through and through, the company's heritage dating way back to the days of Grant Lumley amplifiers. Nowadays, designer David Grant manufactures his own range of amplifiers under the Grant banner, while Ray Lumley's amplifier designs are manufactured by Magavox Electronics in Hampshire. Magavox also imports and distributes Doxa and Dolan products and Cardas cables, the latter representing the latest in American high-end esoterica.

## LAB REPORT

This power amplifier revealed certain parallels with the Lectron, particularly with respect to its midband power output (74W), noise (–101dB A-wtd) and numerical THD. Nevertheless there were just as many important differences, particularly in the complement of distortions. Power output also fell by some 3dB into lower impedances while THD increased very abruptly above 10kHz (visible on 3D plot). Consequently only 20W (8ohm) was possible at 20kHz with a ceiling of 5 per cent THD.

This explains the high 0.28 per cent CCIR IMD which increased to 2.4 per cent at two-thirds power. Similarly the amplifier could not reproduce an effective 10kHz squarewave, its settling time exceeding one-half cycle. Even at 1kHz the squarewave linearity only clocked in at –55dB.

The *Model 75* is a straightforward enough design, an ECC83 driving an ECC82 phase-splitter which is RC-coupled to a pair of 6550 output pentodes. Substantial BHC 1500µF reservoir caps are employed with discrete rectification. Many of the high frequency non-linearities exposed on the 3D plot are therefore just as likely to originate with the Drake output transformers as the active devices themselves.

Like the Lectron, the Lumley also suffered from strong 2nd and 3rd-order IMD routes though in this case there were difference as well as summation products. Furthermore the *Model 75* suffered IMD between the 20kHz tone and the 50kHz reversed sweep. Given by  $F_{0-50k-0} - F_{20k}$ , this tracks right through the audio band. RF IMD is a colossal +32dB from 1-400MHz.

## SOUND QUALITY

Perhaps not surprisingly, these *Model 75* monobloks pack a hefty punch. The sound is extremely 'relaxed' and authoritative, the amplifiers seemingly taking everything in their stride with ease. Huge dynamic swings seem to leave the .75s totally unflustered such is the amount of available headroom.

Headroom notwithstanding, however, there is a 'sluggish' quality to the musical performance which I would suggest is an effect caused by the somewhat ponderous bass performance. Easy on the ears overall, with good soundstaging and reasonable transparency, the sound is arguably too undemanding and 'slow'. Bass is extremely powerful – goodness knows what these amps would sound like with a pair of TDL transmission lines – but in my system it lacked definition and tunefulness.

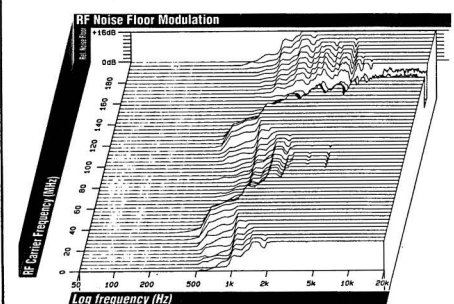
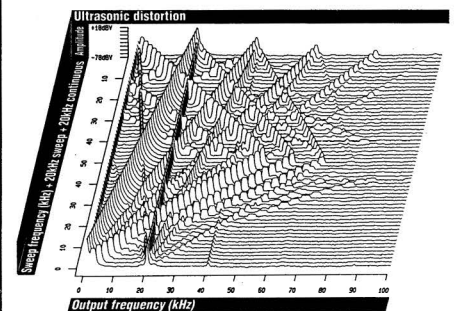
## CONCLUSIONS

Getting the best from the Ray Lumley *Model 75s*, as with all high quality components, will be down to good system matching. In the wrong system they will sound 'thick' and heavy-handed – so beware! In a well balanced set-up the sound should 'open out' enabling you to enjoy the sense of immense power, coupled with good imaging and a 'civilised' tonal balance.

Without doubt a pair of *Model 75s* represent a lot of amplifier for the money, but careful auditioning is essential before you buy. (Isn't it always?) Indeed, while the amplifiers supplied to *Choice* for testing were hard wired, we understand that the very latest versions emerging from the Magavox factory feature new pcbs with a few uprated components, plus some other running improvements such as Michell output binding posts and high quality Cardas phono input sockets. As I said, good value for money – and well worth investigating.

## TEST RESULTS

Maximum Continuous Power output, 8ohms	20Hz	1kHz	20kHz
	31.0W	74.0W	1.09W
4ohms	13.2W	31.7W	1.82W
Dynamic Headroom (IHF)			+1.26dB (99.0W)
Output Impedance	0.529ohm	0.597ohm	0.353ohm
Damping Factor	15.10	13.4	22.7
Stereo Separation (0dBW)			N/A
Total Harmonic Dist (0dBW) (½ power)	–57.4dB	–75.3dB	–39.6dB
CCIR Intermodulation Distortion (0dBW)			–44.8dB
CCIR IM Distortion (½ power)			–26.5dB
Rise Time (@ 10kHz)			13µsecs
Power bandwidth (<1% THD)			200Hz-5kHz
Squarewave linearity			–54.6dB
Phase Shift 20Hz			28°30'
1kHz			0°0'
20kHz			327°30'
Noise (A wtd, 20Hz-20kHz) 0dBW			–85.2dB
(A wtd, 20Hz-20kHz) ½ power			–100.5dB
Residual noise (unwtd)			–59.9dBV
Input Sensitivity (for 0dBW) (for full output)			518.8mV
Input loading			2.21kohm
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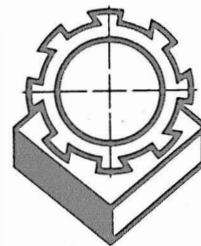


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# PERSONAL STEREOS

*To enjoy good sound from a personal stereo it's usually worth spending a bit extra. Jason Kennedy has been listening to some of the more expensive Walkmen around.*

In June 1979 Sony introduced the *Stowaway* to the world with a rather unmemorably named model - the *TPS-L2*. Its title may now have been forgotten but the effect it had on the audio market place in the '80s will be remembered for a long time. The *Stowaway* was priced at £99 and featured such indispensables as a treble control and independent left/right volume adjustment. Ten years on, the average amount spent on a personal stereo is around £24, and now the emphasis is on bass boosting.

This month's personal stereo test focuses on the upper end of the market with eight models spanning a price range of £80-£150, an area dominated by dinky cassette box sized machines featuring chrome/metal tape equalisation, headphone lead remote control and some form of bass boost as standard. As a contrast the two sub-£100 models are relatively large and more obviously plastic, but as you will see this doesn't detract from their ability to shoulder hordes of features. These bigger beasts are apparently also more robust, the more expensive models being quite deli-



## Personally Speaking

cate and requiring reasonable care in use if they are to stay in one piece.

The test procedure involved listening to a combination of high quality commercial recordings of acoustic and electronic jazz and some home brewed rock tapes. The machines were used primarily with the earphones supplied but some listening was carried out with a domestic hi-fi system, and it's worth remembering that upgrading the phones is almost always worthwhile if you want a more appealing sound.

### AIWA HS-PL300

The Aiwa *PL300* is a simple, even elegant little player. Aiwa's styling department has restrained itself on the logos front and made good use of the attractive matt silver

finish, leaving the three position *DSL* switch highlighted in chrome. This latter control is a two level bass boost which for a change works fairly subtly. All the controls, except autoreverse mode, are grouped at one end of the unit and include all the usual, plus an on/hold/off slider for the remote, the centre position disabling the buttons on both remote and machine. The remote itself is pretty basic, catering for play and direction change, stop, fast forward, rewind and volume, and when used it emits a bleep or two as an indication that it's got the message.

The phones are the usual in-ear bandless type, but they attempt to distinguish themselves with two chromed plastic pipe like bits - an imitation of the turbo bass

system found on Aiwa's separate walk-phones, although in this case it looks entirely cosmetic. To power up the *PL300* you can use the supplied rechargeable battery which can be charged-up onboard the machine and is said to last three hours after a 15 minute charge - which isn't bad. Alternatively, a pair of pen torch batteries can be used in the external holder, but this increases the length of the machine and does nothing for its looks.

In use it's tricky to see how much tape is on each spool, especially if there's not a lot of light available, but unlike virtually all the other machines there is at least a chance of working this out. The primary transport controls are large enough for easy use but the legends are merely impressed into the silver casing which, whilst pretty, makes them unclear at a distance. However, in most ergonomic respects the *PL300* is very good, its relative lack of controls setting it in good stead.

On the sound quality side this unit was one of the better models - transport stability proved to be quite good by tiny Walkman standards but some wow was noticeable. Balance was on the warm side with ferric and chrome tape but slightly tinny with metal. The *PL300* is capable of extracting a reasonable amount of infor-

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mation off tape but it does so in a mid-forward and slightly bland way, which by the standards encountered in the group as a whole is a fair result.

### AIWA HS-PX303

Compared to its sidekick the *PL300*, the *PX303* is a much more serious looking machine. For a start, it's black which as we all know is 'bad' and it has things like parametric *DSL* and Dolby *C*. Say no more. It also has the sort of transport controls found on conventional cassette decks, and at £150 I guess this is the least one should expect. So what on earth is a parametric *DSL*? We came across the latter on the *PL300* and it's a crude bass boost with two levels and an off position; the parametric bit refers to a switch marked 'frequency' that adds two steps to the scale, giving you finer control over tonal balance.

The sensibly scaled transport controls all appear to be mounted on the same slightly flexible backing, and when one button is pressed the others bend down a little which may not bode well for long term reliability. But I'm nit-picking again. The *PX303* is sensibly laid out, with controls at the one end for the likes of tape type, Dolby and volume. The buttons and knob that you use on a regular basis are repeated on the remote that sits in-line on the earphone cord. Unlike the cheaper *PL300* this one doesn't issue bleeps when it's used, but as something sonic happens anyway, ie the music stops or starts, that's no great loss. The slot on the front of the *PX303* is so narrow that there is no way that you can see how much tape is on each spool. This is OK if you know your tape, but a nuisance if you don't.

The phones and remote are the same as those on the *PL300* with the exception of a gold, rather than chrome plate effect on the turbo tubes. The power options are also similar – a rechargeable battery and charger, plus a battery holder for a pair of triple A batteries, or alternatively the charger can be used for direct mains power.

As one might have hoped given its £150 price tag the Aiwa *PX303* proved to be one of the more impressive machines in the test, capable of extracting previously muddled musical detail and presenting it in a coherent fashion. The balance definitely errs towards the neutral which is a novelty in a batch of midrange freaks like this, and in turn makes music sound more accessible and believable. Some wow or flutter is evident on more revealing material, but generally this Aiwa was the most confident small player in the bunch. There is an underlying 'edge' to the sound which can be slightly fatiguing, a side effect of the detailed musical presentation. But that said, if you want a neat and powerful personal it's amongst the top contenders. Recommended.

### PANASONIC RQ-P505

The £100 *RQ-P505* is the cheaper of the two

Panasonic models tested but it's by no means a scruffy product and is in fact pretty slick in a reasonably understated sort of way. The plain black fascia with its gold coloured corner pins is a far cry from the glitziness of cheaper personals – even the Dolby and *XBS* logos are restrained. This simplicity, combined with a selection of attractively designed switch buttons, makes the *P505* a rather swish little gadget and one that would most certainly grow legs if left in the wrong place at the wrong time.

On the controls front the left side of the machine houses four rounded transport switches and a door release for the cassette compartment, whilst around the corner are the usual tape type, Dolby and volume controls. This year's fad gadget seems to be extra bass (greater output rather than extension) which can be quite handy with the tiny in-ear phones that are generally supplied. The *P505* has something called *XBS*, a straightforward on/off affair that can have quite a dramatic effect depending on the music being played.

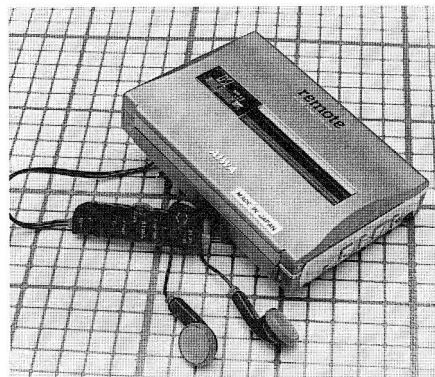
The remote is a very simple looking device with one button and a volume control, but that single button operates almost like a morse code generator – ie according to how many times it's pressed it will stop, start, forward or rewind the tape and even change direction of play. Not surprisingly the device emits little bleeps when it's used, which is OK, but the regular pulses that come through in wind modes are slightly irritating. The earphones themselves are a little larger than usual, but not so much as to be uncomfortable.

The *P505* will run off an internal rechargeable battery for which a neat charger with built-in plug is supplied, or using a snap on casing a single 'AA' battery will keep it going for a while. There is a socket for direct mains connection but no lead as such, so if you use these things at home a 1.5v adaptor with the correct polarity plug will have to be purchased.

When it came to listening to the selection of test tapes the first impression was that the battery was running low, such was the degree of transport instability. The external battery pack was brought into play with a fresh cell, but this failed to rescue what is a more than usually unstable transport. The tonal balance leans towards the mellow side of neutral with some emphasis on vocals, which combined with the transport situation makes for a machine that suits aggressive rock and pop but doesn't really make the most of more subtle material.

### PANASONIC RQ-P525

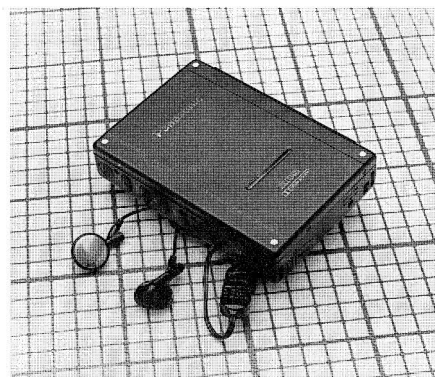
For another £20 over the price of the *P505* you can buy the Dolby *C* equipped Panasonic *RQ-P525*. This machine has a marginally higher feature count than its brother and a slightly different appearance, but it's essentially the same chassis. Most of the switches are in the same place but oddly



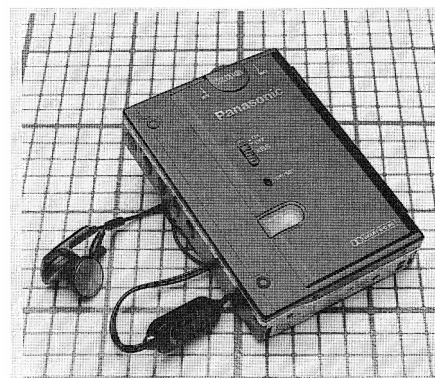
Aiwa HS-PL300.



Aiwa HS-PX303.



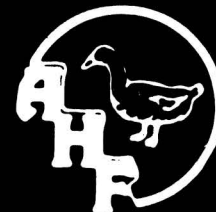
Panasonic RQ-P505.



Panasonic RQ-P525.

enough minor controls such as reverse mode etc don't have such attractive buttons. But I guess that's a matter of taste, as is the design of the *P525* which is less clean than that of the *P505* – the lid sports a bigger, perhaps better *XBS* control system comprising an on/off switch and a rotary adjuster, much like the bass tone control on an amp. It's obviously more flexible than a two position switch and gets over

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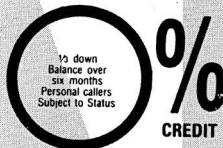
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the lack of subtlety inherent therein. The *XBS* on the *P525* is in fact quite smooth and progressive in operation.

The only other noteworthy element on the lid is the spyhole over one of the spools which lets you see whether it's running. However, there's no means of assessing how much tape is left on the spool which could be a nuisance. On one side of the case is a row of rounded transport control buttons and release catch for the lid, or that's what it's supposed to be – inserting a tape rather too casually can result in a jam-up situation that requires some thought to overcome. However, given the fairly flimsy nature of very small personal stereos they all require some care in use and don't take too kindly to rough handling.

Otherwise the controls are quite elementary, with both Dolby noise reductions being represented and two reverse modes available, plus a hold button to disable the controls when the unit's in your pocket or bag. The earphones and remote are the same as the *P505*'s, the remote housing one button, a volume knob and the morse code manual on how to get the remote to tell the machine what you want it to do. There's a collar around the jack plug which presumably transmits the dots and dashes to some form of microprocessor. Power supply options are also exactly as found on the *505*.

The *525* easily proved itself worth the £20 price premium over the *505*. For a start wow and flutter is no worse than average, which is an important factor, and a sense of depth and dynamics was extracted from some of the tapes. It managed to play back music in a relaxed and well timed fashion and really came into its own with the two rock tracks which benefited significantly from the *XBS* boost system. The *525* is a euphonic rather than highly informative player but under the circumstances such an approach is highly appropriate and conducive to listening pleasure. Recommended.

### SHARP JC-270E

The £130 Sharp *JC-270E* is, well, perhaps a little old-fashioned looking compared to the market leaders Sony and Aiwa, and for a player of this price it's quite basically equipped. It does have bass boost – *X-Bass* – remote control and Dolby but only in their simplest forms. However, if this means that Sharp has paid more attention to important aspects such as sound quality and reliability then all the better.

The *270E* feels solid and at a guess weighs more than the other miniatures in this group though it's only marginally bigger than a cassette box. The transport controls are located on the lid of the machine, which if not revolutionary does make them more accessible under certain circumstances (such as on the reviewer's desk), but may be less useful in a pocket, when it's more practical to use the remote, a

simple stop/play/direction change and volume controlling device that sits between player and earphones. A switch on the machine can be used to alternate control between the remote and the player avoiding accidental changes of mode, but this doesn't apply to the most crucial of all – volume – which is active in both cases.

The phones are pretty much par for the course – small in-ear jobbies with a longer cord to the right phone than the left so that it can be worn around the back of the neck.

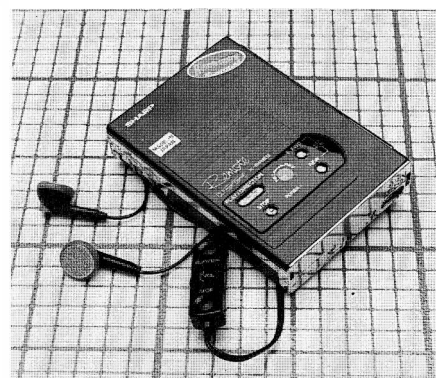
Power can be supplied in the usual three ways: onboard rechargeable, clip-on double A battery, or from the mains via the transformer/charger that comes with the package. One other detail worth a mention is the little viewing slot over one drive spindle which gives visible indication of which way the machine is playing or winding.

Using high quality commercially made recordings the Sharp sounded reasonably convincing though not entirely natural and some instability was noticeable with critical material. Tonal balance sounded as though it would be most neutral between the *X-Bass* on and off position, though with non-acoustic material bass boost is generally preferable. Home brewed tapes varied more than usual in response which is a logical state of affairs but one that isn't really emphasised on other players, nor did the Sharp seem particularly revealing. But at the end of the day this player turned in a reasonable if uninspiring performance that's better suited to beats than symphonies.

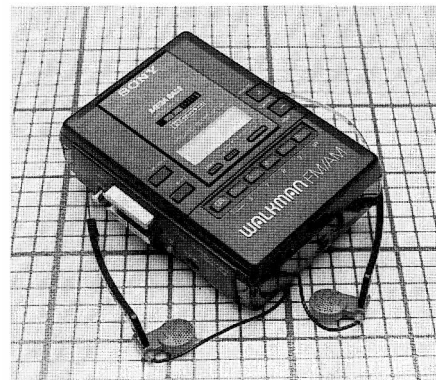
### SONY WM-BF65

It would seem that £100 is the least you have to pay for a slimline cassette box size player – below that point players get bigger and more obviously plastic, as is the case with the Sony *WM-BF65*, the first genuine Walkman in the bunch. Compared to most of the other players it's ungainly and button-spattered but then again it's well hung with features, with an AM/FM radio and alarm clock alongside the usual cassette playing controls. The latter are mechanical and larger than those on the more expensive players, which in turn makes them easier to use.

The front of the machine is equipped with a selection of electronic buttons, the majority for the radio which has both the usual wavebands and five two-function presets allowing the storage of ten wavelengths. Tuning in and storing station frequencies is all pretty straightforward, as is setting the alarm clock which is much like a digital watch in operation. The radio even has stereo/mono switching which can be handy, especially if the headphone cord/aerial isn't stretched out and reception in stereo is noisy. Being a sub-£100 player doesn't stop it from having *Mega-bass*, and a three position slider is fitted to the compartment lid offering varying degrees of low frequency emphasis.



Sharp JC-270E.



Sony WM-BF65.

There's no lack of features in the cassette playing department either with most mod cons except Dolby C being ready for action at the flick of a switch. The only obvious omission is a remote control device on the headphone lead, itself a straightforward affair that attaches to a pair of Sony's forward facing in-ear phones, the type that have an adjustable headband. And the same type that did very well in our last headphones test, although those cost £20 on their own.

Listening to the *BF65* it became clear that its extra bulk is to the advantage of its musical ability – logically it's much easier to build a competent transport if there's more space to do it in. This Walkman has a fairly bright balance that gives the impression of openness and clarity, a tendency also inherent in the earphone type. As a result, music becomes apparently quicker and more punchy, a desirable effect as long as it doesn't lead to listening fatigue which occurred with my metal Grateful Dead tape. Overall the cassette department made a good impression given its price, and if size isn't of importance it looks like a pretty good deal. The radio suffers from constant low level hiss and doesn't cope very well with weakish signals; it's also quite sensitive to positioning which doesn't really seem practical for a portable. But I'm being harsh again – after all it has got presets and a mono switch which is indispensable. Recommended.

### SONY WM-701C

For my money this has got to be the prettiest machine in this group, its champagne finish and slightly sculpted metal casing giving it a luxurious feel that belies its purpose. Sony's design department is one of

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the most original in the Orient and by avoiding the macho approach I suspect they have assessed the market for miniature personals quite accurately. Black, button-bristling Walkmans need a bit of substance to really make the grade, but the discreet pearly look really suits dinky little objets like this. But it's more than just a nice box, it also purports to play compact cassettes, and sliding the lockable lid catch to the right allows a view of the delicate looking transport and head mechanism.

Around the edges of the marginally bigger-than-a-cassette-box-sized-case are a variety of small buttons which between them offer the full gamut of features accorded to this type of machine: Megabass, Dolby B and C, chrome/metal eq. etc. Most are clearly marked with white lettering but the silver transport controls have little arrows in relief which do the job adequately. There's even a pair of illuminated arrows which indicate direction of play and whether forward or rewind is in operation.

The headphones and remote control are in a different category to the other personals tested; for a start the plug isn't your regular jack but a flat nine pin device like a large telephone plug. The remote isn't particularly complicated, no more so than those on the Aiwas, so it's difficult to figure out why this unusual and expensive system is used. One explanation is that this plug automatically locks in and can't be released unless the cassette compartment is opened (unless it's forced – not difficult and a natural tendency – be careful) and another is the amount of minijack sockets which are prone to become faulty with all the yanking that is inevitable with personals. If you want to use a regular pair of cans a separate converter is supplied with a 2.5mm socket for the purpose. The phones themselves are quite upmarket foldable, forward-facing types called *MDR-A20*, so their similarity to the successful *MDR-A21Ls* of our last headphone test (Issue No. 75, October '89) is no surprise.

The *701C*, which also comes with a tuner in its *F701C* guise, can be driven with its internal rechargeable battery (charger supplied) or using a single 'AA' battery in an outboard case, but there wasn't one supplied in the rugged plastic box that this Walkman comes in.

Sonically, the *701* proved to be both delightful and frustrating. I'll start with

the bad news – it wows and flutters like a good'un which is disappointing and pretty damn poor for £150. But on the other hand its sound quality is superb. Like the *Walkman Pro* in one of our previous tests it stood head and shoulders above the rest of the group with its remarkable ability to give notes shape and depth, even dynamic range. Obviously the electronics are very good for a tiny machine – if only the same could be said of the transport.

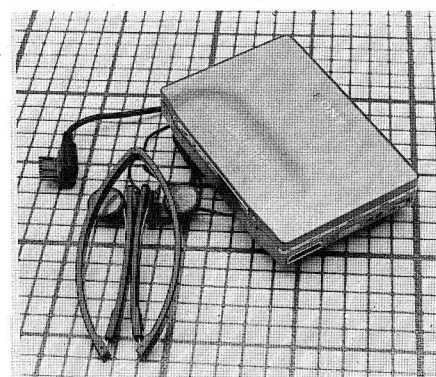
### TOSHIBA KT-4549

Like the Sony *BF65*, Toshiba's *KT-4549* is a cheaper and larger machine than the majority of those in this group. It's £10 cheaper than the Walkman but at a glance appears to have as many, if not more features. For starters it's got that bane of cheap hi-fi – a graphic equaliser (or should that be bane of fidelity?), but as entertainment not fidelity is the *raison d'être* of personals such devices can be useful. Graphic aside, the closer you compare the *4549* with its Sony competitor the more alike they seem. The tuner has the same controls and works in the same way and all the transport controls are the same, if not in the same place. Hmm . . . Anyway, yep, it's got a digital tuner with ten presets that can be accessed with six buttons. Memorising stations is a simple matter of tuning in with the auto tune buttons and pressing memory, then choosing a preset number. It's also got an alarm clock which is displayed unless the radio is used.

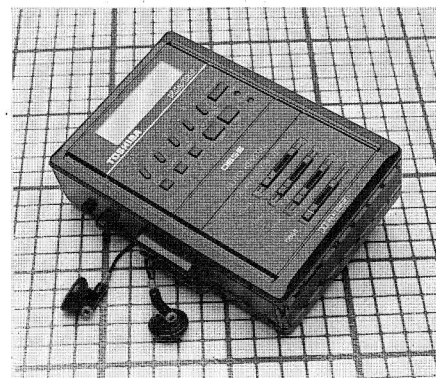
But has it got extra bass? Of course it has – the fourth band of the graphic is labelled *DBSS*, an abbreviation that isn't explained in the manual and doesn't really lend itself to anything logical (we'll have to run a competition for the whackiest interpretation).

Perhaps £100 is the price barrier for remote controls – this £80 model has a clean earphone cord, devoid of any little plastic switches, and terminating in a pair of intra-aural bandless phones which for a change are clearly marked in red and blue for channel identification. Power can be supplied from a pair of 'AA' batteries or a mains adaptor but neither is supplied with the *4549*, leaving you an additional expense of 60p and/or about a fiver.

Sonically it shares a certain brightness of tone with the cheaper Sony, sounding more open and lively as a result, but its bass boost system is pretty ineffectual which doesn't help the lightweight feel. It



Sony WM-701C.



Toshiba KT-4549.

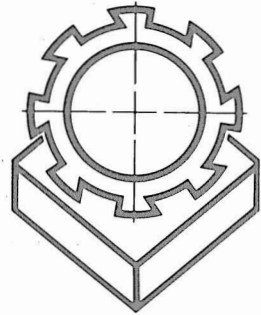
was less enthusiastic about the poorer quality recordings in the test making them sound very mid-forward and 'small', highlighting a fundamental lack of transparency. Further listening didn't really help matters much and at the end of the session my ears were eager for a break, a common reaction to cheap personals. The radio proved similar to that on the *BF65* but even more ignorant of weak signals.

### CONCLUSIONS

Taking the group as a whole I was unimpressed with the levels of audible wow and flutter, a factor that seems just as prevalent in the expensive players, possibly as a result of size constraints. But that aside, it would seem that you get what you pay for – the more expensive Panasonic, Aiwa and particularly the Sony offering obvious sonic improvements over the cheaper models. At the end of the day it must be said that very small and compact personal cassette players are particularly desirable items, and on the whole they offer more appealing sound quality than less expensive Walkmen. If it was my money on the line I'd learn to live with a bit of flutter and plump for the *WM-701C*, but a bulky *Walkman Pro* is more my cup of tea.

### FEATURES CHART

	AIWA HS-PL300	AIWA HS-PX303	PANASONIC RQ-P505	PANASONIC RQ-P525	SHARP JC-270E	SONY WM-BF65	SONY WM-701C	TOSHIBA KT-4549
Price	£110	£150	£100	£120	£130	£90	£150	£80
Dolby	B	B/C	B	B/C	B	B	B/C	B
Remote	yes	yes	yes	yes	yes	no	yes	no
Tuner	no	no	no	no	no	yes	no	yes
Rechargeable, batt. type	yes, 2 x AAA	yes, 2 x AAA	yes, 1 x AA	yes, 1 x AA	yes, 1 x AA	no, 2 x AA	yes, case not supplied	no, 2 x AA



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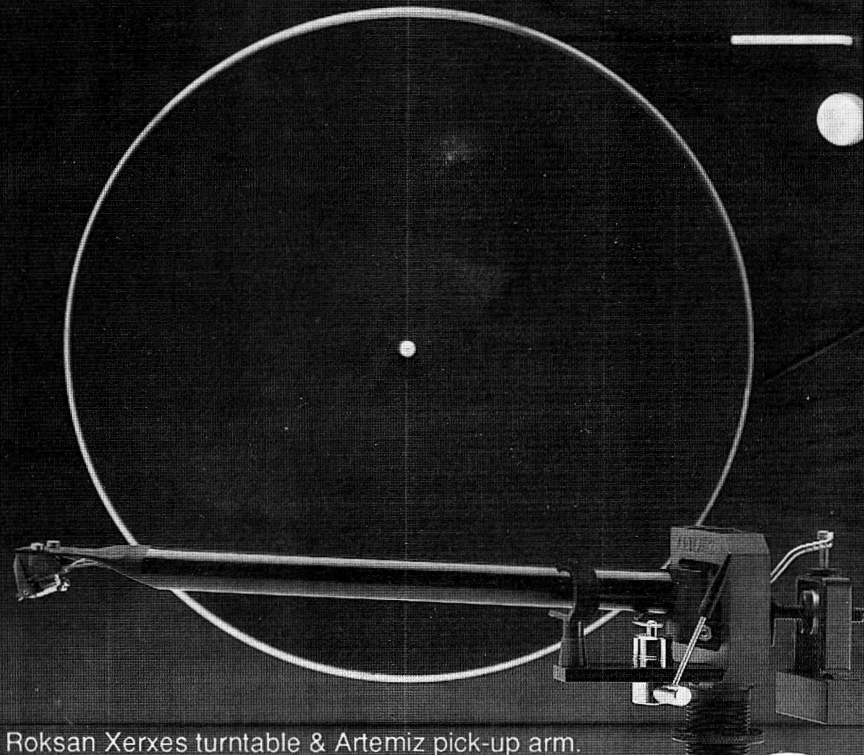
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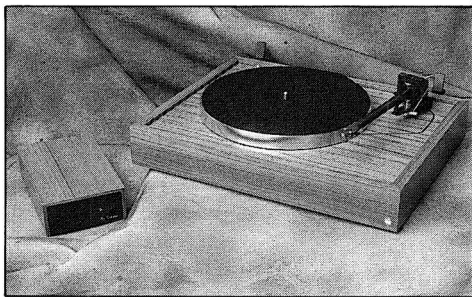
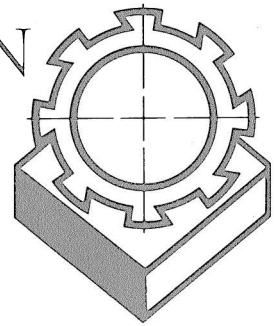
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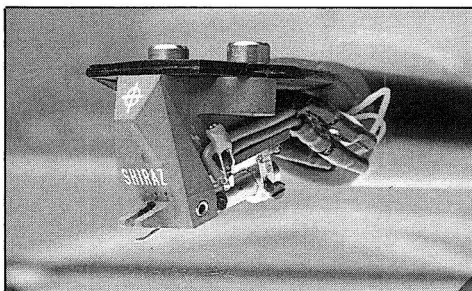
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*Jimmy Hughes – Hi-Fi Answers October 1989*

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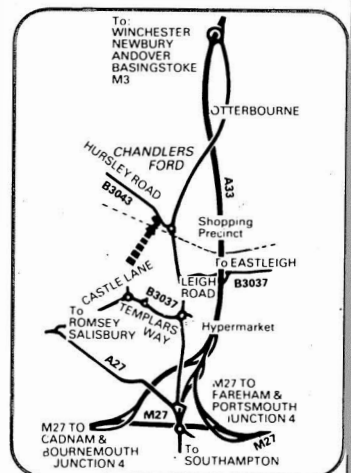
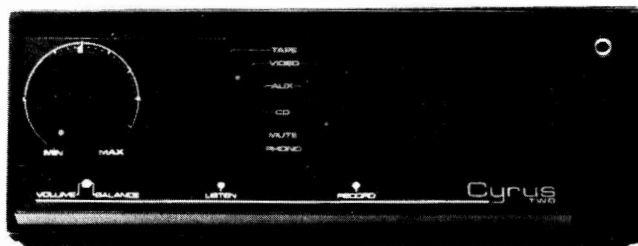
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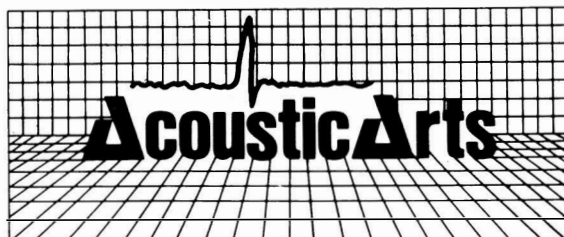
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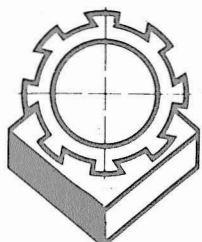
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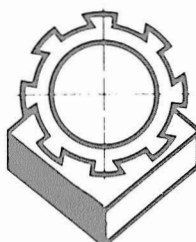
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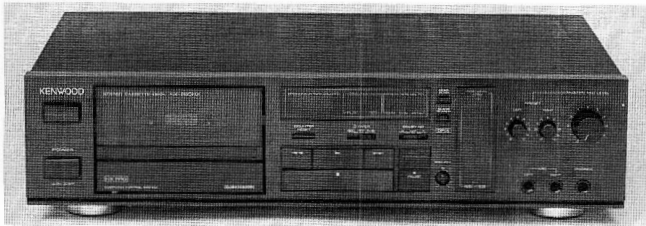
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# THE DIRECTORY

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

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

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

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

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

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

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

Perhaps the most influential letters in the Directory are those found in the Value column, the *As* and *Bs* 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 electromechanical elements – ie cartridge and speaker) system building is not quite that simple. These ratings make a useful guideline for shortlisting components, but only experiencing the actual combination will tell you whether it works for you.

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

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

## SYSTEM BUILDING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## THE DIRECTORY

## TURNTABLES &amp; TONEARMS

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

Specialist turntables offer big sound quality

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

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

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

## INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research EB101 £230	Good Good	This genuine high fidelity product offers an impressive package at a competitive price	Subchassis, manual, 13.5g	BB	48
Alphason Solo/Xenon MCS £365/£262	Average+ Good	The deck is warm and euphonious with high levels of clarity. Wow artefacts occasionally just audible.	3 point suspended motor unit, optional quartz PSU/speed change 13g		67
Alphason Sonata/HR-100S-MCS £720/£480	Excellent Very Good	Highly capable audiophile system with real resolution and control. Bass is powerful and dynamic ability unbridled	Manual, subchassis, belt drive, 10g	R	60
Ariston Q-Deck £150	Good Average+	Well engineered and good sounding low cost package which is both easy to set up and to use	Semi-auto, belt drive, solid	BB	67
Ariston Forte £350	Average- Average	Heavy on engineering, short of soul? The Forte almost makes it, losing out only because of some residual pitch variations and a lack of bass power. The arm is modestly good	Manual 2-speed belt drive player and detachable arm, 10g		67
Dual CS430 £89	Average Average-	Ragged, sometimes unpleasant cartridge mixes with a modest pleasing player in a very sharply priced package.	Belt drive, with cartridge, auto return, 5g	R	67
Dual CS503-1 £114	Poor Average	Slated as a replacement for the CS505, the 503-1 needs careful system matching to mask rumble and microphony, but is good enough to benefit from a better cartridge	Semi auto, belt drive, low mass arm	R	55
Dual CS505-3 £139	Very Good Good	Continuous steady improvements have kept this model at the forefront of the budget market. Practicality is excellent and the deck has excellent timing bass/mid and stereo imaging	Semi-auto belt-drive, 8g	BB	67
Dual CS5000 £200	Average Average+	The rare 78 facility may give grandma's collection a new lease of life but the player did not merit recommendation on price vs sound	Electronic, belt drive, subchassis, 10g		48
Goldmund ST4 £4,550	Very Good Excellent	The Studio turntable takes on a cheaper tonearm than the T3F, yet provides a similar reference standard objective and subjective performance at £2,000 less, in a neatly integrated though bulky package.	Solid subchassis, direct drive, parallel arm, detachable headshell	R	60
Heybrook TT2 turntable & arm £349/£249	Average Good+	A gradual process of informed evolution and a sensibly designed arm combine to make this a good sounding middle of the road package. Well supported by dealers	Manual subchassis motor with arm, belt drive, 14g	R	67
JVC AL-FQ555 £170	Below Average Poor	Clear midband sound but woolly bass and crude treble. Ease of use however ranks highly, and there's little to go out of adjustment	Auto, direct drive, 5.5g		67
Kenwood DP-990 £300	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 £575/£349	Average+ Stabi: Good; Stogi: Excellent	Stabi is powerful, spacious but not sufficiently subtle. Stogi is an excellent all rounder with even spread of abilities.	Manual, belt drive, subchassis. 12.5g	Stogi: R	60
Linn Axis £379	Good+ Good+	Setting new performance-for-price standards this cleverly engineered and competent deck has many of the qualities of the Sondek LP12; arm has been upgraded to Akito since this review	Electronic, belt drive, semi subchassis, 13g	BB	48/Coll
Linn Sondek/Ittok/Troika £509/£429/£669	Excellent Very Good	Superb sound – the best LP12 combination yet. The Troika gives the system real solidity and strength, stretching the deck and arm qualities to the full	Manual subchassis player, belt drive, 14g	R	60
Manticore Mantra £325/£403 (Arm)	Good+ Good+	Fitted with a Rega RB250 arm variant and AT95E cartridge the Mantra fared very well indeed with a fine midrange and good focus	Subchassis, 12g, manual	BB	48/Coll
NAD5120 £89	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/Decca London International (Revised) £399/£99	Poor Good	Heavyweight motor unit with many fine properties, but which needs further development. The idiosyncratic arm is a suitable (though not ideal) platform for the Decca cartridge. For all its faults though, the whole transcends the sum of the parts	Belt-drive manual, damped unipivot arm, 12g		67
Rega Planar 2 £155	Average+ Good	A remarkable product at the price, surprisingly articulate and confident	Integrated turntable, manual, 11.5g	BB	48
Rega Planar 3 £207	Good Good	A long time leader in its price category, the '3 (with its excellent RB300 arm) sounded nicely 'musical' in a balanced and coherent manner	Integrated turntable, manual, 11.5g	BB	48
Revolver Rebel £160	Average- Average-	Fat, assured and forward presentation, but ragged and subjective speed stability problems. With a little further development, it will be a winner	Manual, 2-speed belt drive inc cartridge, 13g		67
Revox B291 £660	Average- Average-	Sound quality ranks as below average. Subjective bandwidth is narrow and the music lacks grace and energy. Ease of use however is unrivalled	Automatic, remote controllable, direct drive parallel arm, prefitted cartridge		55
Roksan Xerxes/Artemiz/Shiraz £695, £495, £595	n/a Very Good	Imaginatively designed, sophisticated front-end system, a little drier than some perhaps, with superior stereo, resolution and presence	2-speed manual, MC cartridge, 9g	R	72
Sansui SR-222 Mk V £159	Average- Average	More than acceptable in most areas, the Sansui is detailed and positive, though a little muddled when stressed. Best suited to low compliance cartridges	Manual 2-speed belt drive, 16g		67
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 SLBD-22 £90	Average- Average-	Not bad for the price and a great improvement on the L20, it performs reasonably when not stretched	Semi automatic, solid plinth, electronic, 6g P-mount	R	48
Technics SL-DD33 £110	Average Average	As with the QD33 though better value	Automatic, direct drive, solid plinth, 7.5g, P-mount	BB	48
Technics SL-L20 £115	Poor Average-	A rather lightweight parallel tracker achieving a poor overall rating, with little to recommend it unless you dig facilities	Electronic, solid plinth, 5g, P-mount		48

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## INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Technics SL-QD33 £140	Average Average	The quartz speed controlled version of the DD is short on sound quality but not features. But it did have fair focus and some depth	Automatic, Quartz, direct drive, solid plinth, 7.5g, P-mount	R	48
Thorens TD280 £150	Average Average	Extremely competitively priced package with a trace of lower-mid overhang, but it's very well behaved elsewhere	Semi-auto belt-drive 2-speed, 13g	BB	67
Thorens TD166 Mk II £179	Average Average+	A polished and professional design consisting of a first rate budget suspended subchassis turntable and a mildly disappointing arm	Manual 2-speed, 13g	BB	67
Thorens 160S Mk IV £249	Average+ Average+	Fine, familiar suspended player and arm. Faults are few, but include poor arm bearing adjustment. The arm can sound a little messy	Manual 2-speed, 1g	R	67
Thorens TD320 Mk II £349	Good Good	Good, consistent sounding deck with much improved (but not ideal) arm. A little expensive for performance offered	Semi-auto two speed belt drive, 14g		67
Well Tempered Turntable & Arm £1690	Average Very Good	Intriguing and challenging design. Musically it is not ideal, but it has a limpid quality and a lack of artificiality that sets standards as well as turning the ear, though it's not completely uncoloured. A charmer yet mainstream enough in its virtues to be viable	Manual 2-speed, damped, suspended arm, 7.5g	R	67
Zarathustra S4/Pluto 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

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ariston RD90 Superior £900	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
Michell Syncro £265	Good Good	A particularly happy blend of qualities endows the Synchro 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
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
NVA Turntable £499	Average Good	A surprisingly fast and assured performer, but with lightweight bass and a little aggressive. Easy to set up, the price (necessarily) includes stand	Manual, belt drive subchassis, stand, 33 $\frac{1}{3}$ rpm		60
Oracle Alexandria Mk III £825 – £995	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 Delphi III £1450	Very Good Very Good	Stable imaging, good bass and refined detail, it's well made and consistent in service – but very expensive	Manual, belt drive, subchassis	R	60
Oxford Acoustics Crystal Reference £1995	Very Good Excellent	This big, open and powerful sounding turntable works beautifully with Airtangent arm to give superb 3-D imagery	Manual, belt drive, subchassis, stand	R	60
Pink Triangle PT T00 £650	Good Very Good	A state of the art player, easy to set up but extremely fussy about partnering equipment and state of tune. The test sample suffered flutter derived roughness (presumed not typical)	Manual 2-speed, outboard PSU	R	67
Rega Split Slab Modification Kit £74	Good Good	Clever and cheap upgrade kit that protects the initial investment and which adds clarity and environmental isolation to a fine but microphonic original	Conversion suspended chassis kit for Rega 2/3		67
Roksan Xerxes £695	Excellent Very Good	This unique design cuts a swathe through the conventions of turntable design, providing superb resolution and stereo. Like all sophisticated decks, setting up is best left to a dealer	Manual, belt drive, solid/decoupled	R	67
SEE Revolver £135	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
Thorens TD521 £629	Average Average+	Nice product. Unexciting, rather undynamic and insubstantial sound quality, but facilities such as ability to accommodate 12 inch arm compensate	Manual, belt, suspended motor unit, 78rpm, pitch control,		55
Voyd "The Voyd Plus" £2,522	n/a Excellent	Based on the standard 3-motor Voyd but with upgrade options (better bearing, platter, etc) which take it half way to a Voyd Reference, so we've dubbed it The Voyd Plus. Superb build and finish; colourful, dramatic performance. A thoroughbred	Belt drive, 3 motors, subchassis, outboard PSU	R	72

## TONEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Alphason Opal £110	Good Average	This is a straightforward adequate sounding low cost arm, priced just above where it rightly belongs	10g		55
Alphason Delta £165	Good Average+	A highly competent design from Alphason gives good sound quality but with slight blurring and treble fizz	16g	R	48
Alphason Xenon £210	Good Good+	A trimmed down HR100S, the Xenon has inferior bearings and a simpler finish, but sounds crisp and coherent. Fits any Linn cutout	12.75g	R	55
Alphason HR100S £395	Good+ + Very Good	This S-shaped arm sounds smooth, but nevertheless reproduces transients with fine attack	10g	R	48/Coll
Ariston Enigma £99	Average Average+	Good but not the best in its class: mid-band sounds a little uneven; treble a trifle "brash"	11.5g		48
Audio Technica AT1130 £186	Good Good	Well suited to most cartridges including high compliance ones, the AT is smooth and tonally neutral, if slightly lacking in "balls"	8.5g	R	67
Decca International £49	Average+ Average+	This uni-pivot design gives a rather rich tonal balance and some bass muddling. Could be good with Decca cartridges, but not well built	12g		48/Summary
Eminent Technology £1000	Good+ + Good+ +	One of the best sounding tonearms around, the linear tracking Eminent delivers impressive stereo imagery, focus and transparent sound	9g (vertical)	R	48/Coll
Goldmund T3F arm £3950	Excellent Excellent	This complex parallel tracker created an "ear-opening" experience when tested with a (since updated) Goldmund Studio turntable	16.5g	R	Coll 2
Grace G707 £299	Good Good+	This venerable is still capable, if not competitive with modern alternatives	7g		48
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
Linn Ittok LVII £429	Very Good Good+	Suitable for many turntables this top-quality arm performs best with the LP12, the combination exceeding the sum of both parts	13.5g	R	48/Coll
Linn Ekos £895	Very Good Very Good	Superb, state of the art design which builds significantly on Ittok's strengths	9g	R	67

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## TONEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Mission Mechanic £900	Good Good+	Nearly right, but inconsistency with level and vague imagery spoil what is otherwise a firm, powerful advocate for black vinyl	11g		55
Moth Arm £78	Good Good+	The ultimate budget arm? Refined, detailed, sweet and natural – performance improves in line with the rest of the system	12g	BB	60
Rega RB300 £115	Good++ Good++	Despite its modest price this sets exceptional performance standards and could be used on a number of high-quality turntables	10-11g	BB	60
Roksan Artemiz £495	Average Good	Interesting design which works a treat on the Xerxes deck. Fits Rega cut-out. See issue 72 for up to date assessment	8g		67
SME 3009 Series IIIS £165	Good Average+	A simplified less flexible (as regards adjustment) Series III with a similarly 'soft' sonic character	5g		48
SME 3009 Series III £229	Good Average+	Comprehensively adjustable and very well made, suited to MM and high compliance MC cartridges	5g		48
SME 3009R £291	Average+ Average+	A higher mass version of the Series III designed for low compliance MC cartridges	12g		48
SME Series IV £810	Excellent Very Good	Superb engineering and finish with a finely balanced sound giving impressive stereo focus and low coloration	10.5g	R	60
SME Series V £1206	Excellent Very Good	Excellent in terms of design engineering and sound quality, this arm arguably sets a new reference standard regardless of price	10.5g	R	60
Souther Tri-Quartz £895	Average Good	A unique parallel tracking arm that makes up for what it lacks sonically in its unusual appearance	3-4g		48

## CARTRIDGES

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

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

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

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Arcam C77 £22	Average+ Average+	A sensible moving magnet package with good bounce at a competitive price	6-16g Normal, MM	BB	48
Arcam C77Mg £30	Average— Average	Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8g Normal, MM	BB	67
Arcam E77Mg £50	Average Average	Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8g Normal, MM	R	48
Arcam P77Mg £60	Average+ Average+	Cautiously recommended, the P77Mg was preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9g Normal, MM	R	48
Audionote I02VDH £795	Good Very Good	One of the best, giving 'an extraordinarily relaxing midrange clarity'. But it picked up a bit of surface noise and dust and needs a transformer	8-18g Very low (transformer), MC	R	43
Audioquest MC5 £220	Average Average	Offers high-output benefits but the drooping frequency response and severe VTA error preclude recommendation	10-20g Normal, MC		54
Audio Technica AT95E £17	Average— Average	Clear, dynamic if richly balanced, the magnetic '95E is a definite Best Buy	8-14g Normal, MM	BB	48
Audio Technica AT-420E OCC £30	Average Average	Better suited to pop recordings this MM bears some of the sonic hallmarks of the Linn K5	7-14g (damp) Normal, MM	R	67
Audio Technica AT-430E OCC £42	Average+ Average	A rising high frequency response yields something of a treble sting, not a good all-rounder	3-7g Normal, MM		67
Audio Technica AT-F3/OCC LE £70	Average+ Good	Though the 'limited edition' badge is a trifle tongue-in-cheek the 'F3 still offers excellent value	8-15g Low, MC	BB	67
Audio Technica AT-F5OCC £100	Average+ Good	Decent output, good channel balance and a thoroughly refined sound sets the standard at £100	9-20g Low, MC	BB	54
Audio Technica AT-F5/OCC LE £100	Average Good+	This latest sample demonstrated some technical weaknesses but its spacious, fluid sound quality still represents a benchmark at this price	4-10g Low, MC	BB	67
Audio Technica ATOC7 £250	Good+ Good+	The OC9 is better if you can afford the extra. But OC7 is at least a taste of the high-end at a sensible price	6-13g Low, MC	R	54
Audio Technica ATOC9 £400	Average+ Very Good	Tonal colours are reproduced faithfully and it rarely puts a foot wrong. Slightly less transparent than more costly MCs but it has got real wellie. Good value (really!)	6-14g Low, MC	R	60
Audio Technica ART1 £800	Good+ Very Good	This is a delicate and very fluid-sounding MC that tracks well, offers very low distortion and exceptionally good stereo separation	9-18g Low, MC	R	72
Azden YM10VE £12.50	Average Average—	A good tracker. Sounds rather bunched-up but not totally incoherent – for very basic systems only	5-15g Normal, MM		54
Azden GM1E £30	Average— Average—	Of academic interest only, this high o/p MC is seriously flawed in sonic terms	8-18g Low/normal, MC		54
Azden GMP5L £108	Average+ Average+	Although no P-mount system will do this cartridge justice, it can still be enjoyed in its universal mode. The subtle balance may prove irresistible to some	4-10g Low, MC	R	54
B&O MMC5 £24	Average+ Average	Cheapest in the family – smooth treble and good focus, but the bass was left in the wings	5-15g Normal, MM		38 (Summary)
B&O MMC4 £43	Good Average+	Solid and well balanced in the midrange, the '4 lacks bass impact	5-15g Normal, MM		48
B&O MMC3 £57	Good Average	Slightly "laid back" sound quality but a good performer for the price. Best suited to B&O equipment	5-15g Normal, MM		48
B&O MMC2 £87	Good Average+	Only a modest improvement on its cheaper brothers (and sisters)	5-15g Normal, MM		48

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## CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
<b>B&amp;O MMC1</b> £112	Very Good Good	Great clarity and detail at high frequencies but a slightly plodding bass. It may appeal more to the classical enthusiast	5-13g Normal, MM		48
<b>Cello Chorale</b> £590	Average+ Good	Now available through a new distributor at a saving of some £300, the Chorale is still blessed with a delicate but highly detailed treble. Arm matching is a problem	3-9g Low, MC		72
<b>Clear Audio Gamma</b> £295	Average Average+	Brimming over with enthusiasm, the unusual-looking Gamma is more than an audio oddity, but it lacks a little subtlety at times	4-11g Low, MC		54
<b>Clear Audio Delta</b> £450	Average+ Good	Midway between the Gamma and exotic Pradikat, the Delta sounds like neither! Nevertheless, it delivers the goods	6-17g Low, MC	R	54
<b>Clear Audio Signature</b> £995	Average+ Good	This latest MC to emerge from Clearaudio features yet another graded version of its proprietary generator. Its sound strikes a balance between the Delta and Prad	4-11g Low, MC		72
<b>Clear Audio Pradikat</b> £1225	Average+ Very Good	Sounded absolutely glorious, creating a full sense of scale and a large well-focused soundstage – but watch for record wear	8-18g MC		Coll
<b>Clear Audio Accurate</b> £2,000	Good Excellent	A remarkable cartridge, not only by virtue of its effortless and highly neutral sound quality but also because this has been achieved with the same basic design as Clearaudio's cheapest MCs	4-11g Low, MC	R	60
<b>Denon DL110</b> £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
<b>Denon DL160</b> £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
<b>Denon DL 103</b> £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
<b>Dynavector DV-50X</b> £60	Good Average	A high-output MC model with impressive lab performance, but whose tip and sound quality both disappointed	6-14g Normal, MC		48
<b>Dynavector DV10X IV</b> £60	Average Average+	Fine sounding and realistically priced, damping is recommended to ensure successful tracking ability	8-18g Normal, MC	R	48
<b>Dynavector DV23RS</b> £150	Average+ Good	Sound quality was described as "shut-in", lacking energy and sparkle but with some "edginess" in high frequencies	10-22g Low, MC		28
<b>Dynavector DV XX-1</b> £360	Good Good+	The XX-1 embodies a power and solidity rarely encountered amongst the breed, nevertheless it did exhibit a peculiarly suppressed character that will suit lively rather than wholly neutral systems	7-17g Normal, MC		60
<b>Empire 800 Mk II</b> £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
<b>Empire MC-5M</b> £110	Average+ Good	A very low compliance renders this MC best suited to heavy tonearms while its sweet, non-aggressive sound quality earns it a recommendation	13-20g Low, MC	R	67
<b>Empire Benz Micro MC-2</b> £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
<b>Glanz MFG 110EX</b> £24	Average Average	A little bright but giving detailed bass and clear treble this was competitive at the price	6-16g Normal, MM	R	Systems
<b>Glanz GMC-10EH</b> £49	Good Good	The rising HF trend of this high o/p MC may cause problems in certain systems but with a favourable wind its seductive qualities will win out	8-14g Normal, MC	R	67
<b>Glanz GMC-10LX</b> £79	Average+ Average+	Bearing some of the hallmarks of the '10EH, the '10LX is still less competitive in the sonic stakes	7-15g Low, MC		67
<b>Glanz GMC20E</b> £129	Average Average	You could try hagglng but we thought the makers of this number were demanding too much lucre for their product	3-6g Low, MC		48
<b>Goldmund Clearaudio</b> £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
<b>Goldring Elan</b> £15	Average+ Average	A lightweight and frisky-sounding MM that appears to be based upon the same body as the Nagaoka mm4	7-15g Normal, MM	R	67
<b>Goldring Epic II</b> £23	Average Average+	An excellent budget choice though the limitations of the stylus are rather obvious at higher frequencies	5-12g Normal, MM	R	67
<b>Goldring G1020</b> £53	Average+ Average-	This one strutted finely onto stage but couldn't project to the "gods"	8-16g Normal, MM		43
<b>Goldring G1040</b> £79	Average+ Average-	High frequency extension was improved by the van den Hul tip, nice looking model – no great actress	8-16g Normal, MM		48
<b>Goldring Eroica L</b> £95	Average Average+	Open and relaxed sounding, the L version is just that bit more refined than its high output brother	7-18g Low, MC	R	54
<b>Goldring Electro II</b> £149 complete	Average Average+	A pretty decent allrounder; a good cartridge, in fact – but a bit pricey	8-16g Normal, MC		43
<b>Goldring Excel</b> £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
<b>Grace F9E II</b> £240	Good Good	For lively presentation, excellent separation and generally satisfactory sonic delivery – consider this model	5-10g Normal, MM		48
<b>Grado XTE +1</b> £22.50	Average- Average	Bass and treble are a trifle coloured but the midband proved highly enjoyable. Ideal for budget systems	6-13g (damping) Normal, MM	R	54
<b>Grado XF3E +</b> £43	Average- Average	Downtilting balance disguises the brightness of this cartridge; bit of a mixed bag at this price	9-20g (damping) Normal, MM		54
<b>Highphonic MCA3</b> £360	Very Good Good+	Exquisitely crafted by a group of ex-Denon engineers, this superb tracker had a sweet and seductive (if rather bright) treble	5-12g Low, MC		43
<b>Kiseki Blue Silver Spot</b> £395	Average+ Good	Solid performance from a very solid cartridge but lacks some of the magic of other Kisekis. Compliance too high	5-12g Low, MC		54
<b>Kiseki Purpleheart Sapphire</b> £695	Good+ Good+	Rare, beautiful to look at and sweet to listen to, our review of this high-flyer conjured up images of Japanese art	5-14g Low, MC		Collection
<b>Kiseki Blackheart</b> £1595	Good Good	This cartridge demonstrated refined poise and a delicate but at once potent security, however, the price did seem a little on the high side compared to other Kisekis	6-16g Low, MC		60
<b>Kiseki Lapis Lazuli</b> £3500	Good Very Good	Combining very sensible design concepts at a silly price, the Lapis Lazuli is best thought of as combining the detail of the MC3000 and the fluidity of the Clearaudios	4-12g Low, MC		60
<b>Koetsu Black S</b> £599	Average Good+	The S is an OEM design built to Koetsu's blueprint. It features a sturdier fixing plate and offers a brighter, faster and more tactile sound than the earlier K	8-15g Low, MC	R	72
<b>Koetsu Red</b> £896	Good+ Very Good	Named like a rare, and perhaps dangerous, little oriental fish this famous cartridge sounded "almost larger than life"	10-25g Low, MC	R	48/Coll
<b>Koetsu Red Signature</b> £1391	Good Excellent	Technically this cartridge suffers no faults whilst on a subjective level it offers rare musical insight	10-21g Low, MC	R	60

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## CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
<b>Krell KC-100</b> £700	Average Good	Apparently based around a similar generator as the Cello Chorale, the Krell provides a similarly light and airy sound. Low mass arms with damping are best used	3-9g Low, MC		72
<b>Linn K5</b> £30	Average Average+	Not as crisply focused as the costlier Linn magnetics, the K5 offers a smoother presentation	7-16g Normal, MM	R	67
<b>Linn K9</b> £75	Average Good	Linn threw this model into the leading pack by beefing up the Basik's bodywork, adding a super stylus, and keeping the price fair	6-15g Normal, MM	BB	48/Coll
<b>Linn Asaka</b> £299	Good+ Good+	Disciples of Linn who are trying to realise their true "Karma" may find that saving money is not a short cut to heaven	9-18g Low, MC	R	48/Coll
<b>Linn Karma</b> £435	Very Good Very Good	A specialist which is strongly recommended for Linn-based systems; results may be less predictable in more general application	9-18g Low, MC	R	48/Coll
<b>Linn Troika</b> £669	N/A Very Good	Ex-Karma users have been seen with glazed expressions indicating smug self-indulgence the morning after fitting a Troika	8-18g Low, MC		Coll
<b>London Maroon</b> £109	Average Average+	Now manufactured under the London brandname this Decca cartridge is as iconoclastic as ever	9-20g (damp) Normal, MM		67
<b>London Super Gold</b> £248	Average- Good+	Sometimes a bit fierce in emphasising record surface faults, it is perhaps best at revealing the excitement and tension in music	8-20g + damping Normal, MM	R	48/Coll
<b>Madrigal Carnegie One</b> £685	Average+ Good	Looks like a duck but sounds much better, certainly worth auditioning. Compliance too high	5-11g Low, MC		54
<b>Milltek Aurora</b> £198	Good+ Good+	An overall feeling of relaxed ease characterised this clear and atmospheric Kiseki-built cartridge	8-16g Normal, MC	R	48/Coll
<b>Milltek Olympia</b> £298	Average+ Good+	Warm and detailed sound - packs the punch of the best MCs with high output as a bonus	12-20g (damping) Normal, MC	R	54
<b>Mission 773HC</b> £150	Good Good	A sufficiently well-balanced and competitively priced "old-timer" which still warrants recommendation	6-16g Low, MC	R	38
<b>Monster Alpha 2</b> £479	Good Good+	In the final analysis this fine allrounder is insufficiently exceptional in any specific respect to justify fully its high price	6-14g Low, MC		Collection
<b>Nagaoka MM4</b> £8	Average- Average-	Clear punchy sound that delivers the rudiments of a good performance	6-16g Normal, MM	R	54
<b>Nagaoka MP10</b> £17	Average Average	High frequencies sounded "shut-in" with this spherical-stylus model, but mid and mass were energetic, bouncy and punchy	5-13g Normal, MM	R	48
<b>Nagaoka MP11 Boron</b> £38	Average Average+	Responding well overall in PM's equipment and listening room, this model was mildly criticised for low level and dynamic limitations	5-13g Normal, MM	BB	48
<b>Nagaoka MP10SB</b> £40	Average Average+	Stilton's mods have improved the fine detail resolution of this popular budget model	5-15g Normal, MM	R	54
<b>Nagaoka MP11 Gold</b> £45	Average- Average+	There were mild criticisms directed at most areas, but in general the sound was clear, open and even	3-8g Normal, MM	R	48
<b>Nagaoka MP11 Gold SB</b> £70	Average- Average	Excessive price loading for a blob of aluminium	2-6g Normal, MM		54
<b>Ortofon OM5E</b> £15	Average- Average-	The OM10 is a hi-fi cartridge - the OM5E is not	5-16g Normal, MM		43
<b>Ortofon VMS5E II</b> £14	Average Average	Sound quality was thought fair for the price, though a little 'untidy'	8-18g Normal, MM		38 (Summary)
<b>Ortofon OM10</b> £20	Average Average	One of the leading "cheapies", this gives a fine level of sound quality for the price, with good matching compatibility	5-15g Normal, MM	BB	48
<b>Ortofon VMS 10E II</b> £21	Average- Average-	Some of its stablemates fared rather better, and showed less evidence of tracking problems to boot	Normal, MM		38
<b>Ortofon VMS20E II</b> £35	Average Average	One of the most popular cartridges ever, sound quality was a bit laid-back and tracking could have been better	3-10g Normal, MM		48
<b>Ortofon OM20</b> £40	Average Average+	This turned out to be the listening panel's favourite among Ortofon's moving magnet models	5-16g Normal, MM	R	48
<b>Ortofon 520</b> £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
<b>Ortofon X1</b> £50	Average Average	The cheaper X1 scored higher marks with our listening panel than the X3, but both were a disappointment	6-15g Normal, MC		48
<b>Ortofon VMS30E II</b> £52	Average+ Average	Rather an old soldier in relation to turntable technology, it will perform undemandingly in demanding circumstances	5-13g Normal, MM		38
<b>Ortofon MC10 Super</b> £70	Average Good	"What a delightfully sweet-sounding cartridge this is..." we said	5-15g Low, MC	BB	48
<b>Ortofon X3</b> £70	Average Average	A lack of bass power, definition and a "zitty" top end makes this competent but uninvolved	5-15g Normal, MC		48
<b>Ortofon OM40</b> £80	Average Average+	Highly competent engineering, secure tracking and decent sound quality are major strengths. But it's a little cold, a little polite	3-8g Normal, MM		48
<b>Ortofon 540</b> £100	Average- Average	Graced with an advanced FGI stylus our sample possessed too high a compliance for broad arm matching. It could also sound a little unforgiving	3-8g Normal, MM		67
<b>Ortofon MC20 Super</b> £170	Average+ Good+	An "inviting" sound quality; polite rather than exciting it approaches much more expensive models, but does not better them	6-15g Low, MC	R	48/Coll
<b>Ortofon MC30 Super</b> £250	Very Good Good+	Beautifully engineered and well-balanced, it was slightly criticised as bland, though some may appreciate the lack of rough edges	5-14g Low, MC		Coll
<b>Ortofon MC3000</b> £800	Good Excellent	Quite simply, the most accurate transcription device yet created - not one for the faint hearted	6-16g V. Low, MC	R	60
<b>RATA RP20</b> £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
<b>RATA RP40</b> £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
<b>RATA RP70</b> £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
<b>RATA RP70vdH</b> £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
<b>Rega Bias</b> £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
<b>Rega RB100</b> £38	Average Average+	Remarkable mechanical performance in the right system context, but "try before you buy"	5-12g Normal, MM	R	48

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## CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Rega Elys £74	Good Good	Clearly superior to the Bias, despite their common heritage, the Elys is both more detailed, accurate and musically convincing	8-15g Normal, MM	R	67
Revolver £20	Average+ Average	This modified AT-95E enjoys a very lively mid and treble even if the bass is somewhat 'slower' in protection. A firm budget buy	8-16g Normal, MM	BB	67
Shure M92E £15	Average- Average	Though lacking depth, the overall sound quality was competent, but treble was not its forte	10-15g Normal, MM		43
Shure M99E £26	Average- Average-	Sister to the 92E this is a solid but not particularly exciting cartridge	5-10g Normal, MM		38 (Summary)
Shure ME75ED £24	Average Average-	Rather bright and splashy in the high frequencies but nevertheless a competent model	5-10g Normal, MM		38
Shure M104E £32	Average- Average	Capable in many ways, but giving no substantial improvement over the 92E in our view	5-15g Normal, MM		38
Shure ME97HE £44	Average Average+	It won't turn a sow's ear of a turntable into a silk purse, but will at least keep going and produce an acceptable result	8-20g Normal, MM	R	48
Shure M105E £45	Average Average-	A slightly 'spitty' sound lacking deep bass and dynamic contrast, but can be used in virtually every system where it will perform "unobtrusively"	5-12g Normal, MM		38 (Summary)
Shure M110HE £55	Average Average	Sound quality was thought eminently presentable, but not exciting; smooth clear high frequencies, but a loss of bass definition	5-10g Normal, MM		38 (Summary)
Shure M111HE £67	Average Average	Early reviews of this cartridge complained principally of the price - which has since come down	5-10g Normal, MM		38 (Summary)
Shure ML120HE £95	Average+ Average+	Quite decent sound quality and a generally fine balanced performance	6-18g Normal, MM		48
Shure ML140HE £120	Average+ Good	Qualitatively the treble of this well-balanced moving magnet model was a match for many moving coil cartridges	6-16g Normal, MM		43
Shure V15 VMR £195	Good Average+	Initial listening gave promising results, but extended familiarity gave the feeling of a lack of energy and a "shut-in" sound	5-12g Normal, MM		38
Shure Ultra 500 £452	Good Good	There was no doubting the accomplishments of what could well be the finest moving magnet cartridge around	6-14g Normal, MM		48
Stilton/AT-F3 £110	Good+ Good+	At a premium of some £40 this modified AT-F3 offers a startlingly refined performance and is strongly recommended	8-18g Low, MC	R	67
Supex SM100E £115	Average Average+	Delivers as much musical information as many moving coils - the bass in particular having an attractive bounce	6-15g Normal, MM		38
Supex SD900IV £350	Average+ Good+	The 900 is an inherently fine cartridge, but despite a recent update it is beginning to show its age	10-18g Low, MC		48/Coll
Supex SD901IV £375	Average+ Good+	This high output model delivered sufficient subjective and objective performance, plus good compatibility, to justify its price tag	8-18g Normal, MC	R	48
Supex SDX2000 £651 L £721 H	Good Good+	The high-o/p 2000 was preferred on listening tests to the low-o/p model, which even so has a unique place among the top designs	6-16g Either, MC		48
van den Hul MC10 £699	Good Good+	A neutral balanced performer giving transparent midrange, fine depth and focus with firm extended bass. Gosh!	5-10g Low, MC	R	60
van den Hul MC One £699	Good Very Good	This extended all the positive qualities of the '10 but added greater authority and scale - worth it for the extra money	6-12g Low, MC	R	60
van den Hul MC Two £899	Good Very Good	Connected directly to any standard MM input the vdH MC Two rewards with a highly detailed yet fluid and musically convincing portrayal	6-13g Normal, MC	R	72

\* rating refers to original tested model

## AMPLIFIERS

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

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

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

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

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

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research A03 £160	Average+ Average	New slimmed down version of the A04 with less power and facilities but also a slightly 'fuzzy' sound	38W, MM disc, CD direct and 3 aux inputs		74
Acoustic Research A07 £280	Very Good Average+	Relatively smooth but ineffectual sound quality that lacks some weight and impetus at very low frequencies	75W, 4 line, 2AV and MM/MC inputs		68
ADC A-2080E £400	Good+ Average+	Clean and neutral sound but one that lacked depth and spaciousness; MM input favoured above MC or CD	108W, logic sw. for 5 line and MM/MC inputs		68
Akai AM-52 £230	Average+ Average-	Basically equipped, this amplifier offers a comfortable but hardly over-detailed sound	95W, MM/MC disc, 5 line inputs, loudness		74
Akai AM-93 £550	Average Average-	Unfortunately Akai's on-board D/A convertors were less successful than its conventional analogue CD input.	112W, coax and optical dig inputs. MM/MC		68
Albarray M408 II £895 pr.	Good+ Good+	Unusually styled transistor monoblok power amplifiers reintroduced with improved performance and sound quality. Needs good warm-up for best sweetness and clarity	40W Power amp only	R	56
Albarray MI 008 II £1095	Very Good Good	A larger version of the similarly styled M408II, fairly good all round but only of average quality for the price	80W, monoblok		62
Amadeus Gold £360	Average- Good	There is some indication of instability but otherwise sounds very rich, warm and musical. High-ish IMD.	56W, MM/MC plug-in cards, 3 line inputs	R	74

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## AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Analogue Electronics PR3/PA4 £280/£280	Poor— Fair	Our samples, though certainly not prototypes, were technically compromised. Preamp sounds very bass light while the power amp sounds very coarse	29W, MM/MC, separate source and record out, recessed 4mm sockets		74
Aragon 4004 £1795	Good Good	Despite its imposing bulk the Aragon is something of a softy at heart. It can deliver oodles of power but its musical presentation is more laid-back	231W power amp		72
Arcam Alpha II £170	Good Good+	Very confident, convincingly musical and punchy sound that sets the standard for other budget amps	41W, 4 line and MM inputs	BB	68
Arcam Delta 60 £260	Good Good+	Very refined and highly detailed sound via MM and CD without any of the hardness noted via the MC stage	59W, 4 line, MM/MC inputs, no tone controls	R	68
Arcam Delta 90.2 £350	Average+ Average+	Dark but slightly dead or conservative sounding version of the original Delta 90. Improved disc stage	73W, MM/MC, 4 line inputs, tone bypass, bi-wire	R	74
Ariston Amp £180-200	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 300 £425	Poor Good++	Something of an anomaly the 300 is an integrated valve amp that looks awful in the lab but sounds remarkable in a system	10W, MM, 6 inputs	BB	63
Audio Innovations Series 1000/2nd Audio Amplifier £1299/£2250	Poor Excellent	This valve combination offered awesome dynamic range with superb transparency and power to match. Compatibility with other brands is unpredictable	15W, MM, 6 inputs, monoblocks	R	63
Audio Research SP9 £1698	Very Good Very Good	This new high performance valve FET hybrid preamplifier sets a high standard for versatility, build quality and sound	5 inputs, MM/MC	R	60
Audio Research SP11 II £5250	Very Good Excellent	Current state of the valve preamp art. A reference point	Straight line MM/MC Disc + phase invert	R	60
Audiolab 8000C £325	Excellent Good	A well established preamp with a highly controlled sound, though it could do with more life and depth	MM/MC, 5 inputs, hdph, tone controls	R	62
Audiolab 8000A £350	Very Good Good+	Exceptionally detailed, tactile and transparent via CD but slightly more clouded via disc. A stalwart design	72W, MM/MC, 4 line and full record out selection	R	74
Audiolab 8000P £495	Excellent Good+	A dynamic powerhouse, load tolerant and sonically reliable	100W	R	62
Beard Audio CA35/P35mkII £595/£795	Fair+ Very Good	Good build quality and a very smart finish combine with a characteristic valve sound to make a first class amplifier capable of giving hours of musical enjoyment	35W, MM/MC, 4 inputs	R	63
Beard 506 £1195	Good+ Good+	A versatile valve preamp – the bass sounded lively if a touch softened while the treble was detailed but lacked a little sparkle and air.	4 inputs MM/MC		50
Beard M70 £1995 pair	Good Good+	A substantial British monoblock power amplifier, but not a great deal more impressive than the P35 at half the price	70W		50
Bryston 0.5B/2B £595/£695	Very Good Good	Very rugged Canadian pre/power combo that sounds cool confident and punchy. Headamp available to suit MC cartridges	65W, MM and 4 line sources, overload LEDs on power amp	R	74
Bryston 12B/4B Pre/Power £995/£1395	Good+ Good	Bryston's massive 4B power amp stood out as the backbone of this combo, the preamp sounding a trifle unbalanced between MM and MC inputs	272W, bridgeable to 800W. 6 line, 2 disc inputs, subsonic filter	R	68
Cambridge Audio P40 £200	Good Good+	A very fine sounding integrated amplifier with simple facilities and MC cartridge capability	5 inputs 40W MM/MC straight line	BB	50
Cambridge Audio C75 £279	Good+ Good+	Whilst not quite on par with its A75 companion this preamp provided excellent stereo imagery but was a touch "heavy" in character	MM/MC disc	R	50
Cambridge Audio P55 £290	Very Good Very Good	A grown up P40, the P55 suffers slight noise on the moving coil input but offers great sound for the money	55W, MM/MC, 5 inputs, hdph	BB	62
Cambridge Audio A75 £299	Very Good Very Good	This strong power amplifier sounded open and effortless, with fine bass drive and dynamics, albeit a touch grainy and harsh at high frequencies	100W	R	50
Cello Audio Suite £5280	Excellent V Good/Excellent	Cello's preamp represents a whole new ball game in flexibility and sound quality (or war of attrition on your wallet)	Optional inputs MC etc	R	50
Conrad Johnson MV50 £1699	Good+ Good+	Coupled with the PV5, this CJ power amp performed well on audition	50W		Collection
Conrad Johnson Motif MC-8 £1995	Very Good Very Good	A cheaper alternative to the '7, this preamp is an undoubted success in maintaining the Motif sound but does not compare on sound quality	MM/MC	R	50
Conrad-Johnson Premier Seven £8995	n/a Excellent	Price has increased since we tested it – but at this price who cares? The 'Seven is designed without compromise, and it's clearly one of the finest (valve) preamplifiers money can buy. Absolutely gorgeous!	MM, 4 line inputs, sep. Rec Out, versatile cartridge matching	R	72
Counterpoint SA12 £1250	Good+ Good+	A real power-house power amp, beefy and load-tolerant although like the SA7 a trifle untidy at frequency extremes	100W		Collection
Creek CAS 4040 S2 £179	Good Good	More neutral than its predecessor tonally, substantial improvements in transparency were also noted, while the lively punchy, character is retained	30W, MM, 4 inputs, tone controls	BB	62
Creek CAS 4140 S2 £219	Good+ Good	Redesigned for '88, this is a fine allrounder with good moving coil input, plain presentation	40W MM/MC 3 line inputs	BB	62
Creek CAS-5050 £399	Average Good	Strong RF IMD compromises the sound of the CD input which contrasts with the delightful performance via MM/MC	72W, MM/MC, aux CD and video + pre/power mode	R	74
Croft Micro £150	Average+ Good	A real upsetter, this excellent valve preamp put the cat among the pigeons proving good sounds can be made at budget price levels	4 inputs MM straight line	R	Collection
Croft Super Micro A £500	Average+ Very Good	The looks are somewhat improved, while this 'hot rod' version with tuned components performed very well indeed. There is still no gain on the line inputs	4 inputs, MM, straight line	R	57
Croft Series IV(S) £730	Good Good	The original IV is still available now supplemented by the higher price and power (S), both are fine performers	40(60)W channel	R	57
Croft Series IVSA £1000	Good Very Good	Featuring tuned components chosen for their sound quality, the 'A' variant is an impressive example of Croft's technique in valve design	60W special supply regulation	R	57
Deftec DSP-50S DPA-50S Pre/Power £675/£825	Excellent Very Good+	Remarkable pre/power combo based around the highly linear DH-0A32 hybrid op-amp. Unmatched detail resolution, control and transparency	63W, external feedback wiring, 3 line, MM/MC no tone controls	R	68
Deftec DPA 100S £2200	Very Good Very Good	A top-quality transistor power amp, sounding fast, articulate and well controlled, though maybe a touch clinical for some tastes	80W	R	50
Denon DAP-2500 POA-4400A Pre/Power £549/£599 pr.	Very Good Good	Denon's fully-fledged preamp also incorporates D/A converters that did not improve the sound of our £299 CD player. The power amps are brilliant!	172W, monoblocks Opt/Coax dig + 2 tape, 4 line and MM/MC inputs		68
Denon POA-6600 £1,000/pair	Excellent Very Good	Delivers abundant high quality sound, solid engineering expertise and content clearly compensating for any compromising of purist audiophile principles	250W monoblok, remote power	R	60
DNM 3A From £1000	Good+ Very Good	The DNM3 in its acrylic case is a remarkably revealing and neutral state of the art preamp	5 inputs MM/MC twin vol controls	R*	44
E.A.R. 802/509mkII £920/£1550	Average Very Good	Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100W, MM, 6 inputs, monoblocks	R	63

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NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>E.A.R. 549</b> £3,000/pair	Very Good Very Good	A valve monoblok that measures like a solid state amp is itself an achievement, but exceptional power delivery and bass 'slam' is not fully matched by delicacy and transparency elsewhere	200W monoblok, bias setting		60
<b>Exposure VII/VIII</b> £360/£340	Very Good Good	Supplied as a combination without the separate preamp power supply, this pre power combination performed satisfactorily especially on the moving coil input	50W, MM/MC, 3 inputs, straight line		62
<b>Exposure VI/VII Dual/VIII</b> <b>Pre/Power</b> £449/£219/£379	Good Very Good	An established company like Exposure could do more to improve the 'look' of these amps which, nevertheless, sounded confident, dry and musical	63W, Super mod. 4 line and 2 disc inputs with full rec-out switching	R	68
<b>Grant G60AMS</b> £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 monoblocks 8ohms	R	57
<b>Grundig A-9000</b> £650	Good+ Average—	Very large integrated design culled from Marantz, however is far too expensive to be fully competitive	153W, MM/MC, full record out selection		74
<b>Hafler DH120 kit form</b> £325	n/a Fair	We didn't build one; see below	60W		44
<b>Hafler DH-110/XL-600</b> £360/£995	Very Good Very Good	Preamp is available in kit form. Both sound remarkably open, transparent and inherently 'musical'. XL-600 is tremendously powerful and very compatible	426W in stereo mode, 1.5kW in bridge, R 2mm, tone + processor loop		74
<b>Hafler DH120 assembled</b> £396	Very Good Fair	Sound quality results were decent enough, but this power amp won't set the world on fire at this price	60W		44
<b>Harman Kardon PM635i</b> £159	Good Good	An improved version of the classic PM635 amp which sounds typically dry and articulate. Price is frozen	49W, 4 line and MM inputs A/B speaker o/p	R	68
<b>Harman Kardon 640 Vxi</b> £225	Good+ + Good	Moderately priced but built to HK's high standards; good value and good load tolerance	50W MM, 5 line inputs tone controls		56
<b>Harman Kardon PM645Vxi</b> £300	Very Good Good	Fits in well with the Harman Kardon series, giving a competent all round performance at a fair price	75W, MM/MC, 5 inputs, hdph, tone controls		62
<b>Harman Kardon PM650Vxi</b> £369	Average+ Good	A tight and slightly over-damped sound lacks any essential warmth or richness. Reduced headroom on MC	71W, 6 line, MM/MC and true A/V inputs		68
<b>Harman Kardon 655 Vxi</b> £449	Very Good Good	Plenty of well built integrated amplifier for the money, with lots of power to drive almost anything, plus versatile inputs	100W MM/MC 6 line inputs tone controls		56
<b>Harman Kardon Citation 25/22</b> £599/£859	Good Average+	Not as outrageous as previous Citation amplifiers but neither as punchy nor exciting in the sonic stakes. A good all-rounder but lacks sparkle	138W, MM/MC full range of input and record out		74
<b>Harman Kardon PM665Vxi</b> £699	Good Good	A versatile and meaty amplifier with high current capability, but sound quality lags behind certain home grown alternatives	150W MM/MC tone controls (switchable)		60
<b>ITL MA-80</b> £169	Good Good	A promising start for this young company, the MA-80 gave a fine sound with CD but was less wonderful on the moving coil input	30W, MM/MC, 5 inputs	R	62
<b>Jadis JP30/JA30</b> £7,425	Fair Excellent	Two-box preamp plus monoblok power amps, classic valve design gives stereotype valve sound. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at frequency extremes, in lab, and re cartridge matching	30W 2-box pre-, monoblok power, MM-only, 4 line inputs	R	60
<b>Jeff Rowland Coherence One/Model 7</b> £3750/£4950 each	Very Good Very Good	The technical design of these amps is very elaborate but ensures they achieve an extraordinarily transparent and potent sound. However, the CD i/p is clearly superior to the disc inputs	448W monoblok MM/MC with variable loading options. Balanced topology	R	72
<b>JVC AX-222</b> £110	Good Fair	Not very impressive, JVC need to pull their socks up if their budget amplifiers are to score	35W, MM, 4 inputs, hdph, tone controls		62
<b>Kelvin Labs Absolute Zero/M30</b> £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
<b>Kenwood KA-550D</b> £120	Very Good Fair	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
<b>Kenwood KA-5010</b> £210	Good Good	Offers a slightly bass-light but very smooth, fresh and alive sound. Well built and sensibly equipped	101W, MM/MC, CD 3 tape, tuner, aux + direct	R	74
<b>Kenwood KA-7010</b> £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
<b>Klyne SK5a</b> £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
<b>Krell KSA-200</b> £5050	n/a Very Good	Value derives partly from excellence of sound, but equally from imperturbability, flexibility, consistency, build and after sales care	200W	R	72
<b>LFD</b> £2,995+	Very Good Excellent	Can set the subjective standards that others merely aspire to, but this outstanding if unconventional multi-box preamp needs careful matching to ancillary components (cartridge, power amp)	MC (with care), passive line extra	R	60
<b>Linn LK1/LK280 Pre/Power</b> £495/£645	Good Good—	A very modern, logic-controlled amp with distinctive and inoffensive sound quality. Its restrained sound could do with extra insight and zip.	84W, compact amp CMOS sw. for 2 tape, 2 line and MM/MC. XLR sockets.		68
<b>Marantz PM25</b> £129	Good Fair	Soft and sweet like the rest of the range, the PM25 is inoffensive and undemanding	35W, MM, 5 inputs, hdph, tone controls		62
<b>Marantz PM35</b> £149	Very Good Good	This new generation Marantz is a good allrounder, and shows that extra care is being taken over sound quality; well equipped and versatile	45W MM/MC 3 line inputs tone controls		56
<b>Marantz PM45</b> £200	Good+ Fair	Generally pleasant and polite with above average clarity; there was some softening in the bass, restricting dynamic output somewhat	40W MM/MC tone controls		50
<b>Marantz PM-65AV</b> £250	Average+ Fair	One of the few amps to actually sound worse via CD direct! Unbalanced character but packed with AV inputs	82W, MM only wide range of aux/video		74
<b>Marantz PM-75</b> £449	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
<b>Marantz PM94</b> £1,000	Very Good Good	At 23kg the PM94 is no lightweight in either physical or sonic respects. A very powerful and comprehensively equipped amplifier	140W MM/MC tone controls (switchable)		60
<b>Marantz PM-95</b> £1,900	Very Good Average+	Beautifully constructed, this amp was less convincing via its digital i/p than via line. Class A option best suited to sensitive speakers. Costly	151W with 30W available in Class A. Opt + coax inputs		74
<b>Meridian 201/205</b> £599/£425 each	Very Good Good+	A fine preamp with additional luxury option of full system remote, plus competent and attractive monoblok power amplifiers with generally good performance	100W MM/MC 6 line inputs remote capable straight line	R/—	62
<b>Mission Cyrus One</b> £180	Very Good Good	A red hot class winner, which caused the whole issue to be re-rated! It's even well built — however, the headphone socket will only take a 3.5mm jack	30W, MM/MC, 5 inputs, hdph, straight BB line		62
<b>Mission Cyrus PSX</b> £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
<b>Mission Cyrus Two</b> £300	Very Good Very Good	Also a top performer in its group with fine moving coil and compact disc sound. Again, only 3.5mm headphone socket	50W, MM/MC, 5 inputs, hdph, straight line	R	62

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## AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>Mordaunt Short MS-A5000</b> £350	Very Good Good	With a recognisable pedigree, Mordaunt Short engineers have made a good job of this one. A musical all rounder	50W, MM/MC, 6 inputs, hdph, tone controls	R	62
<b>Musical Fidelity A1</b> £269	Good Good + +	Fine-ranking in terms of overall sound quality for money, the excessive heat output could be hazardous to your vinyl if you're careless	20W MM/MC 4 inputs straight line	BB	56
<b>Musical Fidelity B200</b> £299	Very Good Good +	Running cooler than other MFs, the B200 delivered fine musical and dynamic sounds with plenty of power	80W MM/MC 4 line inputs straight line	BB	62
<b>Musical Fidelity 3A-X/MA100-X</b> £379/£1,499pr.	Average Very Good	Power amps get extremely hot as a result of Class A operation. Sounds exceptionally rich, lush and effortlessly musical. Lacks transparency	105W, MM/MC + 4 line inputs, passive line out bi-wire option	R	74
<b>Musical Fidelity Pre 3/P140</b> £379/£349	Very Good Very Good	Delivering true audiophile sound quality well ahead of their price, both components shine in their own right	70W MM/MC 4 line inputs straight line	R	56
<b>Musical Fidelity A100</b> £459	Good + Very Good	This is another one recommended for fine sound with which you could keep your Chinese carry-outs warm	50W MM/MC 5 inputs straight line	R	62
<b>Musical Fidelity P170</b> £599	Very Good Very Good	Acquitted itself well, later samples showing steadily increasing refinements	85W	R	50
<b>Musical Fidelity MA-50</b> £875 pair	Good Excellent	An audiophile bargain. One of the best sounding power amplifiers made	50W, monoblok	R	62
<b>Musical Fidelity MVT Mk 3</b> £1199	Very Good Very Good	The MVT preamp was "strong in its class", providing competition for £1500-plus amplifier systems, now rivalled by the MF3B	MM/MC 5 inputs	R	50
<b>Musical Fidelity P270</b> £1299	Very Good Very Good	If the hot-box aspect is not a deterrent, this is something of a bargain. A big amplifier scale of sound which is just a little rough-edged	135W	R	50
<b>Musical Fidelity MVX &amp; A370</b> £2300/£2299	n/a Excellent	In its latest guise, the A370 confirms its status alongside the MVX as amongst the best indigenous components for both sound and presentation	MVX - MM/MC/4 line/phase invert. A370 - 150W	R	72
<b>NAD 3020e</b> £130	Good Fair	A little light in balance and "weight" but superior to run-of-the-mill budget amplifiers	20W MM/MC 4 inputs	R	50
<b>NAD 3225PE</b> £150	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
<b>Naim NAIT 2</b> £322	Average + Fair	Well built with good load tolerance the NAIT delivered a fully competitive sound in spite of its modest measured power output. Recent modifications as yet unchecked	15W pc MM 3 inputs	R*	50
<b>Naim Separates</b> £560-c£8,000	Very Good Good	A consistent and coherent series of 'building blocks' for conventional passive or active operation. Sound quality ignores conventional audiophile standards of presentation, but achieves fine musical communication	40-70W, MM/MC etc	R*	60
<b>Nakamichi CA-5E</b> £750	Very Good Good	A fine lab performance and high build quality but rather disappointing sound quality for a preamp of this price	MM/MC, 6 inputs, hdph, tone controls		62
<b>Nakamichi PA-5E</b> £1150	Very Good Good	A strong sound in several respects but one which ultimately failed to satisfy	100W		62
<b>Nakamichi CA7E/PA7E</b> £2500/£1700	Very good Good/Good +	Exceptional build and finish, plus good general performance, remote control and versatility, but expensive	200W MM/MC 6 line inputs, remote, tone controls		56
<b>Nuance</b> £795	Very Good Good	A subtle civilised pre-amp though a little lacking in resolution and detail; suited to some tastes but not top-drawer	4 inputs MC		50
<b>Oakley Image</b> £425	Poor Very Good	An interesting valve preamp from Yugoslavia, the Image on first impression needs a bit of tweaking to warrant <i>Choice</i> commendation but is a nice product nonetheless	MM, 5 inputs straight line		63
<b>Orell SA-040</b> £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
<b>Philips FA-880</b> £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
<b>Philips FA960 MkII</b> £299	Good + Average	The MkII '960 still failed to grasp our listeners' attention but it remains a competent amp nonetheless	122W, 6 line & 2 disc inputs + tone controls		68
<b>Philips DFA-888</b> £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
<b>Pink Triangle PIP</b> £2670	Excellent Excellent	This state-of-the-art preamp is one of the few truly high end products to come out of this country this year. It will most certainly worry the competition	MM/MC, 4 inputs, battery supply	R	62
<b>Proton 520</b> £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
<b>QED A240 CD II</b> £169	Good + Good	Latest 240CD is fine value for CD and has competent MM disc input as well	45W MM 5 line inputs straight line	BB	62
<b>QED A240 SA II</b> £219	Good + + Good +	Redesigned 240SA represents a significant allround improvement over its predecessor, and provides a good moving-coil disc input in a competitive price	45W MM/MC 5 line inputs straight line	BB	62
<b>QED A270</b> £329	Good - Good +	Building on the strengths of the '240, the '270 sounds weighty, fast and dynamic. A bit 'lumpy' via MC	51W, 5 line and 2 disc inputs, pre-out	R	68
<b>Quad 34</b> £285	Very Good Fair	This well-built durable preamp has useful filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4 inputs MM/MC tone controls		44
<b>Quad 405</b> £349	Very Good Fair	Not an impressive power amp but easy on the ear if not pushed and very reliable	100W		44
<b>Radford SC25</b> £862.50	Very Good Very Good	A very fair price for a solid, well built valve preamp, combining good allround performance and a neutral sound	5 inputs, MM, straight line	R	57
<b>Radford MA75</b> £977.50	Good Very Good	A fine quality valve monoblok with good load tolerance and a neutral accurate sound, offering significant gains in power and focus over the STA25	75W monobloks	R	57
<b>Radford STA25 Renaissance</b> £1115.50	Good Good +	Offering superb midrange performance if not quite as good at the extremes, the Renaissance valve power amp is a genuine audiophile product	25W	R	50
<b>Revox B150</b> £875	Very Good Average +	Beautifully constructed but hampered by Revox's convoluted logic control. Open and smooth sound. Still costly.	117W, CMOS sw. for 3 line, 2 tape and MM		68
<b>Revox B250</b> £1188	Very Good Good	With much improved sound over its predecessors plus amazing remote control facilities, this could form the heart of a round-the-dream-house system	150W MM/MC system/house remote tone controls		56
<b>Rose RV-23</b> £370	Average Very Good	A very attractive little British valve preamp with a sound that was rich, colourful and reasonably sharp via the CD input but was less impressive on disc	MM, 4 inputs, straight line		63
<b>Rotel RA810A</b> £100	Very Good Fair	As a cut price RA820AII this is a very successful little amp that loses little in sound quality to its predecessor. Excellent value	20W, MM, 5 inputs, hdph, tone controls	BB	62
<b>Rotel RA820A</b> £130	Good + + Good	This A version of an established budget favourite delivers the goods sonically and is fine value for money	35W MM 4 line inputs tone controls	BB	56
<b>Rotel RB/RC850</b> £150/£125	Good + + Good +	Quality separate pre and power amplifiers at near budget integrated amplifier prices. A notable achievement	60W MM/MC 4 line inputs tone controls	BB	62

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# THE DIRECTORY

## AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Rotel RA820BX3 £170	Very Good Good	The latest upgrade is not that impressive, but the BX remains a fine amplifier and now has a moving coil disc input	30W, MM/MC, 5 inputs, hdph, straight line	BB	62
Rotel RC-870BX/RB-870BX Pre/Power £199/£210	Excellent Good+	Reduced price makes the 870 combo better value but, despite mods to the preamp, it is the power amp that must take the lion's share of credit	128W or 208W in bridged mode. CD direct, 4 line, 2 tape and MM/MC	R	68
Rotel RA840BX3 £220	Very Good Good+	Requires a very long warm-up period but rewards with a refined sound that should suit 'lively' systems	59W, 2 tape, 2 line, MM/MC and A/V inputs	R	68
Rotel RA870BX £300	Very Good Good+	A powerful blockbuster with solid and well focused sound, good versatility and fine load tolerance	85W MM/MC 7 line inputs tone controls	R	56
SAE P102/A202 £499/£599	Average+ Average+	Microprocessor-controlled pre and power amp that sounds much better at low rather than high volume levels. Pro-oriented aesthetics	151W, MM/MC + CD tuner and 2 tape tone memory, spk switching		74
Sony TA-F200 £130	Average— Average	Over-ambitious protection circuit is hardly in keeping with modern amp design. Lean but 'dead' sound quality.	74W, 2 tape, 3 line and MM/MC inputs		68
Sony TA-F400 £200	Good Average+	Some lack of integration across the frequency range but still offers a more open and detailed sound than the 'F200	76W, 2 tape, 3 line and MM/MC inputs. Rec-out		68
Sony TA-F530ES £300	Good Average+	Chunky UK-oriented design that offers a rich, smooth and full sound. Slight loss of focus via MM/MC disc	120W, MM/MC, 4 line sources + record out + tone	R	74
Sony TAF 500ES £349	Good+ Fair	Not too hot at the price, lacking in bass action, rating poorly on vinyl, and only marginally improving on CD	75W hdph tone controls MM/MC		50
Sony TA-F630ESD £350	Good Average	Based on the '530 but equipped with PDM D/A convertor. Amp is competent but DAC sounds truly magnificent!	130W, as above + opt. and coax digital inputs	R	74
Sony TAF 700ES £500	Good+ + Fair	Scoring higher than the 500 but still not offering the sort of standards set by the competition. But many buttons to push	100W MM/MC tone controls		50
Sumo Nine+ £1200	Very Good Excellent	Macho styling of this class A stereo power amp conceals a sonic subtlety that is exceptional for the price, limited by lots of waste heat and a noisy fan on our sample (being improved)	65W	R	60
Sumo Andromeda £1585	Very Good Very Good	Well made with lots of power from a sensibly sized box. It was good in the lab and demonstrated a sound which offers a fine blend of performance at an almost reasonable price	200W, balanced input	R	72
Tannoy SR-840 £1713	Very Good Good	A "muscle" power amp, capable of impressive levels into difficult loads while remaining quite subtle and revealing	250W		50
Technics SU-V660 £250	Good Fair	Chunky build-but integrated output stage infers a weak, insubstantial and rather monophonic sound	107W, MM/MC, CD aux, tape + tuner + power amp-direct		74
Technics SE-M100 £550	Very Good Good+	An unusual disc-less poweramp with volume control. Standard line input sounds very open and clean. Digital input is harsher and less convincing	123W, coax and opt digital inputs, var and direct CD no MM or MC disc	R	74
Vacuum State FVP £999	Good Very Good	This well thought out valve preamplifier is designed for optimum musicality and transparency, a goal which is handsomely achieved	5 inputs, MM, straight line	R	57
Yamaha AX-300 £100	Good Fair	A lively and dynamic performer, offering a credible if bright sound at a competitive price	30W hdph tone controls (MM)		50
YBA Model 3 Pre/Power £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. Separate L/R volume controls		72
YBA 2 pre & pwr £1395/£1695	Good+ + V Good/Excellent	Superbly finished French audiophile separates, with very good space and transparency, slightly softened bass. Needs extra transformer (£300) for MC cartridges	70W MM (MC extra) straight line	R	56
YBA 1 preamp £2895	Very Good Excellent	A front line French audiophile product. Great stereo and a fine Krell style finish	MM/MC, 3 inputs, straight line	R	62
YBA 1 power amp £2995	Good Excellent	This equally well finished power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85W	R	62

\* rating refers to original, tested model

## LOUDSPEAKERS

Last item in the hi-fi chain, to some extent the loudspeaker is merely the slave of what has gone before, capable only of reproducing a signal as good as it is fed. Nevertheless the distortions (colorations and stereo effects) introduced by loudspeakers (and rooms) tend to be more immediately obvious than those anywhere else in the chain, so careful choosing according to taste is very important.

The average loudspeaker consists of a smallish enclosure, much of which may have begun life as

part of a tree, plus a couple of drive units hidden behind a removable grille. Inside the box lurks a simple electrical circuit known as a crossover, which divides the incoming (full range) signal into the right bits for the drivers to handle. Variations on the above formula are specifically identified in the entries. The designer's primary task is to balance the sensitivity of the loudspeaker (how loud it goes for a given electrical input) against the bass extension (how low does it go) for the given box size. After that such subtleties as coloration and

dispersion come into the equation.

Careful placement of the loudspeakers within the room is as important as the initial choice of model. For good stereo they need to be more or less the same distance from nearby walls, and preferably on similar rigid stands. The listener should be about the same distance from and listening angle to each loudspeaker. The ideal placement depends on the way a particular model has been balanced (not to mention a number of other factors), and our recommendation is given in the entries.

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Acoustic Energy AE1 £696	Good Very Good	To the author's knowledge, the most awesomely dynamic and articulate miniature ever made	29.5 x 18 x 25cm semi-open space	88dB/W 60Hz	R	59
Acoustic Energy AE2 £1138	Good Very Good	Dynamic, solid and lively, a great allrounder if a bit small considering the price. AE proves that metal cone/dome drivers really work.	39 x 23.5 x 29.5cm heavy stands in free space	88.5dB/W 45Hz	R	66
Acoustic Energy AE4 £1880 (stands £550)	Good Good	Magnificent but also seriously flawed, the AE4 possesses tremendous dynamic realism but a very mid-dominant balance. Large rooms and wallets only need apply.	54 x 32.5 x 44cm own stands in free space	90dB/W 40Hz		71
Acoustic Research Red Box £100	Average Average	Lively and balanced if a bit crude and uneven, this under-£100 econobox succeeds partly because of its simplicity, and works well with some rear wall assistance.	32 x 19.5 x 17cm close to rear wall	87dB/W 85Hz	R	74
Acoustic Research AR112 £125	Average Average—	Nicely presented and engineered, but sounds a bit small and boxy without true coherence.	36 x 19 x 18.5cm stands near rear wall	87dB/W 75Hz		66
Acoustic Research AR122 £150	Average Average	Despite a promising enough list of ingredients, the 122 failed to excite real enthusiasm amongst the listening panel	38.5 x 19 x 22cm stands near rear wall	87dB/W 68Hz		68
Acoustic Research AR132 £200	Average+ Average—	Good presentation and detail engineering was not sufficient to counter bass heavy balance problems on auditioning	44.5 x 23 x 25.5cm stands 1ft from rear wall	87dB/W 50Hz		66
Allison C06 £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 Orpheus £990	Good Good+	Large hi-tech two-way features unusual, sweet-sounding isodynamic tweeter; well engineered and balanced if a shade odd in appearance	65.5 x 28 x 34cm stands near rear wall	87dB/W 43Hz	R	71

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MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Apogee Scintilla £4990	Good Very Good	These take-me-to-your-leader speakers gave exceptional transparency and can achieve excellent results in a true audiophile system	145 x 88 x 9cm free space on floor	79dB/W 20Hz	R	46
Arcam Three £150	Average+ Average-	Arcam's baby speaker did not delight our listeners, but it might do better in less expensive systems	34 x 18 x 23cm close to wall at head height	88.5dB/W 95Hz		53
Arcam Two £280	Good Average	Most things to most men this compact is unlikely to disappoint with its lively "balsy" character though lacking weight... a bit	38 x 23 x 28cm near wall shelf or 40cm stands	88dB/W 55Hz		59
Arcam One Plus £380	Good Average	Provides a solid, weighty and rich sound, but is a little raw in the treble and indefinite in the midband	22.3 x 28.1 x 37.8cm open space, on stands	88.5dB/W 60Hz		59
Audio Electronics TC10 II £599	Good- Good+	Oddball appearance is rescued by a respectable technical performance, interesting and impressive engineering and fine sound quality at a realistic price.	70 x 33.5 x 33.5cm low stands in free space	87.5dB/W 40Hz	R	68
Avance 120 £279	Average+ Average+	This unusual "after eighties" looking speaker has the recipe for success, but not quite the right seasoning	42 x 30 x 30cm 30cm from wall on 40cm stands	86.5dB/W 60Hz		53
B&W DM550 £149	Good+ Average-	Beautifully presented, well engineered near-miniature with precise sound but a distinct lack of 'wellie'. Ideal for considerate flat dwellers	35 x 20.5 x 22.5cm stands in free space	86dB/W 70Hz		71
B&W DM560 £200	Average+ Average-	Fine cosmetic presentation and good engineering for the price; overload protection may be handy but listening panel was underwhelmed	49 x 23.5 x 30cm stands in free space	88dB/W 55Hz		66
B&W LM1 Mk II £249	Average+ Average	Probably one of the best 'micros' ever made, worth considering for special applications (boats or vehicles). Upgraded since our review	24 x 15.5 x 20cm shelf or flush mount	86.5dB/W 80Hz		31*
B&W CM1 £345	Good Average	Cleverly thought out luxury design package is also fundamentally well engineered, if a shade pricey on 'sound for pound' basis	24.5 x 16 x 22cm close to rear wall	84dB/W 90Hz		74
B&W DM1600 £369	Good Good	Crisp, dynamic loudspeaker with tight but not especially deep bass and a tweeter that sometimes sounds overcooked	49 x 23.6 x 30cm free space, open stands	87.5dB/W 60Hz	R	59
BLQ Q2 £275	Average- Average	Nearly a good loudspeaker, the basic balance is good, but the midband is very uneven and there are severe losses of resolution, 'space' and dynamics	43 x 25.1 x 24.5 semi open on stands	87.5dB/W 70Hz		59
Bose Interaudio 3000XL £140	Average Average-	Lots of perceived value and well enough balanced, but low cost cabinet and driver engineering results in a crude and unsubtle sound	46.5 x 29 x 23cm stands in free space	89dB/W 45Hz		71
Boston A4011 £120	Average Average-	Competent performance for size and price but below average relative to the UK competition	34 x 21 x 20cm on stands near wall	88.5dB/W 63Hz		41
Canton Plus S £140	Average Poor	Bright treble and virtual absence of any bass at all is too high a price to pay for an almost invisible loudspeaker	20 x 12 x 12cm against rear wall	87dB/W 130Hz		74
Canton Karat 20 £300	Good+ Average+	Very prettily finished and accomplished near-miniature, the bright-sounding '20's only difficulty lies in justifying its high price	34 x 22 x 20cm stands in free space	87dB/W 55Hz	R	71
Canton Karat 40 £550	Average Average	Pretty and compact three-way for those who mourn the passing of the loudness control - definitely errs on the boom'n'tizz side	50 x 27 x 27cm stands in free space	88dB/W 50Hz		71
Canton 60 Karat £630	Average+ Good	Looks a bit of a throwback designwise, but is nicely presented and has a lively, dynamic and generous sound	58 x 31.5 x 31cm stands in open space	90dB/W 48Hz	R	66
Castle Clyde £149	Average+ Average	A tidy little performer packing punch, but beginning to show its age in the light of new competition	37 x 21.5 x 22cm open space on stands	89.5dB/W 64Hz	R	46
Castle Durham £199	Average+ Average	Listening results were encouraging, well engineered and finished, but lean on treble and a bit weak on bass; still recommended	41 x 21.5 x 25cm near rear wall	89dB/W 67Hz	R	46
Castle Pembroke £309	Good Average+	Comfortably recommended, a sweet smooth sound with good overall balance of engineering-based performance	55 x 37.5 x 30.5cm open space on stands	88dB/W 46Hz	R	31
Castle Warwick £169	Good Average-	Excellent presentation and fine engineering with overload protection, but a sonic disappointment in bass and dynamic qualities	46.5 x 25 x 23cm stands 1ft from rear wall	88dB/W 50Hz		66
Celef Cirrus £180	Average Good	It's nice to see Celef back in the UK, with this decent sounding small reflex box that seems unusually tolerant of siting	39 x 20.5 x 23cm stands in free space	84dB/W 60Hz	R	66
Celef CF2 Nimbus £230	Good- Good-	Nicely balanced overall but a little uneven with it, this lively and dynamic large bookshelf model came close to Recommendation	46 x 25.2 x 24cm stands in free space	88dB/W 55Hz		71
Celestion DL6 Series Two £159	Good Average	Good tonal colouring and plenty of bass for the enclosure size; the metal dome tweeter is excellent, but bass and mid lack clarity and 'bite'	45.4 x 24.5 x 26.2cm near wall, on stands	87dB/W 65Hz		59
Celestion DL8 Series Two £199	Very Good Good	A refined middle market speaker has a smooth but slightly dull quality, with good definition and deep, if slightly boxy bass	50 x 27.5 x 27.8cm open, stands	87.5dB/W 60Hz	R	59
Celestion SL12Si £579	Average Average	Careful setting up does reveal elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling	53 x 20 x 27cm matching stands clear of walls	85dB/W 50Hz		66
Celestion SL600Si £799	Good+ Good	This Aerolam high tech miniature has certain remarkable qualities that some will find irresistible, and which go a long way towards justifying the highish price. Needs careful system and room matching.	27 x 20 x 23cm matching stands in free space	82dB/W 52Hz		68
Celestion SL700 £1349 inc stands	Good Good	Very sophisticated, mostly smooth and accurate transducer, with fast but not very deep bass and a rather bright treble	37.5 x 20 x 23.5cm free air on tall stands	83dB/W 45Hz		60
Celestion 6000 £1470	Very Good Very Good	A genuine fullrange audiophile quality speaker system - with Star Wars styling to suit a high tech environment	Complex, on floor in free space	82.5dB/W	R	60
Chameleon 500 £349	Average- Average-	Sounding badly coloured, dull and compressed, it is also amateurishly constructed, despite using good quality materials	38 x 25.3 x 31.3cm free, stands	89.5dB/W 75Hz		59
Duntech PCL500 Marquis £3998	n/a Very Good	Better value for money than the Crown Prince - and arguably more dynamic, with real bass 'slam' - but a little less refined in the higher registers	147.5 x 27 x 40 free standing away from walls	92dB/W 48Hz	R	65
Duntech PCL1000 Crown Prince £6120	n/a Very Good+	Immensely 'listenable', refined sounding speaker capable of creating 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
Energy 22 Pro Monitor £600	Good Good	Presentation is a bit rough for the price, but this Canadian entrant is an impressive sonic allrounder that will appeal to most listeners	62.5 x 27 x 30cm stands in free space	87dB/W 40Hz	R	66
Gale 301 £300	Average Average+	Of unusual, distinctive appearance this produced a mixed response, being lively but lacking depth	44 x 23.5 x 22cm on stands quite near wall	86.5dB/W 63Hz	*	46
Gale GS402 £700	Average+ Average+	Clean but rich and powerful bass; stereo focus was not a strong point, but it is worth considering. (Recent revisions not yet checked)	61 x 35.5 x 28cm on matching stands near wall	88dB/W 48Hz	*	46
Goodmans Maxim Two £90	Average+ Average	More wham-bam-thankyou-mam sound that imitates much bigger speakers when you let these babies yell. (A well-controlled yell)	26 x 17 x 19cm near wall on shelf or stand	86dB/W 85Hz	BB	59
Goodmans Point 3 £100	Average+ Average-	Recommended as good value for money, but our listeners' differing opinions mean your ears should judge for themselves	47 x 25 x 20cm shelf/high stand near wall	90dB/W 80Hz	R	53
Goodmans Sterling Point 5s £130	Good- Average-	Looks a remarkably good deal with apparently good engineering, but the room drive is mid-dominant and the sound is loud but not that likeable.	56 x 29 x 26cm stands in free space	89dB/W		71
Goodmans Point 7 £180	Average+ Average	Basically competent performance-mix and a lot of speaker for the money, but a certain lack of refinement nonetheless	69 x 33 x 26cm free space on 35cm stand	89dB/W 47Hz		53

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MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Harbeth LS3/5A £330	Good Average	Still a classic miniature, though not to every taste, and none the better for the recent update under our listening conditions. Limited dynamic range	30.5 x 19 x 16cm stands in free space	81dB/W 60Hz		66
Harbeth HL Compact From £499	Very Good Average	The clean and neutral sound lacks resolution and gives rather unobtrusive though well differentiated stereo. Can be bi-wired to advantage	52 x 27.2 x 28.1cm open space, on high stands	87.5dB/W 65Hz		59
Heco Interior 90S £129	Good Average—	Neatly finished and engineered miniature, but the disappointingly 'lifeless' sound left the listening panel decidedly underwhelmed	27 x 18 x 16cm on high stands	87.5dB/W 90Hz		74
Heco Interior 430s £399	Good Good—	This tall floorstanding enclosure delivers an impressively even sound balance with good bass extension, if not the lively dynamics to satisfy enthusiasts	85 x 24 x 27.5cm free space	88dB/W 43Hz	R	71
Heybrook Point 7 £185	Average Average	Physically an attractive package, but not entirely convincing in lab or listening panel test; interesting for all that	40.5 x 23 x 23cm stands against rear wall	85dB/W 60Hz		68
Heybrook HB1 £199	Good Average+	No longer an over-bright character, a strikingly clear sound and fine transient performance now merits recommendation	47 x 29 x 23cm on stands near wall	88dB/W 61Hz	R	46
Heybrook HB100 £255	Average+ Good	Well matched for wall 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 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 57Hz		66
Infinity Kappa 6 £795	Good Good	Interestingly styled US loudspeaker has unusual high tech drivers and good neutrality, but the sound seriously lacks excitement	63 x 38 x 24cm stands, free space	85dB/W 35Hz		66
Infinity Kappa 8 £1795	n/a Good++	Very nicely made and unobtrusive but large four-way speakers which have a tendency to sound bass heavy unless used with solid core cables	118 x 51.5 x 17.5cm floor standing, open space	89dB/W 33Hz		72
Jamo Concert 2 £230	Good Average—	A thoroughly respectable 'bookshelf' performer that needs free space siting but includes attractive cabinetwork and a neat grille	41 x 24 x 25cm stands in free space	85dB/W 48Hz		66
JBL TLX12 £149	Good— Average	This smart near-miniature has a 'boppy', lively bottom end, but beware of the fizz in its top	37 x 23 x 23cm stands 0.5m from rear wall	87dB/W 55Hz	R	71
JBL LX44 £340	Good— Average	This generously built model offers good power handling, bass extension and dynamic range, but suffers from the 'three-way syndrome', with middle muddle	58.5 x 30 x 29cm stands in free space	89dB/W 40Hz		71
JPW Sonata £99	Good Average+	Well balanced and integrated, this near-miniature offers fine sound if limited bass and dynamic range, plus real tree wood at a nearly silly price	32 x 23 x 20cm stands near rear wall	86dB/W 55Hz	BB	71
JPW P1 £139	Good Average+	Honest and basically articulate if not very sophisticated, resolution is good but it can sound a little wearing in bright systems or with rough sounding material	44 x 25.9 x 26.1cm free space on stands	89dB/W 60Hz	R	59
JPW AP2 £165	Good Good	Few grounds for criticism but purchasers should check out the treble qualities to avoid hammering the ear anvils	46 x 26 x 25cm 40cm from wall on 45cm stands	89dB/W 65Hz	R	53
JPW AP3 £219	Good Average+	Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52 x 25 x 29.5cm near wall on stands	90dB/W 57Hz	R	46
KEF C15 £99	Good Average	One of the tiniest around delivers a surprisingly 'big' and well balanced sound, with excellent stereo from free space siting	26.5 x 18 x 14cm stands in free space	85dB/W 60Hz	R	71
KEF C75 £349	Good Good	Compact floorstanding model's Uni-Q driver provides fine crossover integration, giving stable stereo and fine dynamic range within a slightly 'rich' balance	72 x 24.5 x 25.5cm floor in free space	90dB/W 45Hz	R	71
KEF R102 £365	Very Good Very Good	High class near-miniature with expressive, articulate midband and clean, accurate bass and top. The sound quality of the Kube circuitry, however, is suspect; what would an audiophile Kube sound like?	33 x 20.7 x 26.3cm near wall or open on stands	89.5dB/W 60Hz	R	59
KEF 103/3 £680	Good+ Good	Technically impressive, excellent bass/power handling for size, but not for the audiophile system. Better among cheaper components, and good in a large room	56 x 27 x 30cm supplied stands free space	90-95dB/W 35Hz		53
KEF 104/2 (inc KUBE equaliser) £895 (£994)	Very Good Good++	A reference point for dynamics, preferred without KUBE, suited to many rooms. Good stereo, high sound levels	90 x 28 x 41.5cm floor standing in free space	92dB/W 50Hz	R	60
KEF 107 £2025	Very Good Good+	A welcome sense of ease and lack of strain at most normal levels. Minor criticisms included a dulling in the extreme treble. Excellent bass extension	116.5 x 33 x 45cm on floor in free space	87.5dB/W 20Hz	R	60
Linn Helix £279	Average+ Good	Attractive presentation is coupled with an attractively lively sound which is more neutral if less committed than earlier Linn loudspeakers	51 x 25.5 x 28cm stands 1ft from rear wall	88dB/W 53Hz	R	66
Linn Nexus £379	Good Average	Good features include a solid, meaty bass plus good imagery and tonal balance. The catch is that Nexus lacks resolution and timing	49 x 23.5 x 30.4cm near rear wall supplied stands	89dB/W 60Hz		59
Magneplanar SMGa £675	Average— Average	Tonally 'rich', in the right room it proved a satisfactory musical experience	122 x 48 x 4.5cm on floor clear of wall	85dB/W 56Hz		46
Magneplanar MG1.4 £1190	Good+ Good+	Replaces the stalwart MG1c with a revised panel layout. Offers a very crisp and articulate sound, particularly revealing of upper mid vocal details	155 x 8 x 57cm open space	88dB 40Hz	R	72

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## THE DIRECTORY

## LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
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 MG111a £2700	Good Very Good	Another excellent true-audiophile loudspeaker this American panel speaker helps to convey much of the original character of the music	180 x 62 x 38cm well clear of walls	84-86dB/W 35Hz	R	46
Marantz LD20 DMS £150	Average Average	Recommended more for CD users than vinyl keepers, soundly engineered and built but should be heard before bought	36 x 23 x 24cm free space on 45cm stands	86.5dB/W 55Hz		53
Marantz LD50DMS £200	Very Good Good—	Well behaved larger two-way has fine balance, stereo and integration with good bass extension, albeit with mild 'boxy', 'chesty' and 'fizzy' effects	42.5 x 27 x 28cm stands in free space	87dB/W 50Hz	BB	71
Martin Logan CLS II £3998	n/a Very Good	Much improved high resolution design, fussy about system set-up and demanding of ancillaries and software alike. It rewards the efforts though	60 x 28 x 7.5cm open space	86dB/W 45Hz	R	72
MB Quart 220 £270	Average— Average	The elaborate and pretty enclosure in a wide range of finishes works better than the drivers and crossover, which impose a lumpy balance	30 x 22.5 x 21cm stands in free space	87.5dB/W 80Hz		74
MB Quart 390 £469	Below Average Poor	An aggressive, messy sounding design whose uncouthness undermines the positive level of detail	52 x 31 x 30.5cm open space, on stands	89.5dB/W 60Hz		59
Meridian M30 £775	Average+ Average	Pricy but easy on the ears and worth considering especially where space is at a premium	38.5 x 18 x 32cm free space on stands	Active 40Hz		46
Mission 761 £120	Average Good	One helluva speaker for the price, if a shade small and short of subtlety and refinement — should prove a worthy successor to the 70 and 700	38 x 21 x 21cm stands near rear wall	87dB/W 60Hz	BB	66
Mission 762 £180	Average Average—	Mission's 'bookshelf middleweight' offers high sensitivity and loudness capability, but at the expense of a somewhat untidy and rather 'heavy' sound	50 x 25 x 27cm stand, experiment advised	91dB/W 55Hz		66
Mission 763 £280	Average+ Average+	A very artful combination of generous volume and good bass extension at a modest price. Works well in the listening room despite a few rough edges	77 x 25 x 32cm near rear wall	86dB 40Hz	BB	68
Mission Cyrus 782 £340 (stands £80)	Good— Good—	Lively, articulate and beautifully finished, this compact wall-mount model with twin main drivers has good integration but a rather rich, 'loudness' balance	50 x 25 x 32.5cm Cyrus stands near wall	90dB/W 50Hz		71
Mission 764 £400	Good Good—	Large floorstander has fine bass extension but limited dynamic range, and sounds 'lazier' than Best Buy 763	86 x 25 x 32cm 0.5+m from rear wall	86dB/W 43Hz		71
Monitor Audio Monitor 7 £150	Average— Average	This lively and punchy near-miniature looks pretty enough and is good value but is let down by an unruly and indifferently integrated tweeter	34 x 16.5 x 17cm stands 1ft from wall	84dB/W 70Hz		74
Monitor Audio R300/MD £250	Average Average—	An attractive 'large bookshelf' model that's handicapped by poor crossover and integration between paper cone bass and metal dome tweeter	47.5 x 25 x 30.5cm stands in free space	88dB/W 50Hz		71
Monitor Audio R352/MD £299	Average+ Good	A good value large box that sounds more engaging than subtle, providing a good compromise between bandwidth and sensitivity	64 x 25 x 32cm stands in free space	89dB/W 45Hz	R	66
Monitor Audio R852/Gold MD £449	Good Good	Luxury build and 'high tech' tweeter or not, this compact model offers good refinement and detail on an open soundstage	45 x 25 x 26cm stands in free space	86dB/W 50Hz	R	66
Monitor Audio 1200 Gold MD £799	Average Average+	This smooth and civilised slimline floorstanding loudspeaker is well built and nicely presented. But it is also expensive	94 x 20 x 26cm in free space	85dB/W 48Hz		68
Mordaunt Short MS10 II £90	Average Average—	One of the best miniatures around. A borderline Best Buy because of the bass limitations, which may depend on your taste	29 x 20 x 17cm wall bracket	86dB/W 75Hz	R	53
Mordaunt Short MS100 £189	Average+ Average+	A 'mid forward' tonal balance is its main drawback but other aspects such as ambience, transparency and stereo depth compensate	32.5 x 22.5 x 21.5cm stands near wall	85dB/W 80Hz	R	46
Mordaunt Short 45Ti £230	Good Average	A sensitive tandem-bass number that can be driven loud but loses its balance a bit and can be unsubtle	63 x 26 x 30cm low (20cm) stand near wall	90.5dB/W 52Hz		53
Mordaunt Short MS300 £319	Average+ Average+	Not considered particularly competitive in its class, though it has good power handling and stereo focus	54 x 22.5 x 25cm on stands near wall	89dB/W 65Hz		46
Mordaunt Short 442 £1150	Good+ Good++	A resounding success with the listening panels. Make sure your room can accommodate the bass	95 x 26 x 38cm floor standing in free space	87.5dB/W 40Hz	R	60
Musical Fidelity Reference 2 £199	Good— Good—	This compact wall-mount design with advanced drivers has good dynamics, balance and stereo, plus flashy styling and some midband 'boxy' coloration	38 x 25 x 20cm stands near rear wall	88dB/W 50Hz		71
Musical Fidelity MC-2* £299	Very Good Good++	This exceptionally clean and clear design offers real subtlety and finesse. Bass quality is light but exceptionally clear; the treble is smooth if slightly shallow	48.5 x 25.5 x 16.5cm open space and stands	87.5dB/W 65Hz	BB	66
Musical Fidelity MC-4* £499	Very Good+ Good++	Achieving a very high standard, the MC-4 sounds detailed and coherent like the MC-2, but with more bass depth and solidity, and large image scale	56.5 x 26.9 x 29cm open space on stands	87.5dB/W 60Hz	R	59
NVA Cube 1 £600 (stands £200)	Good— Good+	Attractive, cube-shaped semi-omni is very sturdily built, and gives an idiosyncratic but unusually open, spacious and informative sound	33 x 32 x 32cm own stands c0.5m from wall	85dB/W 52Hz	R	71
Opus 3 Credo £399	Average Average	Credo's odd-shaped silicate-based cabinet confers good box and bass performance, but the sound could be more neutral for the price	32 x 28 x 32cm stands in free space	88dB/W 65Hz		74
Opus 3 Capella £599	Good Good	The sound of this Scandinavian curiosity certainly benefits from the crushed marble enclosure, though presentation is strictly DIY	32 x 40.5 x 26(ave)cm amongst books in bookcase	86.5dB/W 45Hz		66
Quad ESL-63 £1690	Good+ Good++	With its unusual but subtle characteristics this classic electrostatic may not be punchy in the bass, but has strengths that some cannot live without	92 x 66 x 27cm open stand well clear of wall	84dB/W 34Hz	R	60
Richard Allan CD5 £184	Average— Average—	This neatly presented small reflex design can sound engagingly communicative, but is flawed sonically and technically and quite expensive too	38 x 19 x 23cm on rigid stands	88dB/W 80Hz		68
Rogers LS7t £399	Good+ Good+	A fine combination of classic qualities at reasonable price produces the "R" tag, but try to get a pair home on approval to check for bass 'heaviness'	56 x 27 x 28cm free space on 40cm stands	88.5dB/W 48Hz	R	59
Rogers Studio 1a £579	Very Good Good—	The classic BBC monitor style sound sensitively updated — transparent and natural with fine stereo, but a touch 'heavy' in balance	63.5 x 30.5 x 30.5cm stands in free space	87dB/W 36Hz	R	66
Rotel RL850 II £130	Average+ Average+	Strongly recommended. Well-balanced, clear, with decent focus and fine stereo, but tendency to 'heaviness' needs decent stands and space	44 x 25 x 24cm free space on 40cm stands	86.5dB/W 50Hz	BB	59
Royd A7 Series 11 £99	Average+ Average	Lively clear sound; good upper bass and dynamics, but treble "ramp" made vocals sound shut in. Try before you buy	31 x 20 x 17cm shelf or 50cm stands near wall	86dB/W 75Hz	R	53
Royd Eden £235	Average Average+	Delightful mid/treble speed and transparency but determinedly bass light, this oddball miniature threatens cult status but could use a sweeter tweeter	31 x 20.5 x 18.5cm stands close to rear wall	87dB/W 85Hz	R	66
Ruark Swordsman £200	Good Average	Very attractively styled and finished, the Swordsman is a well built 'small bookshelf' model that delivered better test than listening results	38.5 x 20 x 27.5cm stands 0.5m from wall	84dB/W 50Hz		71
SD Acoustics OBS £695	Average Good+	Large but unusually pretty, needs a big(ish) room and has a sting at the top, but the transparent dipole midband provides an unusually open and dynamic sound	102 x 35 x 25cm spiked, in free space	86dB/W 45Hz	R	71
SD Acoustics SD1 £1150	Average Very Good	A large scale, airy and unusually detailed system with excellent dynamics. Balance is light and bright, and the original model could upset some systems/listeners. Current model has more civilised top-end and warmer overall balance	123.5 x 38.2 x 31.9cm free standing, away from walls	90dB/W 50Hz	R	60

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



# THE DIRECTORY

## LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Shan Shimma £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	Pricey, yes, but an extremely capable loudspeaker. Musical and transparent; excellent bass extension	112 x 38 x 33 free standing away from walls	90dB 35Hz	R	65
Sony APM-101ES £99	Good Average	Big hearted sound from small bookshelf successor to BB '10ES, sounds a little untidy at frequency extremes, so suits CD better than vinyl	39.5 x 22.5 x 23.5 stands in open space	86dB/W 52Hz	R	71
Sony APM-181ES £300	Very Good Average	Big and beefy but also somewhat fat and bass heavy, this well engineered three-way has notable strengths but lacks transparency and sounds better at lower levels	57.5 x 29 x 36cm stands in open space	87dB/W 40Hz		71
Sony APM 66ES £700	Average+ Average+	Powerful heavyweight sound with a brilliant midband – clear articulate and transparent. But the bass is on the boomy side and the treble can sound grainy	66 x 38 x 36.5cm open space, low stands	89dB/W 60Hz		59
Spendor SP2 £470	Very Good Good+	Conceding little to the SP1, this 30 litre model displayed good tonal balance with a highly articulate midrange, only slightly marred at frequency extremes	50 x 25 x 30cm free space, stands	87dB/W 45Hz	R*	59
Spendor SP1 £710	Very Good Good	A very subtle and musical performer that works particularly well with digital material. An exceptional allrounder	63.5 x 29.5 x 30.5cm stands in open space	87dB/W 41Hz	R	60
Spendor SA3 Passive £1500	— Good+	Same as Spendor SA3 active	85 x 38 x 46cm low	89dB/W 32Hz	R	46
Spendor SA3 Active £2900	Good+ Very Good	Substantial speakers designed to deliver high sound levels and killer bass. Suited to larger rooms and power hungry ears	85 x 38 x 46cm low rigid stands in free space	89dB/W 32Hz	R	46
Spica TC50 £599	Good— Good	This triangular-profile 'grown up' miniature is a shade boxy and laid back but has good rhythmic and musical integrity	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica TC50SE £799	Good— Good	A heavily UK-modified TC50, the SE sounds less boxy and more spacious, but lacks some of the urgency of the standard model	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica Angelus £1295	Good Average	A little bass shy and soft in the bass and lower mid, the Angelus is otherwise tidy, extremely lively and fluid, if uneven overall	116.8 x 53.3 x 26cm free standing away from walls	86.5dB/W 50Hz		60
Studio Power Sapphire £100	Poor Average—	Balance difficulties are improving, though still prevent the potential of this interesting metal-cone new miniature from being fully realised	30 x 20 x 19.5cm stands near rear wall	85dB/W 70Hz		66
Tannoy DC1000 £200	Average Average—	The smaller of two DC models with dual concentric drivers, the '1000 is much less well balanced than the larger, floorstanding '2000	50 x 24 x 25cm	91dB/W 53Hz		71
Tannoy DC2000 £300	Good Good	Remarkably high sensitivity from unique dual concentric driver that has an involving but characteristic sound. Bass could be better	68.5 x 26 x 27cm floor in free space	93dB/W 55Hz	R	66
Tannoy Westminster £3600	n/a Good+	These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge, flat against rear wall, away from corners	96dB/W (manuf.)	R	Coll
TDL Monitor £1600	Very Good Very Good	Fine solidity and good accuracy, with enough bass extension to satisfy even organ freaks. Needs a big room and can sound a bit lazy and a shade tinkly	118.5 x 30 x 47cm 0.5m from walls	85dB/W 28Hz	R	66
Technics SBC 250 £130	Average+ Average—	Despite a fairly even tonal balance, the 250EK sounded muddled in the midrange and dull in character	36.5 x 23.5 x 20.5cm free space, stands	86dB/W 60Hz		46
Technics SB-RX50 £500	Very Good Average+	With its unique coaxial drive unit the RX50 proved a smooth and well balanced loudspeaker, its minor weakness being a mildly excessive low bass	48 x 30 x 26cm free space on 40cm stands	86dB/W	R	46
Toshiba SS33-M £100	Average Average	Providing a benchmark for budget loudspeakers, this Toshiba-inspired but UK designed and manufactured model is a lot of loudspeaker for the money, if a shade on the cheap	40 x 26 x 21.5cm stands in free space	86dB/W 55Hz	BB	68
Townshend Glastonbury II £1700	n/a Very Good	What? No bass? Actually, like the KEF 107, Glastonbury II goes down so low you might not notice how good it is. A truly remarkable performer. Superb soundstaging too	91.5 x 28 x 46 free standing in room corners	88dB 27Hz	R	65
Videotone Minimax 2 £80	Poor Average—	Cheap in build and QC as well as price, but cheerful (if coarse) with it – if a little too cheerful after extended listening . . .	27.5 x 17 x 20cm near rear wall	84dB/W 90Hz	R	74
Visonik David 6000i £160	Average— Poor	Sharp styling a classy looking miniature makes, but the complex grillework worsens a sound which starts off with too much <b>tl</b> and not enough bottom	20 x 12 x 13cm against rear wall	87dB/W 130Hz		74
Wharfedale Delta 30 £80	Good Average	Very clear and surprisingly neutral for the price, with good dynamics and stereo within limited volume ceiling	37.9 x 20 x 16.9cm near wall on high stands	88.5dB/W 80Hz	BB	59
Wharfedale Delta 50 £100	Average+ Average—	"There's nothing obviously wrong, but it seems a bit mundane," is what we said when the Delta 50 was £129. But since then the price has dropped by 30 per cent, making it great value	48 x 27 x 19cm near wall on 40cm stands	88dB/W 55Hz		53
Wharfedale Diamond III £100	Below Average Average—	This latest version of the long running Diamond sports a better tweeter, but bass, though deep, is soft, and the midband is indistinct and uneven	24 x 18.5 x 20.5cm near wall, stands	86.5dB/W 75Hz		59
Wharfedale Super Diamond £140	Average Average—	Although there are improvements on the basic "legendary" model, listening panelists did not get airborne about this upgrade	24 x 19 x 19cm close to wall at head height	88dB/W 57Hz		53
Wharfedale 504/2 £150	Average Average	Not strictly accurate, this musically involving miniature sounds unusually coherent and well integrated, if a shade dull in balance	29 x 18.5 x 19cm stands against rear wall	84dB/W 60Hz	R	68
Wharfedale 505/2 £180	Average Good	This lively Wharfedale provides plenty of speaker with unusual refinement for the money, and should be fairly tolerant of room siting	44 x 25.5 x 24cm stands 1ft from wall	86dB/W 55Hz	BB	66
Yamaha NS 1000M £899	Good Good+	Living up to its monitor label, and tonally well suited to digital material, the NS 1000M is superbly crafted and capable of high levels	67.5 x 37.5 x 32.5cm 30cm from wall, stands	90dB/W 40Hz	R	46

\* rating refers to original, tested model.

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# THE DIRECTORY

## CASSETTE DECKS

The bad odour of copyright theft hangs around the compact cassette, but there is no doubt it is the world's most versatile and ubiquitous music storage medium. Hi-fi buffs may wrinkle their noses pointedly, but are still happy to use cassette decks to make up tapes for the car or personal – at the same time complaining loudly about the quality of pre-recorded material. (In fact the very best decks can do a surprisingly good job with musicassettes.)

There is no problem in connecting a cassette deck to any normal amplifier, but some care needs

to be taken in choosing the best tapes for a specific machine. (Trial and error is one effective technique, but many decks have manual bias adjustment and some match up to the tape automatically.) Lab performance and sound quality often go hand in hand, and are frequently somewhat dependent upon factory alignment. The mechanical integrity of the mechanism itself is another crucial factor, that is often reflected in the asking price.

All modern hi-fi decks have Dolby B and the majority have Dolby C besides; the very worthwhile

HX Pro system is becoming steadily more widespread. Remote control remains rare, though sometimes it is available as a system option. Three-head recorders allow simultaneous checking of the recording being made. Auto-reverse is a useful convenience feature, but usually with some mechanical compromise, while double-mechanism 'dubbing' decks of dubious quality are fashionable at the bottom end of the market. The welter of different 'music search' systems available is some indication of their frequent ineffectiveness.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research RD-06 £280	Average Average+	Acceptable middle market player with very simple facilities and cramped control section, but unusually good looks	Dolby B/C HX Pro, fine bias, counter memory, repeat		69
Aiwa AD-F270 £90	Average Average+	An excellent budget machine, adequately equipped and satisfactorily built. Sound quality is in severe danger of transcending the price category	Dolby B/C, fine bias adjust	BB	75
Aiwa AD-F370 £130	Average Average	Adequate but uninspiring recorder with detail shortcomings but good control layout and successful sounding with recorded musicassettes	Dolby B, C, HX Pro, bias adjust		63
Aiwa AD-R470 £150	Average Good	For once, an auto-reverse deck with the performance of a decent unidirectional one at a similar price. The Aiwa is modern in concept and execution, and has good, transparent electronics	Dolby B/C/HX Pro, auto reverse, cue & review, bias adjust	BB	69
Aiwa AD-WX777 £179	Very Good Very Good	Excellent, middle price dual deck with quick side change and a living, breathing sound – though prerecorded tapes sound bright	Twin auto-reverse, one records. Dolby B/C, fine bias	BB	75
Aiwa AD-F700 £199	Good Average—	Somewhat less than the sum of the (most fine) individual parts, this deck has an artificial quality which spoiled the efforts of a fine transport	Dolby B/C/HX Pro, fine bias, CD Direct input		75
Aiwa AD-F800 £249	Good Very Good	Close to first class performance – and superb value. The Aiwa is purposeful and finely engineered. It provides a near irresistible blend of good mechanics and electronics	3 head, dual capstan, Dolby B/C/HX Pro, tape calibration	BB	75
Aiwa AD-WX888 £249	Good Good	Inaccurate set-up spoils metal tape operation, but with other tapes the deck works well. This deck offers fine engineering, facilities and sound	Dual auto-reverse twin deck, Dolby B, C and HX Pro	R	75
Aiwa XK-007 Excelia £400	Good Good	Downmarket version of XK-009 with simplified bias/equalisation adjustment section and more forgiving but less informative sound. Still good, but less exciting than XK-009	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment		63
Aiwa AD-WX909 £400	Good Good	Convenience meets sound quality, and both win. An essentially clean, positive recorder which works alongside an auto-reverse player of lower standard – a sensible compromise	Dual deck, auto-reverse, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57
Aiwa XK-009 Excelia £550	Very Good Very Good	Excellent detail, stable articulate midband and slightly obvious treble. The most interesting Aiwa for yonks	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment, CD direct	R	63
Akai GX-32 £200	Average Poor	Constrained and smeared sum this deck well. It has poor bass and treble definition alike, though it proved well aligned for prerecorded cassettes	Dolby B/C, variable bias, headphone out, track search		69
Akai GX-52 £249	Very Good Very Good	Well finished and a pleasure to use this well specified deck sounds clean and defined with all tape groups, with or without Dolby	Dolby B, C, HX Pro, track locate features	BB	57
Akai GX-6 £350	Good Good	There is a strong sense that someone has really thought this one through; it has an indefinable 'specialness'	Real-time counter, track search, Dolby B, C, bias adjust	R	52
Akai GX-95 £400	Good Very Good	Well designed and finished cassette deck with features well judged to please the audiophile – especially switchable Dolby HX Pro and switchable panel display. The calibration system is simple and effective, and the deck sounds great	Dolby B/C/HX Pro, 3 head, manual tape set-up	R	69
Denon DR-M07 £125	Poor+ Average	There were several problems with the test player that render it an unsafe purchase. This is a pity since despite the antiquated control system, the deck is capable of refined sound quality	Dolby B/C, fine bias adjust		69
Denon DRM-500 £170	Good Very Good	Powerful, refined and detailed sound, and an excellent transport are keys to the success of this cleanly styled addition to the range – but why no timer standby?	Dolby B/C/HX Pro, variable bias	BB	75
Denon DR-M12HX £220	Good Good+	Well constructed and pleasant to use, a lack of true pitch constancy kept it from sounding superb	Track search, Dolby B, C, HX Pro, bias adjust	R	57
Denon DRW-750 £229	Good Good	Polished and articulate, the only significant shortcoming is poor performance with prerecorded material	Dolby B/C/HX Pro, twin unidirectional, one records	R	69
Denon DR-M24HX £290	Good Good+	This deck will slot into many high grade systems without disgracing itself – or the cassette medium. Very presentable high resolution sound with good stereo with or without Dolby	Dolby B, C, HX Pro, bias adjust, 3 Head	R	60
Denon DRM-800 £299	Good Very Good	There are some niggling faults and limitations (no timer standby is particularly annoying), but as a means of recording music it sets a very high standard	Dolby B/C/HX Pro, off tape monitoring, dual capstan	R	75
Denon DR-M34HR £320	Very Good Good+	Prerecorded cassettes sounded grey and dull, but this may have been a sample fault. As a recorder, the DR-M34 is refined and detailed – and good value	Dolby B, C, HX Pro, 3 Head, manual tape calibration, memory counter		63
Dual CC8010 £110	Average Average+	The only limitation worth noting is a slight opaqueness; the Dual otherwise sounds stable and effective. An excellent low-cost design	Dolby B & C, microphone input	BB	63
Goodmans GSW-5200 £90	Poor Poor	Musically unimpressive but at least it's cheap!	Dolby B, twin, one records		69
Grundig Fine Arts CCT-903 n/a (system component)	Good Good—	[Competent part of complete Grundig system]. Solid and well engineered deck with small but significant problems preventing it scoring highly. Basic design generally – and transport specifically – are excellent	Dolby B/C, twin auto reverse, one records		69
Harman Kardon CD491 £695	Good Good+	Excellent audio engineering and tremendous flexibility make this an audiophile cassette deck 'par excellence'	Real-time counter, auto reverse, track search, Dolby B, C, HX Pro, bias adjust	R	52
Kenwood KX-440HX £140	Average+ Poor	Uneven, unstable sounding player with limited resolving power, but good control layout and finish	Dolby B, C, HX Pro, intro scan		63
Kenwood KX-3010 £170	Average+ Average	Minor ergonomic shortcomings notwithstanding, this is a workmanlike deck that only misses recommendation due to an azimuth problem leading to very dull sound with prerecorded tapes.	Dolby B, C, HX Pro, auto bias		75
Kenwood KX-5010 £269	Very Good Excellent	This important new middle price deck is a well thought through and thoroughly developed design which eschews gimmicks for the sake of musical excellence	Dolby B/C/HX Pro, auto tape calibration, track/intro search	BB	69
Kenwood KX-9010 £400	Very Good Average+	Clean, detailed but flat and overtly hi-fi-ish sound quality makes the 9010 a little less than the sum of its parts.	3-head, auto tape calibration, Dolby B/C/HX Pro, remote control		75
Marantz SD-35 £150	Good Good+	Rock steady tape transport gives very competitive sound quality for the price, but the slightly bright replay may not appeal to some	Dolby B & C, bias adjust	R	52
Marantz SD-45II £200	Good+ Good+	Well built and dynamic sounding player, working better as a recorder than with musicassettes	Dolby B & C, bias adjust Auto selection	R	52
Marantz CP230 £300	Average Average	This is a competitively priced portable recorder though not suited to replay of musicassettes	Dolby B, bias adjust	R	52
Marantz SD-55 £349	Good Very Good	Slightly tacky feel and restricted signal/noise performance are the main shortcomings of an excellent sounding piece of kit	Real-time counter, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57

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

# THE DIRECTORY

## CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>Marantz SD585</b> £300	Average Average—	Sound quality is a little sat upon, and control ergonomics are somewhat opaque, though the twin auto-reverse/recording capability makes this a powerful machine	Dolby B/C, twin auto-reverse & record, parallel recording etc		69
<b>Memorex SCT-84</b> £200	Average+ Average+	The playback only transport is a little disappointing, but the record one is a quality item and the deck works well. Ergonomics are good, but styling and control feel are decidedly tacky.	Dolby B/C, fine bias, twin with auto-reverse record, unidirectional play	R	69
<b>NAD 6300</b> £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
<b>Nakamichi CR-1E</b> £345	Very Good Good	Modestly equipped by any standards, the CR-1E stands or falls by its build quality, which is high, and sound which is highly competent	Dolby B & C		57
<b>Nakamichi CR-2E</b> £395	Very Good Good+	Ordinary to look at, in some respects rather awkward to use (tape switching especially), the CR-2E sounds very slightly better than the CR-1E, and therefore ranks well. But it doesn't come cheap	Dolby B & C, bias adjust, remote control	R	57
<b>Nakamichi RX-202E</b> £545	Good Very Good+	Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control system	Auto reverse, Dolby B, C, 2 Head	R	63
<b>Nakamichi CR-3E</b> £595	Very Good Very Good	The user interface is a little clumsy, though conceptually straightforward. Sound quality approaches the CR-4E, and is amongst the best at the price.	Dolby B & C, bias adjust, remote control	R	57
<b>Nakamichi CR-4E</b> £745	Very Good+ Very Good+	High class deck with a reasonably full range of features and superb sound at a slightly unlikely price	Dolby B & C, bias adjust, remote control, 3 Head	R	57
<b>Nakamichi CR-5E</b> £995	Excellent Excellent	A slightly simplified version of the all-conquering CR-7, the CR-5 has a very similar standard of audio performance – the best	Dolby B/C, fine bias, 3-head	R	69
<b>Nakamichi CR-7E</b> £1500	Excellent Excellent	Remarkably this deck is not only ergonomically but also sonically superior to the Dragon, particularly on record/replay	Real-time counter, track search, Dolby B & C, tape alignment adjust, bias adjust, remote control, 3 Head	R	60
<b>Nakamichi Dragon</b> £1750	Excellent Excellent	Previous to the birth of the CR-7E, this machine stood head and shoulders above the rest. It is still the ultimate for music cassette replay	Auto reverse, Dolby B & C, tape alignment adjust, bias adjust, remote		60
<b>Onkyo TA-2120</b> £130	Average+ Good	Clear, vivid sound with good timing and resolution when using Type II tapes without Dolby. The controls are less inspiring – the meters in particular are plainly inadequate	Dolby B/C, auto tape sensing, block/side repeat	R	63
<b>Onkyo TA 2130</b> £160	Average+ Average+	Rating fairly well on both pre-recorded and record/playback, ergonomics were a little poor but overall performance was generally consistent	Track search, Dolby B & C, bias adjust		52
<b>Philips FC566</b> £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
<b>Philips FC567</b> £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
<b>Pioneer CT-656</b> £250	Good Good	Well conceived and executed low cost 3-head recorder. It benefits from and makes good use of metal tapes, but is never less than couth and stable sounding – even with ferric tapes	3 heads, off tape monitoring, fine bias, Dolby B/C/HX Pro	R	75
<b>Pioneer CT-737 Mk II</b> £350	Good Average+	Easy to use and sensibly equipped, the CT-737 is much improved, but sound quality is still a tad lacklustre	3-head, Dolby B/C/HX Pro, manual record bias/sensitivity		75
<b>Pioneer CT-91a</b> £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
<b>Proton AD-200</b> £140	Poor Poor	Sound quality is essentially on a par with many portables, and has nothing to do with high fidelity. The main problems are an unrelenting hardness and an almost total lack of detail	Dolby B & C		57
<b>Proton AD-300</b> £200	Average— Poor	High levels of flutter give sound a roughness and coarseness that rules it out for high quality work. The record and replay electronics certainly deserve better	Auto reverse, Dolby B & C		57
<b>Revox B215-S</b> £1481	Very Good Very Good+	This is a superbly engineered deck with a classically fine performance that almost transcends the stereotypes. Ergonomics are flawed but the user interface is both powerful and flexible	3-head, dual capstan, Dolby B/C/HX Pro, auto calibration	R	75
<b>Rotel RD-865</b> £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
<b>SAE C102</b> £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
<b>Sansui D-X30i</b> £150	Average+ Good	Lively, informative and well equipped basic deck, if rather obscure operationally	Dolby B/C/HX Pro, variable bias, track search	R	69
<b>Sony TC-FX110B</b> £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
<b>Sony TC-TX55</b> £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
<b>Sony (WMD6C) ProWalkman</b> £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
<b>Sony TC-RX60ES</b> £250	Average Average	For once a stable sounding auto-reverse deck but sound quality is rather 'dirty' and compressed, especially with Dolby C	Auto-reverse, Dolby B/C/HX Pro, auto tape recognition		63
<b>Sony TC-RX80ES</b> £350	Average+ Good	Clean, powerful and detailed sound, especially without Dolby C. Stable pitch – but prerecorded cassettes sounded disappointing	Auto reverse, Dolby B/C/HX Pro, bias/level adjust	R	63
<b>Teac V-250</b> £89	Average Average	Ultra-basic design which works quite well. Lack of pitch integrity is the main shortcoming, but it wasn't always noticeable	Dolby B	R	63
<b>Teac V-270C</b> £109	Average— Average—	Not quite cheap enough to compete solely on price, the V-270C is a rather messy and unstable sounding deck	Dolby B & C, bias adjust		63
<b>Teac V-285CHX</b> £115	Average— Poor	Poor, threadbare sound quality under most conditions of use. Cheap, but not a real bargain because it doesn't really work	Dolby B & C, fine bias adjust		75
<b>Teac W-355</b> £119	Poor Average+	A better than expected performer. Often a little ragged, even unsteady, the design is nevertheless quite lively and engaging. A viable basic twin deck machine	One record, one play transport, Dolby B		75

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## CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Teac V-480 £129	Average Average+	A rather utilitarian model, the V-480 just makes it on to our recommended list by virtue of a clean, open sound that to an extent transcends the measurements	Dolby B/C/HX Pro, fine bias	R	75
Teac W-450R £159	Poor Average+	This model does a great deal for the money. It has severe measured shortcomings, but sound quality that is almost good enough. Interesting, but not quite obvious material for commendation	Twin auto-reverse, one records, Dolby B/C/HX Pro		75
Teac W-470 £179	Average— Average	A low grade transport is allied to respectable electronics to give sound quality ranging between acceptable and good. Prerecorded tapes sound bright	Twin deck, one records, Dolby B/C, intro-search		75
Teac V-870 £399	Good+ Good	Cut-down V-970X for the proletariat. Expensive and carefully engineered with mostly very good but slightly cold sound quality	Dolby B, C, HX Pro, 3 Head, manual tape calibration	R	63
Teac V-970X £499	Very Good Very Good	An excellent sounding deck with useful features (tape calibration etc) that fully justifies the price	Real-time counter, track search, Dolby B/C/dbx & Dolby HX Pro, bias adjust, remote control, 3 Head	R	57
Teac W-990RX £499	Good Good	A mess with dbx, but taut and articulate otherwise. The 990, though expensive, has a powerful range of features, making it one of the few really ambitious decks to successfully straddle both sets of requirements	Dolby B/C & dbx, dual auto-reverse/record, parallel & sequential recording, remote	R	69
Teac R-919X £599	Very Good Average	Superbly equipped, yet usable – and well built too. But sound quality is something of a disappointment at this price level, being appropriate for a model about half the price	3-head auto-reverse, tape calibration, Dolby B/C/HX Pro/dbx		75
Technics RS-B355 £140	Good Good	Good sound let down by inadequate meters and poor prerecorded replay only sound quality	Dolby B, C, microphone inputs, cue and review	R	63
Technics RS-B505 £160	Average+ Average+	Neatly made recorder with Dolby HX Pro that sounds precise and stable, though sometimes a little processed and grainy too	Track search, Dolby B/C/HX Pro		57
Technics RS-TR255 £160	Average Average	Neat, sensibly designed middle of the road dual transport recorder, suitable where the ability to dub tapes is a particular priority	Twin transports, one records and auto-reverse, Dolby B/C	R	75
Technics RS-B605 £180	Good Average+	Mixed but generally good sound. Weakest points are dbx and prerecorded sound, best are Type IV (metal) recordings which sound sharp and precise	Track search, Dolby B/C/HX Pro & dbx		57
Technics RS-TR355 £200	Average Average	Serviceable middle market dual deck without serious fault but with some annoying inadequacies, notably an inability to play side A and B and then stop	Twin auto-reverse, one records, Dolby B/C/HX Pro		75
Technics RS-B705 £250	Average Average—	3 heads for the price of two, but not the sound quality to go with them	Track search, Dolby B, C, HX Pro, bias adjust, 3 Head		52
Technics RS-B905 £350	Good Good	Good, well set up cassette deck with a clean, accurate sound but some compression. dbx circuit sounds poor	Dolby B, C, HX Pro, dbx, bias adjust, 3 Head		57
Technics RS-T80R £400	Poor Poor	Flexible and pleasant to use but poor transports led to poor sound on our latest sample	Dual deck, auto reverse, track search, Dolby B, C, dbx		52
Yamaha KX-230 £140	Average+ Average+	A strong near-budget performer, the strengths include good overall sound, excellent search aids. Weaknesses: ergonomics, soggy bass with prerecorded material	Dolby B/C/HX Pro, variable bias	R	75
Yamaha KX-300 £160	Average+ Average—	Uncommonly well equipped and adequately made and presented, this model turned out to be a disappointingly uncertain proposition on audition	Track search, Dolby B, C, HX Pro with 'play trim', bias adjust, remote control		57
Yamaha KX-400 £200	Good Good+	A highly commercial package with every widget under the sun. Happily it sounds good too.	Auto reverse, track search, Dolby B, C, HX Pro, remote control	R	52
Yamaha KX-500 £210	Very Good Very Good	An accomplished performer, strongest in the areas of pitch and spatial stability, but slightly rough around the edges	Real-time counter, track search, Dolby B/C/HX Pro with play trim, bias adjust, remote control	R	57
Yamaha KX-800 £330	Good Average	The present Yamaha range seems oddly inconsistent. This sophisticated model sounds fine (almost) but came a clear second best to the KX-500	Real-time counter, track search, Dolby B, C, HX Pro with play trim, bias adjust, 3 Head		57
Yamaha KX-1200 £500	Excellent Average+	A veritable rats' nest of buttons and dials, albeit well laid-out. This is nearly a great recorder, but lacks simplicity of sound	Real-time counter, track search, Dolby B, C, dbx, HX Pro, bias adjust, remote control		52

## DAT RECORDERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa Excelia XD-001 £1300	Very Good Very Good	Clear and very listenable recorder roughly comparable to but slightly sweeter sounding than the Sony DCT-1000ES – but with an inferior front panel design	Track ID and search, remote	R	63
Grundig Fine Arts DAT-9000 n/a (system component)	Good Good	Conventional DAT recorder offering standard facilities. The deck is well made and equipped, and is engineered to a satisfactory quality standard. It performs to an acceptable standard, though it is not state of the art	2/4 hour recording, mic inputs, digital in/out		69
Luxman KD-117 £1499	Good Good	Slightly soggy, earth-bound sound quality, this model trails the other DAT decks tested so far	Two analogue inputs, remote twin address		63
Sony DTC-M100 £799	Very Good Very Good	Clean, clear sounding 2nd generation model with most of the features and sound of the DTC-1000ES	Midi-width, alpha-numeric display, remote, optical interfaces	R	63
Sony DTC-1000ES £1299	Very Good Very Good	Fine, consistent performer with accomplished tape handling and good build quality	Standard track ID and search, remote	R	63

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## CD PLAYERS

This all-digital music source is well established, despite still high disc prices and the opposition of many hi-fi enthusiasts. Compact Disc's strengths over conventional vinyl are complete freedom from surface noise with automatic and programmable play, plus track skip and fast music scan – frequently under full remote control. However, many vinyl enthusiasts find CDs sound less involving than

top quality vinyl replay.

Introduced five years ago at around £500, CD players now average less than half that price, and for the main offer improved performance besides. Even cheaper players may have the latest decoding chips and the most useful play features; extra money can buy remote control, remote volume control, audio 'tweaks', plus improved build and component

quality control.

Compared with many hi-fi components, CD players give impressive lab performance, though there are differences between players nonetheless. **Sound quality** variations are even more marked, particularly in a good quality system. As it behaves very like a preamp, there are no problems connecting a player to a normal amplifier.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
ADC CD 2000E £330	Good+ Fair+	One of the slimmest players in the business but nothing special inside. Nice ergonomics but overpriced	Remote, timeshared 16 bit		64
Aiwa DX-M45 £149	Fair Fair	Cutdown Philips technology, but results are quite good for this British made machine	Manual	R	64
Aiwa XC-005 £280	Average Average+	Very comprehensively equipped including double digital and audio outputs. The average performance was still sufficient for recommendation at this price	Power vol, edit-dubbing, shuffle 2 digital op	R	76
Aiwa CD-001 £300	Good Good	Pretty close to Recommendation, delivering a respectable sound quality and lab performance from an ergonomically attractive package, but ultimately failed to excel in any particular respect.	Track entry/volume remote, direct recorder connection etc.		58
Aiwa XC-007 £499	Very Good Good	Creditable sound despite inverted output, high tech engineering with very good lab performance. A worthy contender but not cheap	Remote, keypad, timer, digital output, pseudo 20 bit, dual DAC		64
Akai CD-52 £249	Good Good	A nice surprise from Akai, genuinely good sound from this mid-priced model. Better linearity will help further	Remote, digital output, headphone socket	BB	64
Akai CD-62 £330	Fair Very Good	Looks, build quality and the technical specification are right up to date. As it stands it sounds very good but if the indifferent lab performance could be improved, it would probably sound even better.	Remote, programme, hdph, comprehensive display etc	BB	70
Akai CD-73 £450	Good Average	A little uneven musically, the Akai tends to smother fine detail, but has first class dynamics and stereo imagery. Worth auditioning	Track entry keypad remote, menu display (switchable)		62
Akai CD93 £700	Good Very Good	Undoubtedly a CD player of real class in build, presentation, lab performance and sound quality, but also a shade expensive for formal Recommendation – though that's not to dissuade lovers of black lacquer wood finish.	Track entry remote, menu display etc.		58
Arcam Delta Black Box £250	n/a Very Good	This rich, powerful and articulate sounding DAC transforms the majority of medium price CD players	Needs D-out CD players	R	60
Arcam Black Box II £299	Very Good Very Good	An addition to the BB I, it also offers improved sound and more inputs	Optical and wired input digital decoder	BB	76
Arcam Delta 70 II £550	Very Good Good	Now in Mk II form a further improvement is seen in features, performance and sound quality. Solidly built and British	Now adds simple remote vol + std features; also display off	R	76
Arcam Delta 170 Transport £599	Very Good Very Good	While no bargain, this is a well made metal boxed transport providing clean digital data for outboard decoder/processors	Transport only, display off, usual programming	R	76
Cambridge Audio CD2 £650	Fair Very Good	The finest midrange in digital audio is sufficient grounds for Recommendation, though there remains a tinge of disappointment that the CD2 didn't get closer to big brother elsewhere, notably in the bass.	16x oversampling, remote control	R	58
Carver TL 3100 £340	Average Average-	The sound quality did not live up to the excellent fascia. Carver's DTL did not aid the indifferent sound	DTL sound shaping, usual facilities, remote, memory		76
conrad johnson DFI £1,995	Average- Good+	Setting a decent standard and including an FET line preamplifier, the unusual DFI is worth investigating	Line preamp built-in, simple remote facilities		76
dbx DX5 £640	Good Poor	Sound quality proved a single disappointment, though it's refreshingly unique in providing semi-pro post-production facilities that some users will undoubtedly relish.	Track entry/volume remote, compression, impact recovery, ambience etc.		58
Denon DCD 610 £200	Good+ Fair+	Lots of Denon player for the money, well equipped with good all round performance	Remote, versatile programming 2x 0/S	BB	64
Denon DCD820 £249	Average+ Average-	A powerful combination of features and build for the money ensures recommendation. The sound is just good enough	Well equipped, power vol, edit etc, digital out	R	76
Denon DCD 810 £250	Very Good Fair+	A good value allrounder bettered on sheet value by the 610 and 910; power volume could sound better	Remote, 4x oversampling, programming	R	64
Denon DCD 910 £300	Very Good Fair+	A well equipped deck of impressive appearance and solid sonic and lab performance	Remote volume, programming, 8x 0/S digital output	BB	64
Denon DCD1420 £400	Very Good Average	Superbly equipped with a fine lab performance, this modern player needs a touch more sonic spice to be recommended	20-bit, very comprehensive, remote, power volume etc		76
Denon DCD-1500II £500	Very Good Very Good	The extra build quality over cheaper Denons is justified in terms of sound quality and lab performance, while the feature list is comprehensive and quite nicely presented.	Track entry/volume remote, menu display etc.	R	60
Denon DCD-1520 £500	Very Good Very Good	High tech, high profile, high gadget content, good sounding player at an almost affordable price.	Programme, hdph socket, remote, track entry, optical digital output	R	70
Denon DCD 1700 £650	Good+ Very Good	The overall sound was strong and coherent approaching reference standards. Fine build quality and facilities make this a firm contender	Remote, skip, scan, headphone socket, programmable	R	58
Denon DCD 3520 £1000	Very Good Good+	Built like a battleship this new model takes its place at the top of the Denon range with a smooth and powerful sound, quite free of graininess	Composite 20-bit DACs, full programming features	R	72
Denon DCD-3300 £1200	Good+ Very Good	Sounding tight and coherent though not significantly better than the cheaper 1700. Very well built and comprehensively equipped	Remote control, with volume, keypad programme, scan, search, headphone		51
Dual CO 1030 RC £170	Fair Fair	An up and down performance on test but it is hard to deny the overall value for a machine that includes remote control at this price	Remote, headphone socket, 2x 0/S, timeshared 16 bit	R	64
Ferguson CD007 £130	Good Fair	The cheapest recommendation in the test group; don't expect the earth but the value is good	Manual, digital output, headphone socket	R	64
Ferguson CD008 £150	Fair Fair	Not as strong as its relatives, sample fault perhaps? Though performance is fair enough overall	Remote, midi digital output, 2x 0/S, timeshare 16 bit		64
Goodmans GCD300 £129	Average Average	It may be adequately made, but with cheap good sounding players available this particular Goodmans isn't quite good enough	Programmable, skip, search, repeat		70
Goodmans GCD550 £199	Average+ Fair+	A slow autochanger with a weakish lab performance but the sound is fair enough, the features good and the price is low	Remote, 6 disc autochanger, 2x 0/S	BB	64
Goodmans GCD555 £219	Average Average-	Scores approval on grounds of low price. You must pay more for better sound and a faster mechanism	6 disc changer, 32 track memory, remote etc	R	76
Grundig CD9000 £1000	Good Good	Aimed at a market which puts external styling above sound quality. Although this player is of slightly above average competence in most departments it is expensive	Remote, programme, hdph socket, calendar display etc		70

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## CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
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-8010 £449	Good Fair	Top build quality and novel technological features seem to achieve little success here. While the technical performance is fine, the sound quality doesn't match its competitors	Track entry remote, memory display, sprung feet, optical digital output etc		70
Luxman D-90 £300	Fair Good	Despite technical ingredients that do not seem particularly inspiring, this is a nicely judged package that is ergonomically neater than most, with decent sound quality for the price and distinctive finish and presentation.	Track entry remote, programming etc.	R	58
Marantz CD583 £169	Very Good Good	Devoid of all but the CD essentials it makes up for in sound quality what it lacks elsewhere	Memory, track skip, search, etc	BB	70
Marantz CD85 £500	Very Good Very Good	This player may just miss a top sonic rating but it's well made and has plenty of features befitting a Marantz heavyweight	F.T.S., key pad remote, comprehensive display, programming, optical output etc	R	70
Marantz CD94/CDA94 £1600	Very Good Very Good+	This two-box combination delivers reference standard lab and listening test results, albeit at a price which seems a little steep. Very refined	Favourite track selection, remote, balanced output etc	R	60
Marantz CD12LE £2500	Very Good Excellent	This top of the range two-box player may be very expensive but it is very well made. Technical performance is very good and the sound is the best from Marantz yet	Two box, digital processor, F.T.S., optical connection, hdph socket, comprehensive display, balanced output etc	R	70
Meridian CD207 £1050	Very Good Excellent	The 207 matures with age and in its present form it offers one of the best sounds around plus great packaging and versatility through its preamp options	On-board preamp, options, two box, coax digital output, remote	R	72
Micromega CDF1 Classic £1400	n/a Very Good	A very well made and stylish player from France, the CDF1 is a CD player for analogue lovers or as close as we've come across	Basic remote, digital output, suspended chassis	R	72
Micro Seiki CDM100 £3850	Very Good Good	One of the hernia inducing bricks of hi-fi, the Micro is extravagantly styled, finished and built. The good lab performance led to an 'only good' sonic display when the price demanded excellent	Balanced output, remote, display blanking		72
Mission PCM2 £500	Good+ Good	A matured design with good features it is the best sounding power volume player available, it even tests well. It accepts the £200 PSX power supply option	Remote volume, display and phase invert	R	64
NAD 5320 £169	Average— Average—	A low cost player devoid of features but at this low price it should still offer better sound	Budget facilities, 20 track program		76
NAD 5220 £230	Average— Poor	Conforms sonically to a stereotype of the medium that most players have grown out of. Hard, thin and raw sound with poor stereo and resolution.	Time/track display, memory		62
Nakamichi OMS-1E £395	Good Good	This neat enough player doesn't really follow the Nakamichi tradition of providing exceptional sound quality while at the same time perpetuates that of selling at an above average price	Simple remote etc.		58
Nakamichi CDP-2E £495	Very Good Good	It's ergonomically superior and has above average sound, but it isn't cheap. The standard of build quality and finish is first class which isn't quite matched by the sound quality	Programming, hdph, remote track entry, digital output		70
Nakamichi OMS-4E £1200	Very Good Very Good	Solidly controlled and comparatively simple this clearly represents one of the major benchmarks for CD sound quality, though the midrange sounded a touch thin	Skip and scan, headphone socket		51
Nakamichi OMS-5EII £1500	Good+ Very Good	"... delivers near state of the art performance and build quality in a deliberately starkly functional package, but at a very high price..."	Skip and scan, simple track programming, manual control		51
Nakamichi OMS-7EII £2000	Good+ Good	The only serious criticism here is of the price. And in our not always humble opinion you can get better sound quality for less elsewhere in Nakamichi's range	10 digit track entry keypad programming, headphones		51
Onkyo DX-1500 £170	Average Fair	Ruled out on the grounds of its poor DAC filter, but it's not so bad really given the price	Manual, 2x O/S, timeshared 16 bit		64
Onkyo DX-3500 £250	Very Good Fair	It offers a lot of facilities and fine build quality for the money. Lab performance is very good but the sound quality doesn't inspire	Key pad remote, memory, hdph socket, comprehensive display etc		70
Onkyo DX-7500 £450	Good Very Good	This comes close to the state of the art performance in many areas. It has lots of facilities and is well made too.	Key pad remote, memory, hdph, very comprehensive display, optical digital output etc	R	70
Philips CD610 £160	Average+ Average	Built down to the price the sound is OK while the package performance and features constitute fine value	Remote, hdph, programming etc	BB	76
Philips CDC875 £300	Average+ Average—	The changer works well and this machine is very well equipped. The sound quality is below par but may not matter too much in its likely 'muzak' application	6 disc changer/dig op remote, hdph, memory, shuffle		76
Philips CDV185 £350	Average+ Average	Hard to value with the video singles facility but it all works well enough for a recommendation	Video singles + CD scart + digital out etc	R	76
Philips CD880 £500	Very Good Very Good	The '880 is an impressive blend of luxury build quality and features at a far from extravagant price, and also delivers the subjective goods.	Volume remote, F.T.S., menu display etc.	R	60
Pioneer PDM710 £350	Good Average	A fine multi-changer with excellent memory programming; fully featured, sounds fine but no digital output	6 disc changer, 40 track memory + multi memory full remote, hdph, etc	R	76
Pioneer PD9300 £450	Excellent Average	A mid price flagship of excellent build and lab performance but only average sound — interesting though	Remote, 24 track programming, 2 digital op		76
Pioneer PD-91 £800	Excellent Very Good+	Close to state of the art in nearly all areas — soundstaging, clarity and simple lack of artificiality. A well made and sophisticated player	Track entry remote, calendar display, index search, etc.	R	64
Proton AC-120 £180	Average Average—	Fine styling, low price but barely average performance	15 track memory, simple design, remote, hdph		76
Revox B126 £649	Very Good Good	Made in Switzerland so the build quality and technical performance is high but then so is the price and the sound quality is only good	Programming, Revox remote system compatible		70
Revox B226S £840	Good Average	Top quality build and finish for the Revox system enthusiast. For high value sound look elsewhere	Remote vol, hdph, 19 track memory, digital op		76
Rotel RCD820B £210	Good+ Fair+	A budget Philips based player of dependable sound quality and offering very good value. Build is a touch lightweight	Remote, basic facilities	BB	64
Rotel RCD820BX2 £250	Good Very Good	Start with a good base and then make it sound better, the '820BX2 CD player maintains the reputation established by its namesakes, and comfortably deserves Recommendation.	Direct track entry remote etc.	R	58
Rotel RCD855 £250	Good Good+	Stripped for action this well built Philips technology player delivers fine performance and sound. First rate value	Remote, 20 track prog, 1 audio op, 1 digital op	BB	76
SAE D102 £700	Good Good	Considering the high price of this player, most of the innards seem fairly prosaic. Sound quality and lab performance are both respectable enough, but hardly justify the price premium involved, though styling is unusual.	Remote (inc volume), skip, scan etc.		58
Sharp DX150 £129	Fair Fair	This is a none oversampled player which is rather outclassed for technical and sonic merit by the vast majority of the competition. Pretty enough but would you want to put discs in it?	Programmable, skip, search, repeat		70
Sharp DX750 £179	Fair Fair	It has a remote control but it's too like the 150 which is rather outclassed for technical and sonic merit by the vast majority of the competition	Remote, programmable, skip, search, repeat		70
Shure Ultra D6000 £495	Average+ Fair	Ergonomically well thought out with full function remote control, but not really scoring sonically considering its price	Remote control (full function inc volume)		51

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MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Sonographe SD1 (by CJ) £799	Good Very Good	Distinctive with oak end-cheeks, using Philips based 14 bit x 4 oversampling, Conrad Johnson electronics make this a musically rewarding player	Full search programme and timing	R	51/Coll
Sony CDP-M55 £190	Fair Fair	£20 buys a remote control handset to operate your M35. Sony call it an M55 (see CDP-M35 review).	Simple remote, skip, scan, programming etc.	R	58
Sony CDP-M75 £230	Good Good	This midi version of the '750 saves £20 on the price (see CDP-750 review).	Track entry remote, menu display ect.	BB	58
Sony CDP-C50M £250	Fair Fair	The Sony concept of an autochanger is interesting and executed with characteristic thoroughness. The lab and sound test results reveal it to be of only average quality	Carousel autochanger, remote, multi disc programming, variable hdph socket		70
Sony CDP-M95 £280	Very Good Fair+	Very well equipped mid sized player fine build and finish, incorporating Sony's custom file disc labelling	Remote, programmable, variable hdph output	R	64
Sony CDP-228ESD £400	Very Good Average+	Good value, this is Sony's best mid price design and comes superbly equipped	hdph, remote, rem vol, custom file	R	76
Sony CDP-338ESD £550	Excellent Good	Only a bit better than the 228 the 338 is a good machine, but not quite good enough for formal recommendation at the price	Custom file, remote, rem vol, hdph, shuffle etc, 2 digital op		76
Sony 557ESD £1000	Excellent Good+	Superbly built flagship model that produced excellent lab results and very good sound. Many luxury features though not that good value	Full remote, disc directory, digital output, power volume, 8x 0/S, 18 bit		64
Sony CDP-X7ESD £1300	Good+ Average	A Sony flagship, build and finish is exemplary, styling is unusual but the sound is just average	Custom file, remote, 2 digital op, balanced audio + phons		76
Sony CDP-R1/DAS-R1 £5000	Very Good Excellent	Sony has aimed high with the R1 and in some ways has created the reference player. Build quality is amazing and it offers a high level of facilities. One or two faults were revealed in both the lab and the listening, but it's generally excellent	Two box, dual optical connection, digital processor, FTS, remote		72
Stax Quattro £2995	Very Good Very Good	Now in 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 PD470LE £279	Average Average	With the LE upgrade the 470 has improved to a just average position	Remote, hdph, 20 track prog		76
Teac ZD880 £450	Good Fair	Decent enough in most respects with a very good build and finish. Its sound isn't competitive enough to inspire any real enthusiasm	Remote, track key access, auto space, comprehensive display, hdph socket etc		70
Technics SLP202 £160	Very Good Average-	A competent budget player; no frills but a good value performance and build quality. Buy the similar SLP227 if you want remote control	Simple facilities, 20 track program, no rem	BB	76
Technics SLP-333 £250	Good+ Average	A decent enough player lacking that final edge necessary for review distinction	Dubbing edit, hdph, digital out, rem vol remote, 20 track prog		76
Technics SLP-555 £300	Very Good Average	A well balanced, well made player delivered at a very fair price. Good facilities for cassette dubbing	Peak level detection, remote, rem vol, hdph digital op	R	76
Technics SLP777 £350	Very Good Average	A higher quality version of the 555, it may impress with its extra facilities. Performance is similar to 555	Display off, full remote, audio level meter, 32 track prog, hdph digital op		76

## CD MIDI SYSTEMS

So you want a hi-fi, but you don't want to make a fuss about it. A pre-packaged system with everything matching up and no aggravation may not rank with carefully chosen separates on **sound quality**, but there's no denying the attractiveness or popularity of this approach – the market for pre-packaged component hi-fi systems is at least as big as that for separate items, even ignoring the vast numbers of low-cost single unit stacker systems.

The arrival of compact disc led to a new fashion for shelf-standing compact systems, or 'midis' as

they are known in the trade, as a replacement for earlier floor-standing rack systems (themselves the upmarket development from music centres). Only some 330mm wide, midis can more or less match full-size (430mm) rack components for performance, and are certainly cheaper to make, ship, sell and buy.

Whereas specialist hi-fi is moving steadily towards ultra-simple 'no frills' components, midi systems tend to be sold on a feature count at a price point, usually with little opportunity for

demonstration and comparison. Our test programme includes extensive auditioning and lab testing, while making allowance for the different aspirations of designers and expectations of users. Key features valued highly by customers include system remote control, automatic switching, double 'dubbing' cassette decks, and elaborate equaliser tone controls. And the top end of the market is developing with surround sound audio/video-ready packages.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa X-D80K £550	Poor Poor	Congested and harsh sound quality, the cassette deck, amp and loudspeakers being well below par. The built-in timer adds some operational flexibility	Auto-reverse, CD synchro record, remote, timer		77
Aiwa X-D100 £1000	Average- Fair	Very fully equipped with wide ranging in and outputs but poor upgradeability. Sound quality is reasonable on the whole	Digital & optical in/outputs, dual auto reverse, disc file CD etc		77
Akai M.50CD £550	Poor Poor	Cassette lacks Type II compatibility, general sonics mediocre or less	Devolved from M.80 but simplified, part remote		65
Akai M.80CD £800	Good Good	Good all rounder with minor ergonomic shortcomings but generally practical layout	Separates based, twin auto-reverse cassette	R	65
Ferguson HFD28 £300	Poor Poor	Similar to Goodmans 5000 system but with greater power and marginally superior sound	One-piece, semi-remote		77
Goodmans 5500 £320	Poor Poor	It offers the basic features (but no Dolby or magnetic cartridge) and rough and ready sound	One-piece, remote		77
Goodmans 5300CDM £400	Average- Average+	Crisply styled system with gutsy amplifier and sophisticated speakers. CD player works well, other sources are variously mediocre	Combined cassette/tuner/amp, plus T/T and CD with remote	R	65
Goodmans Maxim-Midi System £520	Average Average+	De-luxe version of 5200 system – very good value for money and readily upgradeable. Sonics rough but OK and speakers good; CD crude	All separates with twin cassette	R	54
Grundig Studio Line 1 £330	Poor Average+/ Poor	Intriguing package with warm, woolly but attractive sound let down by poor attention to detail and suspect cassette deck. Amplifier appears to be inadequately protected	CD/cassette tuner plus preset equaliser		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-W900CD £1000	Good Good+	A competent allrounder, with important convenience related features, and powerful linked recording facilities. Less strident speakers would be appreciated	Separates system, equaliser, auto-reverse cassette	R	65
JVC Midi-W91CDM £1111	Good- Average	Very well equipped (viz. multi-disc player, powerful tape related features) with acceptable but rather nondescript sound	Multi-disc player, twin auto-reverse cassette, equaliser		77
Marantz MX493AVCD £549 with LD20 speakers, £449 without	Average Mixed	Good source components (ex cassette) let down by poor amplifier. Flexibility is strong point, and the system may prove attractive where the A/V possibilities can be fully utilised	Twin auto reverse, opt speakers, surround processor etc	R (with LD20)	77

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NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Marantz MX583 £750	Average— Poor	The system has potential in an A/V context, but is patently lacking in a purely audio one. Only the CD excels	Component system with A/V amp, no speakers		65
Marantz MX673CO System £900	Average+ Average	Tremendously flexible audio/visual system. Sound quality is satisfactory at best and ergonomics a mess	Various A/V inputs, remote, speakers optional		54
Pioneer S-11 £510	Average— Average—	Fine lower middle market system, with one useful extra – the built in timer. Only the record deck is disappointing	Twin auto reverse cassette, built in timers, one piece amp/cassette		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
Proton AI-3000 £550	Good Good	There are a host of minor problems, including no LW, but the unit is attractively packaged and can be made to sound very good despite a woolly sounding amplifier	One piece CD, cassette, tuner and amp, remote	R	65
Sanyo 39CD £260	Poor Average—	Acceptably compromised basic low end system, offers broadly respectable if unambitious music making for those on a tight budget	One piece + CD, non-remote, manual tuner		77
Sanyo 49CD £300	Poor Average—	Similar to 39CD, but with Dolby B, preset tuning, remote control and more power. Audio wise, it's more of the same, but there's greater stature when loud and cassettes are helped by Dolby B	One piece + CD, partial remote control, digital tuner	R	77
Sanyo 59CD £380	Average— Average—	Adequate performance overall, though endemic lack of pitch integrity takes edge from tape and records. Some inconsistencies in control system too	As 49CD, + full remote, auto source select, separate turntable		77
Sharp CD-X17E £550	Average Average+	Highly specified miniature with detachable speakers. AC mains power only. Good sound let down by crude upper midband and treble. Expensive for what it is	CD luggable with dual cassette & tuner, detachable speakers		77
Sharp SA-CD800H £700	Average Average—	A superficially high grade, high spec system, the SA-CD800H actually sounds clean but a little 'synthetic'	One-piece, 6-disc CD, no T/T		54
Sony Compact 301CD £400	Average— Average	Mainly crisp, articulate sound and excellent ergonomics offset by modest FM results and lack of pitch integrity on cassette	Twin unidirectional cassette, equaliser, 30 preset tuner etc		77
Sony 501CD £500	Average Average	Fair all round performance except noisy FM. Ergonomics and visuals good, but no auto source select, tuner stereo defeat	Twin auto-reverse, 3-band tuner, equaliser etc	R	77
Sony Compact 500CD £550	Average+ Average+	Impressive visuals are matched to electronics which in audio terms lack inspiration. The speakers are particularly poor	Combined amp/cassette, 36 preset tuner, T/T component CD		65
Sony Compact 700CD £700	Average+ Good	Loudspeakers and (to a lesser extent) turntable spoil a fine sounding and stylish – if rather costly – package	Separates system, auto reverse cassette, 36 preset tuner		65
Sony Compact 701CD/711CD £700/£800	Average+ Good	Sound quality good all round, though cassette pitch accuracy is below par. Features average but system control is weak	Twin auto-reverse, graphic equaliser (711 only), 30 preset tuner	R (701CD)	77
Sony Series 1000CD £1500	Very Good Excellent	Very sharp, articulate sounding system from CD and FM. Cassette deck good and flexible, turntable as usual is not in keeping	Separates system, twin auto-reverse cassette, amp with DAC	R	65
Technics X900CD £470	Average Average—	Good build and mostly good sound is offset by mediocre amplifier and loudspeaker and some operational oddities	Main cassette/tuner/amp, separate T/T and CD		65
Technics X1 £500	Good Good	Superb value for money from a system with solid straightforward engineering at an attractively low price	Auto-reverse record transport, auto-disc/tape editing, surround sound, remote	BB	77
Technics X5D £800	Very Good Very Good	A mainstream system offering considerable flexibility and power in a traditional suit of clothes, and embodying values that place music first	Twin auto-reverse, tuner/timer, auto record deck, digital amp	R	77
Yamaha AST-C10 £600	Average+ Very Good	Brilliant if flawed luggable with weighty, powerful bass, and a rare combination of expressiveness and clarity unprecedented from such a small package. Good features.	Mains portable twin cassette/CD/radio system detachable speakers, remote	R	77

## TUNERS

The radio medium operates at a much lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live Prom concerts can rival all other sources from a hi-fi perspective. Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for receiving certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen amplifier

cosmetically. However, the task they carry out is far from simple (or cheap), combining the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on local reception conditions, but money invested in a high quality outside aerial system is well spent.

Tuners come in two basic types. Analogue models tune gradually (and usually manually) across

the bands, and can have analogue or digital displays; they are often preferred for sound quality, and are certainly best for AM bands. Digital tuners offer convenient automatic tune facilities and hold many station positions in pre-set memories.

(The Lab and Sound results for models tested in issue No. 65 refer to FM only. For AM results see under Comments.)

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai AT-52L £150	Very Good Very Good	Holds its own on FM against many much more expensive tuners, but AM is very poor	All bands	BB	65
Akai AT-93L £250	Good+ Good+	By AM standards presentable (good) while FM delivers the goods	All bands, aerial switch	R	65
Arcam Alpha £149	Good Average+ +	Attractively classic British analogue tuner with sound quality comfortably better than most	FM/AM Analogue	BB*	50
Arcam Delta £270	Very Good Very Good	Hi-fi sound on FM, good on AM, a dependable British all-rounder	6AM, 6FM presets. FM/MW. LW display manual tune	BB	55
Denon TU 450L £130	Average+ Average+	Poor AM sound quality may be a deterrent but the FM performance fully merits recommendation	FM/AM Digital MW/LW	R	50
Harman Kardon TU920 £299	Good Average	Rather weak sound quality for the price despite good lab test results	16 presets, AM/FM, digital auto scan, active tracking		55
Harman Kardon Citation 23 £559	Good Very Good	Fine performance, interesting features and ease of use are this tuner's forte, and the sound quality is top notch	FM/AM seek/manual adjustment muting 16 presets remote control	R	60
Hitachi FT-MD 5500 £200	Excellent Good+ +	A powerful, good sounding tuner with versatile facilities	16 presets, FM, AM, MW auto scan digital, signal meter	BB	55
Kenwood KT-660L £130	Fairly Good Fairly Good	You get your money's worth of gadgets and the radio's basically sound although programming is complicated. AM – fairly good	Timer, clock, all bands	R	65
Kenwood KT-1100D £300	Good+ Good+	Behind a gaudy and rather useless display the radio is much better than you might first think. AM – good	Firework display. FM/MW bands only	R	65
Linx Theta £400	Good Very Good	A Magnum Dynalab on the cheap with the hallmark styling of this small British newcomer. Some of the best midrange from any tuner	Manual analogue tuning, no presets, signal strength meter	R	72
Magnum Dynalab FT101 £599	Good Very Good	Although expensive for its fairly minimum set of facilities its excellent sound makes up for what it lacks elsewhere	Analogue manual tuning, no presets, signal strength meter	R	72

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NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Marantz ST35L £125	Good+ Average-	It works well enough but the sound could be better for the money	16 presets, AM/FM, digital auto scan, active tracking		55
Meridian 204 £525	Good+ Good	Pleasant sounding with a fine finish but does not make the grade at this price	FM only, auto scan, digital, remote, clock timer		55
Musical Fidelity TI £300	Good+ Very Good	Top class FM stereo sound on good signal strengths from this audiophile model. Watch out for local CBI!	FM only, analogue box dial, manual tune, signal meter	R	55
NAD 4020 £139	Good Average+	Not the quietest or most sensitive tuner tested, it still provided good sound for the money, being "musical and ambient"	Analogue FM/AM	BB	50
Naim NAT 01 £1098	Very Good Very Good	There may be better sounding tuners in the world, but we have yet to hear one	No presets. Two box, flywheel tuning FM only, Analogue	R	50
Nakamichi ST-7E £750	Good++ Good+	Exceptionally good for weak-signal areas, and good all round	16 AM/FM presets, Schotz enhanced sensitivity, auto time digital		55
Onkyo T9090 II £590	Very Good Very Good	It has most of the facilities you could possibly want and more beside. Lab performance and sound quality are both good enough to ensure recommendation even at this price	FM only, digital, 20 presets, auto scan etc.	R	72
Pioneer F91 £350	Excellent Good++	Easy to use, this model has excellent RF performance and scored very high ratings on the listening tests	FM/AM 24 presets	R	60
Proton AT-300 £199	Good Good	The AT-300 is pretty on the outside, orthodox on the inside and rather dear. AM - poor	FM/MW only	R	65
Quad FM4 £289	Very Good Good+	Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7 presets. Digital	R	50
Revox B260 £918	Excellent Very Good	Sophisticated and expensive, the B260 is ideally suited to the rest of the Revox range and should also work well in other systems	FM - virtually everything	R	60
Rotel RT-830AL £110	Good+ Good	Fine sounding budget audiophile material, no frills, no fuss	Manual dial analogue, FM, MW, LW	BB	55
Rotel RT-850AL £160	Good+ Good+	Scoring well on listening tests and one of the best sounding tuners at its price level, it was a bit let down on AM but RF performance was good	FM/AM, digital	BB	50
SAE T-102 £449	Good+ Good+	Expensive for all the radio you get, but sounds interesting. AM - Poor	FM/MW only	R	65
Sony ST-S300L/ ST-S100L £140/£100	Good Good	A reasonable entry point, not for difficult areas. AM - Poor	All bands	R	65
Sony ST 500ES £200	Good++ Average-	Disappointing sound quality but good lab performance. (Includes long wave)	10 AM/FM presets, auto scan digital		55
Sony ST-S 700ES £299	Very Good Very Good	First class in every respect including FM sound quality. Even AM was well above average	FM/AM, 10 presets, digital scan	BB	60
Yamaha TX-L400 £130	Good++ Good+	Good FM sound, let down by poor AM but otherwise good value	16 presets, auto scan, digital, FM, MW, LW	BB	55
Yamaha TX-500 £150	Average+ Average	Under a gaudy coat, this sensitive tuner gave reasonable stereo results. However, the AM had again been thrown down a well	20 presets (10 buttons) digital		50

Rating refers to original, tested model

## HEADPHONES

There are a variety of different approaches to headphone design, and examples of each turn up in this group. Amongst the more expensive esoteric models, electrostatic drivers are used in square open-backed phones such as the Jeklin and Stax models. The majority of these come with some form of transformer which takes the signal initially from the speaker terminals on the amplifier. The actual speaker cables then travel from this unit via

bypass switch to the loudspeakers.

The more down to earth models feature dynamic drivers in circular open-backed designs. The advantage of open backs seems to be a correspondingly open sound and a less claustrophobic feel to the music. One can also of course hear external noises and irritate people on public transport.

The third category are closed-back designs,

which are useful in situations where it is necessary to block out background noise.

Another means of distinguishing different types is the way they sit on your head or ears. There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs press on the outer ear (pinna); and intra-aural types rest inside the ear and are popular amongst users of personal stereos.

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Aiwa HP-X30 £30	Good Good-	A flashy personal stereo phone which alternatively could be used at home. A slight LF tonal preference slightly colours the response, but it ain't a bad can	Supra-aural, closed-back, dynamic		75
Aiwa HP-V99 £50	Good- Average+	Horn loaded in-ear miniatures with plenty of guts but not enough transparency or bass to compete with the headbanded competition	Intra-aural, closed-back, dynamic		75
Aiwa HP-X80 £50	Good Good	A headphone that's highly suited to non acoustic music and portable sources, nicely made and slickly finished. Sound quality doesn't quite match the price	Supra-aural, closed-back, dynamic		75
Aiwa HPEX-200 £90	Good Good	Modern looking and well finished the Exceltas, as they are dubbed, had meaty bass and sounded reasonably open for the type	Circumaural, closed-back, dynamic		63
AKG K135 £35	Poor Fair	Despite a very appealing design the K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural, semi-open, dynamic		63
AKG K145/S £58	Good+ Good+	Electrostatic tweeters combine with a dynamic mid/bass unit to create very confident sounds in a comfortable headphone. Balance is on the bright side	Supra-aural, semi-open, electrostatic/ dynamic	R	75
AKG K240 Monitor £60	Very Good Good	Something of a classic these AKGs are very user friendly in all respects; sonically on the warm side of neutral	Circumaural, semi-open, dynamic	R	63
AKG K280 Parabolic £110	Good Very Good	A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural, open-backed, dynamic	R	63
AKG K340 £136	Good Excellent	Heavyweight cans in most respects, the K340 with its electrostatic tweeter is a very revealing headphone. Gives the total electrostatics a good run for their money	Circumaural, closed-back, electrostatic/dynamic	R	75
Audio Technica ATH 909 £55	Average Average	Quite impressive in the treble though a bit bass shy, the 909s worked well at high levels	Circumaural, semi-open, dynamic		55
Audio Technica ATH 910 £65	Average Good	The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural, closed-back, dynamic	R	55
Audio Technica ATH-911 £75	Very Good Very Good	Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural, open-backed, dynamic	R	63
Beyer DT 325 £30	Very Good Fair	Lightweight in more ways than one, the 325s may be a little bright for some systems and tastes but will suit duller sources	Supra-aural, open-back, dynamic	R	63

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## HEADPHONES

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Beyer DT330 Mk II £45	Good Poor	Not the most revealing 'phones encountered, the 330s were nevertheless enjoyable and rarely offended	Circumaural, semi-open, dynamic		55
Beyer DT550 £69	Good Good	On their own the 550s sound articulate with a slightly 'gritty' treble and 'keen' midrange; not suitable for headbangers!	Circumaural, semi-open, dynamic		55
Beyer DT880 £90	Good Good	Well made cans with a warmish sound but fairly solid midrange, though they're not that informative for the price	Circumaural, semi-open, dynamic		63
Beyer DT990 £119	Very Good Very Good	The 990s are definitely a significant pair of dynamic headphones; they have a smooth and yet revealing, neutral sound that is hard to criticise.	Circumaural, open-back, dynamic	R	55
Beyer IRS690 £200	Good+ Very Good	High quality infra-red headphones with soft comfy earpads and mellow but informative sound quality which is hard to dislike	Circumaural, open-back, dynamic	R	75
Jecklin Float Model One £79	Good Very Good	Whilst very unusual in appearance the Floats give remarkable sound quality and openness at a reasonable price	Circumaural-ish, open-back, dynamic	BB	55
Jecklin Float Model Two £99	Good Very Good	Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. Note lack of adjustment means you should try before you buy	Circumaural-ish, open-backed, dynamic	R	63
Jecklin Float Electrostatic £399	Good Excellent	One version of the state-of-the-art, these electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural-ish, open-back, electrostatic	R	55
JVC HA-D990 £65	Good+ Good+	Good looking well made cans that offer good sound quality for the money. Sonic nature is of the easy-going, laid-back variety	Supra-aural, closed-back, dynamic	R	75
Koss TD/60 £20	Good Average	Although they're devoid of channel identification and have a decidedly Stateside approach to sound, these are very listenable phones for the price	Supra-aural, closed-back, dynamic		75
Koss K/6X Plus £30	Fair Poor	'Sixties-style' phones from the good ole US of A, their sonic style is unique and can make a system sound quite different	Supra-aural, closed-backed, dynamic		63
Pioneer SE-72 £30	Good+ Average-	Neat, nicely made personal stereo oriented phones along the lines of Sony V3s. Sound is on the veiled side, good for aggressive sources	Supra-aural, closed-back, dynamic		75
Quart Phone 30 £40	Good Fair	Whilst not as seductive as their PMB25 predecessor the 30s are reasonably neutral and do improve on some of the competition - though not stunning	Circumaural, semi-open, dynamic		63
Quart PMB 25II £40	Good Good	Despite a somewhat unconventional suspension system the 25s put in a convincing and enjoyable performance with warm, lively balance	Circumaural, open-back, dynamic	BB	55
Quart Phone 70 £70	Good Good	Competent performers that were hard to criticise but lacked the life and sparkle of which some of the competition are capable	Circumaural, closed-back, dynamic		63
Quart PMB 65 £70	Good Good	Quite revealing and neutral albeit with the usual closed back sound, this competes well with more established models	Circumaural, closed-back, dynamic	R	55
Quart PMB 85 £90	Fair Very Good	These more expensive Quarts bear a striking resemblance to the Jecklin Float models and use two drivers per ear. Sound is a bit bass heavy but not bad overall	Circumaural, open-backed, dynamic		63
Realistic Pro-X £25	Poor Average-	Robust, unanimously uncomfortable and heavily veiled in sonic terms - not a great success	Supra-aural, closed-back, dynamic		75
Ross RE2530 CD £20	Average Average	Rather an 'average' £20 phone that some found uncomfortable due to high pressure on the ears. Sonic balance is on the bright side	Supra-aural, closed-back, dynamic		75
Ross RE2560 CD £25	Good Average+	If you're not too fussy about quality of finish and don't have an elfin head then these British phones warrant attention. Sound could be smoother	Supra-aural, semi-open, dynamic		75
Ross RE-2760 £35	Poor Fair	Stylish white cans from the only British firm in the business. Unfortunately sound quality is not up to par in this price range	Supra-aural, closed-back, dynamic		63
Sennheiser HD30 £13.50	Good Poor	Built specifically for the personal stereo market these small and light Sennheisers have a slightly synthetic sound, but are an upgrade on the average Walkphones	Supra-aural, semi-open back, dynamic		55
Sennheiser HD40 £18	Very Good Good-	Very light and comfortable headphones with an even sonic balance that will suit most sources, but jack is 6.3mm and not suited to personals	Supra-aural, semi-open, dynamic	BB	75
Sennheiser HD450 £27	Good Fair	Modern, simple and lightweight phones that are remarkably robust and which turned in a relaxed if weighty performance that was at worst pleasant	Supra-aural, semi-open, dynamic	R	63
Sennheiser HD480 £37	Good Fair	Using the same shell as the 450s, the 480s were a little softened and unrevealing by comparison with their competitors	Supra-aural, semi-open, dynamic		63
Sennheiser HD420SL £47	Good Good	The 420s gave a full and tangible quality to instruments and voices; whilst not the most revealing headphones around they would suit slightly brash sources	Supra-aural, open-back, dynamic		55
Sennheiser HD520 £60	Good+ Good+	A very comfortable and musically capable headphone. If you've got this sort of bread to blow on cans, give 'em a blast	Circumaural, semi-open, dynamic	R	75
Sennheiser HD530 £70	Very Good Good+	One of the better dynamics in its group, the 530s create a sense of space that eludes most sub £100 cans, and they're dead comfy to boot	Circumaural, semi-open, dynamic	R	75
Sennheiser HD540 Ref Gold £160	Good Very Good	The 540 Golds prove that dynamic headphones can be subtle, informative and capable of creating a remarkable sense of space	Circumaural, open-back, dynamic	R	55
Sony A21L £20	Good- Good-	Forward facing in-ear drivers on a folding plastic band provide exceptional clarity for such an inexpensive phone. However, no bass, and fit isn't to everyone's taste.	Intra-aural, semi-open, dynamic	BB	75
Sony MDR V3 £30	Fair Good	Portable stereo oriented phones that are very nicely made and combine clarity with a pleasant lack of distortion	Supra-aural, closed-back, dynamic	BB	63
Sony MDR-V5 £50	Very Good Average+	A nicely made comfortable headphone let down by a limited ability to reproduce music in a natural fashion	Supra-aural, semi-open, dynamic		75
Sony MDR V7 £70	Very Good Very Good	Classy sounding cans that are very slick and work well with all types of music, setting the standard in their price range	Circumaural, closed-back, dynamic	R	63
Sony MDR-CD999 £120	Good+ Very Good	A very nice headphone in all respects, the 999s are worthy of the best headphone outputs and high quality sources	Supra-aural, semi-open, dynamic	R	75
Sony MDR-R10 £2500	Excellent Very Good+	Costly state of the art sealed moving coil design built to the highest standards using the finest materials. Sound quality reflects this care, being big, clear, sweet and refined	Circumaural, closed-back, dynamic	R	72
Stax SR34 £140	Fair Very Good	The least expensive Stax headphones around, the SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural, open-back, electret		55
Stax SR84 £210	Very Good Very Good	The stepping stone between dynamics and full electrostatics, these electret phones are revealing, open and highly enjoyable	Supra-aural, open-backed, electret	R	63
Stax Gamma pro/SRD-X pro £296/£230	Very Good Excellent	The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural, open-backed, electrostatic	R	63
Stax SR Gamma £299 (inc. SRD-6 Adaptor at £100)	Very Good Very Good	The next model down the Stax range from the Lambda, the Gamma is an excellent headphone with little to criticise but the price.	Circumaural, open-back, electrostatic	R	55
Stax SR Lambda Pro £545 (inc. SRD-7SB Mk 2 Adaptor at £185)	Very Good Very Good	A bit of an industry reference the Pros are frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural, open-back, electrostatic	R	55

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# THE DIRECTORY

## HEADPHONES

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Stax SR Lambda Pro £360/ SRM-1 energiser £635	Very Good Excellent	This combination extracts layers of information that other headphones only hint at. The SRM-1 has more edge than the SRM-T1, but it's good	Circumaural, open-back, electrostatic	R	75
Stax Lambda Signature/SRM-T1 £470/£895	Very Good Excellent	The Signature when combined with the SRM-T1 valve driver must be the most transparent headphone available	Circumaural, open-backed, electrostatic	R	72
Yamaha YHL-006 £30	Average Average	Unusual personal stereo oriented phones that curl up when not in use. Earphones are like golf balls and balance is well suited to Walkmans	Supra-aural, open-back, dynamic		75

## PERSONAL STEREO

Whilst not exactly hi-fi components, personal stereos probably play more music to more ears than all manner of domestic systems and as such demand some attention. Now that personal CD players have joined the ubiquitous Walkman in the market, the variety and standard of sound quality is huge, with obscurely named cassette players practically falling out of your cornflakes packet and Discmen going for £300.

Despite their diminutive size personals attempt to incorporate as many gimmicks and features as

possible, cassette players often incorporating tuners, graphic equalisers and Dolby noise reduction. CD players are still relatively expensive and don't tend to vary that much on the features front, rather the amount and quality of accessories differs. Most models come with a mains adaptor and some include remote control.

Sound quality on the cassette front seems to have a proportional relationship to price and integrity of construction – wow and flutter being quite obvious on the cheaper models. CD players

become less noisy as they get dearer and also reduce in size; one drawback of the latter seems to be that immunity to shock suffers as a consequence. Cassette players do, on the whole, seem better suited to the outdoor life than their digital counterparts, as does the software. Bear in mind that the sound and lab ratings given below cannot realistically be compared to those in other categories or between cassette and CD personals.

## PERSONAL CASSETTES

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa HS-PL300 £110	N/A Average	Good looking, simply laid out player with a sensible selection of features and reasonable sound quality for a small player of this price	Dolby NR, chrome/metal eq, remote		This
Aiwa HS-PX303 £150	N/A Good	Chunky and macho styling combines with comprehensive features and a half decent transport to make a powerful personal	Dolby B & C, chrome/metal eq, remote	R	This
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		This
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	This
Philips D6658 £30	Very Poor Poor	The low price limits sound quality, and this is not a spectacular machine, but it does a reasonable none the less	Graphic EQ, AM/FM		56
Saisho PS90R £40	Poor Poor	A bit of a jumble of features and gadgets, the PS90R has on-board speakers, an extending aerial and even records, but sound quality is dubious	Graphic EQ, types I, II & IV, AM/FM, recorder		56
Sharp JC-270E £130	N/A Average-	Slightly old fashioned design combines with a basic feature count and mediocre sound quality to make an apparently uncompetitive player	Dolby, chrome/metal eq, remote		This
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	This
Sony WM-701C £150	N/A Good-	Beautiful little machine with all the necessary buttons'n'switches and a fundamentally exceptional sound quality, marred unfortunately by wow and flutter	Dolby B & C, chrome/metal eq, remote, folding phones		This
Sony Walkman Pro £249-£289	Good+ Very Good	One of the finest sounding cassette decks on the market today. A mandatory Best Buy, it takes other personals to the cleaners (except on weight and power consumption)	Dolby B, C, types I, II & IV, record, line BB in/out, varispeed		52/56
Toshiba KT-4549 £80	N/A Poor	Fully equipped with 10 preset radio and alarm clock the KT-4549 is a bit aggressive on the sonic side and the bass boost system lacks balls	Dolby, chrome/metal eq, radio, alarm clock		This

## PERSONAL CDs

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Goodmans GCD-10 £120	Average- Poor	Cheap, flashy and not short on accessories the GCD-10 is a rather noisy player that left a lot to be desired on the sound quality front	13.5 x 3.7 x 18cm, 478g, mains adaptor		66
Kenwood DPC-77 £270	Good+ Very Good	Very chunky and well made, the DPC-77 is the only player to include a digital output and sounds very good through its analogue output – a suitable domestic alternative	12.8 x 3.5 x 14.5cm, 750g, digital output, mains & in-car adaptors	R	66
Philips D6800 £130	Average Average-	A competitively priced and reasonably attractive looking player whose sonic performance is somewhat marred by a rather grainy top end	13 x 4 x 17.5cm, 516g, 3" ready, twin hdph sockets		66
Sanyo CP-12 £260	Fair Good+	Sonically amongst the more enjoyable personal CD players and capable of revealing the musical aspects of a disc in an interesting and entertaining fashion	12.5 x 2 x 12.7cm, 380g, wired remote, mains adaptor	R	66
Sony D-20 £150	Average+ Fair	Not bad for a machine at this price, it's nicely designed and reasonably robust, with reasonable sound quality	13.8 x 3.8 x 15cm, 450g, mains adaptor	R	66
Sony D-88 £300	Average- Fair+	A stylish and 'cultish' object, the D-88 is very small and has an adjustable disc drive for three and five inch discs. Sound quality doesn't quite match appearance	9.4 x 3 x 9.8cm, 300g, 3" ready, mains adaptor, no line out		66
Sony D-150 £300	Fair+ Very Good	One of the most enjoyable machines encountered, sounding informative and sweet and looking very tasty to boot. Comes complete with a tough carrying case	12.6 x 2.1 x 13.5cm, 420g, 3" ready, R mains adaptor	R	66
Xenon CDP-03 £180	Average- Fair+	A well made and competitively priced machine that is ergonomically spoilt by flat slightly unresponsive buttons. Sound quality ain't too bad but a trifle boring	12.6 x 2.7 x 12.6cm, 560g, high frequency filter, key lock		66

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## CD PORTABLES

CD Portables or Yuppie Blasters as we classified them are basically portable stereos gone digital, ie a compact disc player is included alongside the usual AM/FM radio and single or double cassette deck. Compact disc is a novelty that seems to add a fairly hefty premium onto the price of the standard ghetto blaster, but the improved sound quality over standard cassettes may justify this for some. In virtually every case a CD output socket is

fitted which means that it's possible to play silver discs through a domestic amplifier and loudspeakers, thus they are some sort of substitute for standalone mains machines (as are the personal CD players). One drawback with having a CD player on board is that batteries are gobbled up even quicker than usual, up to ten batteries being required in some cases. Neither are the units particularly light, the heaviest weighing eight kilos!

However they do all run off the mains too, and come with an appropriate lead for this purpose. Other useful features common to most are spare input sockets to record from an external line source such as a preamplified-vinyl disc signal, and microphone sockets for recording live events (although the usual lack of record level adjustment is a nuisance).

MODEL PRICE	SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa CSD-XL25 £150	Poor	It's cheap, cheerful and not too low on features but sound quality from disc is frankly uninspiring	Twin headphone sockets		73
Bose Acoustic Wave £750	Very Good	Not exactly a CD portable as it doesn't play discs, but a highly versatile and stylish radio cassette player that has bass	Input sockets, Dolby NR, PA capable etc	R	73
Grundig RR9000CD £300	Average	Relatively slick machine with full CD function and volume remote control, low on features for price and unspectacular sounding	Remote, motorised volume pot, condenser mic		73
Philips AZ8394 £200	Average-	Stylish in a wasp like fashion, unfortunately the disc playing lets it down somewhat but otherwise it's OK	Twin decks, graphic eq., bass boost, condenser mic		73
Sharp QT-CD43 £280	Average	Quite a beefy box that comes complete with remote control for volume and CD functions. It even has a surround sound option which enhances imaging	Clock, speaker outputs, powered volume pot		73
Sony CFD-D73 £280	Good	The model we received was intended for the Japanese market and thus may not be entirely representative but it made reasonable sounds and has novel features	UHF bandwidth, input sockets, graphic eq., Megabass	R	73
Sony CFD-DW83 £300	Average	A macho looking beast capable of highish levels, but unimpressive sound for the price. Nice styling and good for scratching	Clock, timer, balance, input sockets, graphic eq.		73
Toshiba RT-8089 £200	Poor+	Square and long but rather drab on the sound quality front, as well equipped as most but rather tinny in many respects	Clock, twin decks		73
Toshiba XR-9458 £250	Average+	Accompanied by a plethora of accessories including a meaty plinth and infra red remote the Toshiba didn't quite make it on the sound quality front but is worth considering	420g, 2 remotes, mains adaptor, 3" ready etc.		73

## STANDS AND SUPPORTS

It's becoming more and more apparent that all the components in a hi-fi system benefit from being placed on the right kind of support. It is already acknowledged that performance of electro-mechanical transducers, such as turntables and loudspeakers, can be greatly improved by using highly rigid supports. This notion has been expanded to include electronics such as amplifiers and compact disc players, and inevitably a broad range of stands and supports have been produced to cater for this requirement.

With loudspeaker stands there seems to be two

broad schools of design. The most common is the open frame type which uses square section steel tubing (usually less than an inch square) made up to form a tripod or quadropod stand usually fitted with spikes top and bottom to ensure good coupling to both floor and cabinet. However, for reasons of domestic harmony this latter option is often not pursued as eagerly as perhaps it should be. The alternative approach is to use mass. Larger section (approximately 3 inch x 2 inch) tubing is welded between square top and bottom plates and filled with sand and/or lead shot. Again, this type uses

spikes at the base but Blu-tack or the like for coupling with the speaker cabinet.

Equipment supports generally place isolation quite high on the list of priorities and usually use a lightweight steel frame to support an MDF platform. Once again spikes are used to minimise contact with the platform and ensure good coupling to the floor. Minimising weight without compromising rigidity seems to be the aim with turntable supports but those designed for electronics often employ some form of damping to kill vibration, sometimes in the form of mass.

## LOUDSPEAKER STANDS

MODEL PRICE	TYPE FINISH	COMMENTS	TOP PLATE SIZE HEIGHT	VALUE	BACK ISSUE FULL REVIEW
Appolo A820 £40	4 leg Fair	A light open-framed budget design slightly lacking in rigidity and subjectively superceded by other stands costing £10 more.	19 x 19cm 53cm		58
Appolo A10 £47.25	4 leg Fair	A robust and lightweight model, it would make an ideal upgrade for those still happy with the big boxes of old.	19 x 19cm 44cm	R	58
Foundation Fred £65	2 leg Average	With sand filling the Freds made speakers sound tight and coherent with a more even balance.	19 x 19cm 36/43/59cm		58
Foundation Maggi £159	Pair Very Good	Made for Magneplanar and other similar panel speakers they seem to have a healthy effect on the sound quality thereof.	50 x 2cm 2cm	R	58
Foundation Pi £250	2 leg Very Good	Overpriced in material terms the Pi nevertheless has a very positive effect on the low frequency performance of conventional speakers.	20 x 20cm 25/38/46/53cm	R	58
Heybrook Point 5 £50	3 leg Very Good	An unusual triangulated open frame stand that can help certain speakers sound more transparent and fluent - a good value stand	23 x 21.5cm 47cm	BB	58
Heybrook HBS1 £75	4 leg Very Good	With its new aluminium base frame the HBS1 fared very well in the listening tests. It allowed much of the speakers own 'sound' to remain intact.	23 x 21cm 47cm	R	58
Linn Kan-II £79	4 leg Very Good	Built to support Linn's Kan speaker this stand is well suited to the task, but is less successful with other loudspeakers.	19 x 16cm 59cm		58
Linn Sara £85	4 leg Very Good	The Sara exhibits some odd properties so its use other than with the Sara loudspeaker should be viewed with caution.	25 x 21cm 53cm		58
Monotrak Engineering M1 £58	1 leg Good	The M1 gave the mid and treble a commendably smooth and detailed presentation but bass sounded rather lacklustre and muddly.	19 x 18.5cm 48cm		58
Monotrak Engineering M4 £58	4 leg Very Good	Begging comparison with Heybrook's HBS1 the M4 maintained much of the openness and forthright detail of that model.	23 x 21.5cm 53cm	R	58
Monotrak Engineering M4S £58	4 leg Very Good	Its stature and stability would seem to mark it out as most suitable for smaller, lighter cabinets. The M4S possessed an open midband and clear treble.	20 x 17.5cm 53cm		58
Mordaunt-Short IS1 II £45	3 leg Good	Suited to low mass speakers, preferably using spikes to effect coupling, they sounded slightly 'jazzed up' but the overall sound was quite unuddled.	18 x 15cm 56cm	R	58
Origin Live £117	3 leg Good	An unusual tripod stand devoid of top plate and taking up more floor space than normal, subjective and technical performance was exemplary.	(support area) 22 x 17.5cm 52cm	R	58
Partington PP4 £50	1 leg Good	The PP4 offers a rather mixed performance, though when damped with sand infill it was less ready to embellish the overall sound and low frequencies became tauter and quicker.	18 x 16.5cm 48cm		58
Partington Dreadnought II £120 (filled)	1 leg Very Good	Ideal for systems on the light/bright side of neutral, the Dreadnought IIs nevertheless still need some careful re-examination by Partington.	17.5 x 16.5cm 63cm		58

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## LOUDSPEAKER STANDS

MODEL PRICE	TYPE FINISH	COMMENTS	TOP PLATE SIZE HEIGHT	VALUE	BACK ISSUE FULL REVIEW
QED TS22 Tristand £50	3 leg Very Good	Most tracks sounded uplifted or buoyant, never thick nor coloured. It worked well with most of the speakers tried and encouraged a fluid and revealing midband.	19 x 17cm 45/50/58cm	BB	58
RATA Torlyte £190	2 panel Excellent	Suited to low mass speakers, these unusual stands are hardly discreet but offer transparent and clean sound – much like the Torlyte table!	25 x 21cm 48cm	R	58
Target HS20 £53	1 leg Excellent	This monopod stand can be used either filled or unfilled and encourages different characteristics in the sound accordingly.	19 x 16.5cm 53cm		58
Target HJ15/3 £83	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

## EQUIPMENT SUPPORTS

MODEL PRICE	TYPE FINISH	COMMENTS	SIZE (H x W x D)	VALUE	BACK ISSUE FULL REVIEW
Audioquest Sorbothane Feet £10 each	Feet Good	These large gumdrops are very useful for damping vibrations in amplifiers and especially CD players.	6.5 x 2.5cm (circular)	R	57
Cornflake TCS5 £50	Table Very Good	A little too close to the ground for comfort, perhaps, but this novel and stylish little table is certainly worth seeking out.	29 x 43 x 33cm	R	57
Cornflake TCS6 £50	Shelf Good	A squat and rigid frame supports a Medite top board with four adjustable spikes, better suited to suspended sub-chassis turntables.	43 x 23 x 33cm		57
Deltec Isolation Base £135	Platform Good	Designed for all CD players, amplifiers and separates, but not suspended sub-chassis turntables, the isolation is second to none.	50.5 x 40cm	R	57
RATA Model A £125	Table Very Good	A three-legged Torlyte turntable support that has become something of an industry reference.	46 x 46.5 x 38.5cm	R	57
RATA Amplat £40.25	Platform Very Good	A lightweight and rigid Torlyte slat with spikes for floor or shelf mounting, it works well in conjunction with the Target TT2.	4 x 44.5 x 35cm		57
Sound Organisation Table £55	Table Very Good	A deceptively simple structure that just happens to be engineered in a thoughtful, and ultimately successful manner.	37 x 45 x 35cm	BB	57
Sound Organisation Wall Stand £40	Shelf Very Good	The first of its ilk and still amongst the best, this simple framework represents a vast improvement over standard furniture shelves.	27.5 x 43 x 35cm	BB	57
Target TT1 £46.50	Shelf Excellent	This rigidly braced shelf offers both good sound quality and material value for money.	26 x 46.5 x 35.5cm	BB	57
Target TT2 £47.50	Table Very Good	Standing up to the best in most areas, the TT2's only real foible concerns a slight loss of bass 'slam'.	52 x 46.5 x 35.5cm	BB	57
Townshend Suspension Base £145	Platform Fair	Designed to complement the Rock turntable, this platform will bring subjective improvement to a wide range of electronics.	43 x 36cm	R	57

## CABLES AND CONNECTIONS

Although cables and connections are sometimes thought to be the least important items in an audio system there has been a growing awareness in recent years that they have a significant effect on sound quality. To this end there is now a vast array of exotic cables and interconnects available to those interested in experimentation. The key observation on cables is that they are much more than mere accessories. Carrying the audio signal, just as any amplifier does, it's really not too surprising that they can influence the quality of that

signal. The characteristics of any cable are determined by the materials and topologies utilised in its construction. The purity of the conductor, nature of the insulator dielectric, mechanical construction, physical geometry, RF characteristics, efficiency of screening and finally the connectors themselves, all play vital roles in the sonic character. These factors tend to vary more with interconnect cables which are used to carry the signal between active components like pre and power amplifiers. The

interconnects summarised here were tested in 1m terminated lengths and therefore the results and prices relate to that length – some cables may well perform differently when used in longer lengths.

The features column contains information on the material make-up of the different cables with the following abbreviations: OFC – oxygen free copper, OFHC – oxygen free high conductivity (Audioion define the HC as high crystal), PC-OCC – pure copper by ohno continuous casting, LC-OFC – linear crystal oxygen free copper.

## INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Apature LSD N/A in UK	Poor Fair	Faint resonant boom was audible at very low frequencies, but otherwise this cable sounded remarkably neutral.	Silver plated copper, PTFE dielectric		59
Audioquest Livewire Topaz £35	Good Fair	Sounding 'bigger' and faintly richer than Reference 2, Topaz was also slightly grainy at the top end.	Gold-plated plugs, OFHC copper		59
Audioquest Livewire Ruby £49	Fair Good	Smoother sounding than the Topaz, the extended crystal Ruby is less grainy and coarse, better able to resolve complex passages.	FCL copper twin axial	R	59
Audioquest Livewire Quartz £75	Good Good	Quartz has an ideal, neutral balance that embodies sparkling clarity without the drawbacks of harshness or compression.	3 piece plugs, PTFE dielectric	R	59
Audio Technica AT6115 £50	Very Good Fair	This cable sounds somewhat 'quieter' than the original LC-OFC interconnect, but is also less transparent and three dimensional.	PC-OCC copper coaxial		59
Audionote Copper ANC £35	Fair Good	ANC sounded punchy with a faintly lean but tightly-focused bass character. This crystalline precision waned slightly at higher frequencies.	OFHC copper twin-axial	R	59
Audionote Flexible Silver ANS £85	Fair Very Good	ANS scored a hit with its transparent midband and revealing but quite unforced treble quality. Bass transients were slightly softened.	Silver signal & Copper screen	R	59
Audionote Silver ANV £140	Poor Very Good	Far weightier-sounding than the flexible ANS, ANV interconnect also possesses a fair degree of treble clarity and sparkle.	21 strand silver Litz		59
Aural Symphonics N/A in UK	Poor Good	This cable enjoyed an open and transparent midband and sounded remarkably neutral and faithful to the source.	OF copper PTFE dielectric	R	59
Budget Patch Cords see text	Fair Poor	As thrown in gratis with cassette decks and the like – frequency extremes were restricted and performances were veiled.	Thin coaxial		59
Budget OFC circa £7	Fair Fair	Subjectively, this cable did lift much of the aural fog experienced with scrawny standard hook-up leads.	OFC		59
Deltec Slink £32	Good Very Good	Ideally used in lengths of under 4 metres, it errs on the lean side of neutral but has an uncommon transparency in the midrange.	4 silver plated OFC strands PTFE dielectric	BB	59
Deltec Black Slink £152	Excellent Excellent	Inherently neutral the cable faithfully reproduced broad and deep stereo soundstages with precise focus and a sense of facility.	8 silver plated OFC strands PTFE dielectric	R	59

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## INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Denon LC-0FC N/A separately	Very Good Fair	Supplied with Denon's dearer CD players this cable introduced a peculiar 'twangy' coloration at high frequencies, and a slightly soft bass.	LC-0FC, non-magnetic gold plated plugs		59
DNM Solid-core £15-£25	Fair Good	Transparent in the midband and full of sparkling detail in the treble, low bass was slightly curtailed (unterminated price £2.30 per m.)	Single strand nickel-plated copper. Unshielded	R	59
Kimber Kable PSB £32	Very Good Very Good	An exceedingly transparent midband but slightly 'clanky' treble. It always managed to sound remarkably uncluttered and open.	OFC, PTFE dielectric	BB	59
Kimber Kable KC-1 £47	Very Good Fair	Tonally faintly leaner and brighter than the more open-weave PSB, KC-1's treble detail was just too sharp and grainy.	Multi-gauge PTFE dielectric		59
Kimber Kable KC-AG £375	Good Very Good	Treble detail resolution was perceived in a slightly abrupt if wholly controlled fashion. Depth re-creation and lateral separation were excellent.	Multi-gauge silver, PTFE dielectric	R	59
MDM Interconnect £14.95	Good Fair	The subjective performance of MDM did appear a little imprecise at the frequency extremes, but a worthwhile upgrade on budget interconnect.	Coaxial, solid core, gold plated plugs		59
MIT PC-Squared £75	Fair Good	This multi-gauge cable produced a very open and buoyant midband but sounded slightly 'peculiar' at frequency extremes.	OFC, multi-gauge	R	59
MIT Spectral MI330 £193	Poor Fair	MI330 displays a marvellously open and enticing midband quality, bass is warm and rich but this character has a tendency to dominate.	Multi-gauge balanced bandwidth		59
Monitor PC 0100381 £17	Good Fair	There is more than a hint of instrumental muddling and bass is slightly soft, however, the slightly 'shut-in' sound is par for the course at the price.	OFC, coaxial	R	59
Monster Interlink 400 £30	Good Good	Bass is solid and punchy, counterpointed by a slightly overblown midband which tends to make vocalists sound larger-than-life.	Multi-gauge	R	59
Monster Interlink CD £44	Fair Fair	Low frequency is commendably weighty, but the top-end sounds vague and lacking in image focus. Suited to some systems better than others.	Multi-gauge		59
Monster Interlink Reference £88	Good Fair	Protracted listening indicated a lack of dynamic speed – a subjective sluggishness. It may prove well suited to up-front systems.	Multi-gauge Balanced bandwidth Gold plated plugs		59
Myst Tm £15.60	Fair Good	Fairly neutral with a pleasantly open and transparent midband. Some deep bass detail is lost but treble is sharply focused.	Solid-silver PTFE dielectric	BB	59
Origin Live Soli-Core Super £60	Good Fair	Improves over previous Soli-core samples in stereo depth and bass weight, but a 'loud' treble presentation remains.	Solid-core gold-plated AT plugs		59
QED Incon P1-Gold £14.95	Good Good	A lively open presentation that just borders on the lean side of neutral, the quick and lucid delivery affording considerable musical insight.	OFHC, gold plated Deltron plugs	BB	59
QED Incon Graphite GP1 Gold £18.95	Fair Fair	A shielded version of Incon P1, it sounded thicker at the frequency extremes, the top end being coarser and more out of focus. Good for long runs though.	OFHC Graphite shielding	R	59
Sony RK-C310ES £40	Excellent Good	Possessing deep firm bass and a sparkling top end it offers a balanced perspective with negligible coloration	Coaxial LC-0FC	R	59
Sterling £250	Fair Good	Possessing a neutral if faintly rich overall balance it supplies a pleasantly open and transparent perspective. (Reviewed in pre-production form.)	2 silver strands per conductor		59
Thorens SAC 100 £50	Good Fair	Performance is undermined by a slightly coarse and splashy treble, not necessarily bright, simply rather confused – and fine detail lacks resolution.	Silver-plated OFC, coaxial		59
Van den Hul MC-D300II £59	Poor Good	It tended to highlight some upper mid detail, but a generally open and spacious acoustic proved its saving grace. Slightly soft at LF.	Silver plated single strand VdH plugs	R	59
Van den Hul MC-1021II £69	Good Good	Possessing the same endearing qualities as the D300 it presented open and transparent soundstages and improved timbral resolution	Twin axial silver plated copper	R	59
Van den Hul MC-D502 £77	Fair Fair	The tonal balance was 'tilted' by a strong and authoritative bass line, which had the knock-on effect of muting treble detail. A bit dear.	Twin axial silver plated copper, teflon dielectric		59
Van den Hul Thunderline £147	Good Fair	Thunderline essentially parallels the sonic performance of the cheaper D102. HF is occasionally tainted by a 'tizzy' coarseness, bass is tight and firm.	Silver plated 'matched copper'		59
Van den Hul MC-Gold £247	Fair Good	It possesses a rich and beguiling treble balance that matches a weighty, slightly warm bass character. Seductive balance may prove worthwhile in some circumstances.	Silver & gold plated copper		59
Van den Hul MC-Silver £747	Good Good	Although remarkably transparent for an asymmetric design this costly cable was not considered to be of 'state-of-the-art' standard, and is bettered by cheaper models.	19 silver plated copper strands		59
Vecteur 8045 £49	Very Good Good	Sounding solid and forthright it might seem slightly cold in some systems but the treble 'edge' is mercifully clean. Very low frequencies were a little lacking in 'slam'.	LC-0FC signal & screen	R	59

## LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Absolute Wire Force 4 £4.50 per metre	Good Fair+	By current standards there was a loss of fine, sharp detail at the frequency extremes, but it has a big and friendly sound	744 OFC strands, PVC dielectric		64
Audionote DR-200 £16 per metre	Fair+	Open and detailed throughout the midband but a grainy coloration tended to corrupt subtle timbral information at very high frequencies	200 LC strands, polyurethane and cotton dielectric		64
Audionote AN-SP £100 per metre	Average – Very Good	A clean and open sounding cable that offered a deep and pleasantly detailed perspective. Bass was slightly restricted, but seemed tight and coherent nonetheless	15 silver strands, polyethylene dielectric		64
Audioquest Livewire Black £15 per metre	Good Good	It proved clear and punchy but with some grain across the treble. Nevertheless Black remains an interesting concept and proved better than Livewire Green	OFHC, surface only – foam core construction	R	64
Audio Technica AT6120 £95 – 10m	Fair+	Compared to earlier LC-0FC cables this PC-OCC derivative sounded smoother and less aggressive	PC-OCC, PVC dielectric		64
Bellwire 12p per metre	Poor Average –	Broadly speaking it delivered a bright and tizzy sounding treble with a fairly open and detailed mid with little or no bass resolution	0.5mm single strand, PVC dielectric		64
Deltec 8S £144 – 5m pair	Good Good+	The unerring transparency and detail resolution of 8S throughout the midband makes it a far cleaner and more spacious sounding cable than others at the price	4 silver plated OF copper strands, PTFE	R	64
Deltec Black Sixteen £456 – 4.5m pair	Very Good Excellent	Bass was deep and rhythmically secure, the mid tonally pure and free of additional sibilance while the treble was both relaxed, sweet and highly detailed	16 silver plated OF copper strands, PTFE dielectric	R	64
DNM Solid core £2.30 per metre	Average Fair	A good general-purpose solid-core, though too bandwidth limited for high-end applications. Sounds great in some systems	0.65mm single strand, webbed PVC dielectric	R	64
Exposure £2 per metre	Good Good	It could sound a trifle matter of fact but this emotive flattening was also somewhat dependent on the music program. It is also highly suited to long runs	56 OFC strands, webbed PVC dielectric	R	64
Kimber Kable 4PR £49.45 – 5m pair	Fair Fair+	This directionally marked cable benefitted from an open and airy treble quality but seemed notably leaner than 4TC. Bass was well round and satisfyingly taut	4 x 7 copper strands per conductor, PVC dielectric		64

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

# THE DIRECTORY

## LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>Kimber Kable 4TC</b> £16 per metre	Good Good+	4TC made a great impression in the listening tests with an open midband, a smooth and unfatiguing treble with slightly rich but suitably weighty bass	OF copper, PTFE dielectric	R	64
<b>Linn K20</b> £2.20 per metre	Good Fair	Subjectively it erred on the forward and bright side of neutral but enjoyed an essentially clear and punchy delivery	56 OFC strands, webbed PVC dielectric		64
<b>Marantz ML-55S</b> £24.90 - 10m	Fair Fair	Subjectively this cable offered a loose and splashy treble which, though not overtly bright, did compromise both tonal and timbral accuracy	30 OFC strands, 3 conductors PVC dielectric		64
<b>Mission Cyrus</b> £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
<b>Monitor PC Silverline PC4</b> £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
<b>Monster Superflex</b> £2.50 per metre	Fair+ Fair+	Treble detail was both reserved and confused though there was little in the way of harshness and grain. Deep bass notes were also found to be lacking	OFC, multistrand, Duraflex dielectric		64
<b>Monster Original</b> £4 per metre	Good Fair+	Original sounded relatively congested and murky at higher frequencies but possessed weight and conviction in the bass	Multistrand		64
<b>Monster Powerline 2</b> £12 per metre	Good Good-	Powerline stamped its own hallmark on the sound with a strong taut bass and an essentially clear midband giving tactile stereo images	Multistrand, helical construction		64
<b>Musical Fidelity Lifeline</b> £11.50 per metre	Fair Good-	Lifeline did demonstrate a strong directional inclination, affording a laid back but fairly neutral balance when correctly oriented	4 x 0.8mm PC-OCC strands	R	64
<b>Naim NAC-A4</b> £2.25 per metre	Good Fair+	Tinged with brightness while the deep bass response seemed both over heavy and poorly integrated compared to the immediate competition	Multistrand, webbed PVC dielectric		64
<b>NVA</b> £6 per metre	Average+ Good	A light and breezy sounding cable best suited to short lengths, NVA benefitted from a clear and transparent outlook	7 x 0.25mm silver alloy strands, PTFE	R	64
<b>Origin Live Soli-Core Ordinary</b> £1.80 per metre	Good Fair+	Subjectively it bettered the performance of the costlier Super version, affording a pleasantly detailed and spacious soundstage with firm bass but slightly coarse treble	1.8mm and 0.5mm single strands	R	64
<b>QED 79-Strand</b> 90p per metre	Good Fair	For much of the last decade QED 79-Strand has been the first port of call for enthusiasts on the upgrading ladder, a tradition that should still hold true today	79 strand, PVC dielectric	R	64
<b>QED Incon Graphite</b> £1.75 per metre	Fair+ Fair+	This graphite version of Incon sounded cruder and generally more heavy handed than the cheaper unshielded type. Overall presentation was mildly restricted and cloaked in a faint aural haze	OFHC, polymeric screen		64
<b>QED Flat 200</b> £1.95 per metre	Good Good	I detected a degree of confusion at low frequencies but this did not stifle the acoustic atmosphere which remained open and positive	200 strands, flat webbed PVC dielectric	R	64
<b>Rotel Supra 4</b> £2.49 per metre	Good+ Good	Ideal for both long and short runs, it furnishes a big sound that benefits further from a smooth, unfatiguing treble	1,036 OFC strands, webbed PVC dielectric	R	64
<b>Rotel Supra 10</b> £6.49 per metre	Good+ Good	Supra 10 provided a very free and open sound that was unhindered by any excess at low frequencies. Worth its weight in scrap copper!	2,562 OFC strands, webbed PVC dielectric	R	64
<b>Sony RK-S5ES</b> £59.95 - 5m	Fair+ Fair+	The sound of this cable was also somewhat controlled and over damped. The treble was relatively free and airy but lower octaves, including the midband, were constrained	350 x 0.08mm OFC strands, heat shrink dielectric		64
<b>Solid core mains cable</b> 36p per metre	Fair+ Good	It enjoys much of the smooth treble and articulate midrange usually associated with the better solid core derivatives. Lean but taut and rhythmically coherent	1.5mm square, 3 cores, PVC dielectric	BB	64
<b>Sterling</b> £499 - 5m pair	Fair Fair	This pre-production sample possessed a strangely muddled and reserved sound quality. It suffered from a progressive instrument modulation that totally confused more complex orchestral passages	Pure Silver, PTFE dielectric		64
<b>Townshend Isolda</b> £400 - 5m pair	Fair+ Good	Isolda possessed a truly dark background out of which rose a very solid and extended bass together with an excellent sense of transparency through the upper octaves	8 coax cables per conductor - very thick	R	64
<b>van den Hul CS-122</b> £5.50 per metre	Fair+ Good-	Characterised by a driving and powerful bass, CS-122 proved to be a heavy sounding cable. Mid treble detail was refreshingly clear but there was a slightly muted air about the extreme treble	19 x 0.45mm silver plated strands, webbed rubberised dielectric	R	64
<b>van den Hul CS-352</b> £12.95 per metre	Good Fair+	Subjectively it sounded like CS-122 only more so, the deep rumbling bass tending to overwhelm subtle musical details. It also appeared a trifle peaky in the treble	7 x 0.76mm + 168 x 0.125mm silver plated strands, rubberised dielectric		64
<b>van den Hul SCS-12</b> £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
<b>van den Hul SCS-2</b> £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
<b>Vecteur R-CV30</b> £4.99 per metre	Fair Good	Subjectively the better of Vecteur's three-strong cable line-up offering a neutral overall perspective but with a slight loss of detail resolution at both frequency extremes	4 x 0.8mm LC-OFC PTFE insulated strands	BB	64
<b>Vecteur S-CV90</b> £199 - 5m pair	Fair+ Fair+	It seemed both less transparent and integrated throughout the midband than R-CV30, though both frequency extremes were spruced up with a tighter sharper delivery	6 x 0.7mm LC-OFC strands		64

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**HI-FI CHOICE**

# THE DIRECTORY

## IN-CAR ENTERTAINMENT

In-car entertainment is an area not usually associated with the esoteric world of domestic hi-fi. However, it represents a source of musical entertainment that many of us are exposed to every day. The majority of new cars are fitted with some form of radio before they leave the showroom and in many cases this usually very basic player is taken for granted and accepted as representative of in-car standards.

For the price of a budget amplifier or more, there is a wide variety of in-car machines to choose from,

including cassette, CD and even DAT players. The majority of sub £300 players are integrated units featuring a cassette player, AM/FM tuner and amplifier, all in one remarkably compact standard sized box. At this price level the cassette players tend to be fairly basic affairs, although autoreverse and noise reduction systems are both fairly common. Tuners are usually of the digital variety with varying degrees of sophistication in signal tuning and presetting, with some machines featuring as many as 18 FM presets. The emphasis is on the frequency

modulated band and AM often suffers as a consequence, but fortunately for radio enthusiasts there are some exceptions.

The amplifier is usually designed to drive two pairs of speakers mounted fore and aft of the vehicle, and a fader is fitted to adjust the balance between the two. The dearer machines feature separate bass and treble controls which can be quite handy given the unusual acoustic of the car environment and the variety in balance and presentation to be had from car speakers.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Alpine 7282L £250	Good Very Good	A very attractive and seductive sounding player. The matt surfaced transparent preset keys are especially sexy	Bass/treble controls, 12 FM 6 AM presets, chrome eq., clock, 8W	R	61
Alpine 7905M/3539 £650/£350	Excellent Excellent	An easy to use and attractive CD/tuner, partnered with a powerful and flexible amplifier to give an effortless source of in-car entertainment	Bass/treble controls, 12 FM, 12 AM presets, slide-out, 150W	R	68
Blaupunkt Windsor SQR 38 £275	Good Average	Not very enthralling sonically, the Windsor is rather low powered but does have a reasonably stable tape transport	5 FM, 10 AM presets, 3.1W		62
Clarion 916HP £160	Good Average	With its rubbery buttons and touches of white this is a modest looking player let down by a weak cassette	Bass/treble controls, 5 FM, 5 AM presets, 9W		61
Clarion 946HP £250	Very Good Very Good	A good FM side let down slightly by AM performance. This Clarion is particularly nice to use with its nifty SAM tuning system	Bass/treble controls, 12 FM/6 AM presets. Slot-in, 15.1W	R	61
Clarion CDC7000/10028HA £650/£250	Very Good Excellent	Despite a slightly off-beat cartridge system the Clarion combo put in a performance that had the sonic edge over other CD/tuners in its test group	Bass/treble controls, 12 FM, 12 AM presets, security code, 80W	R	68
Goodmans GCE229 £150	Fair Average	If knobs, switches and legends are your bag then the GCE229 is the one for you - a lot of gizmos for the price and it even sounds OK	Bass/treble controls, 6 FM/6 AM presets. Chrome eq., clock, MSS, 10.1W	BB	61
Hitachi CSK-402E £250	Good Good	An attractively designed little player that for once doesn't disappoint when it comes to playing music, and it even has a security system	Bass/treble controls, 6 FM, 12 AM presets, Dolby, chrome eq., music search, 7.4W	R	62
Nakamichi TD-400E/PA-300 II £495/£329	Very Good Very Good	If you want your in-car entertainment to compete on sound quality grounds with your domestic system, this combo offers a very strong challenge	Bass/treble controls, 5 FM, 10 AM presets, uni-directional, chrome eq., Dolby B, C, 75W	R	62
Nakamichi TD-700E/PA-300II £874/£329	Very Good Excellent	For those who appreciate the wonders of analogue there are few in-car players to really compete with this superb cassette/radio. You can even adjust azimuth	Bass/treble controls, 6 FM, 6 AM presets, music search, Dolby, 75W	R	68
Panasonic CQ-497 £117	Fair Poor	The CQ-497 has a traditional style analogue tuning system making it easy to use. AM reception was good but the other sources are less encouraging	Bass/treble controls, chrome, NR, 7W		62
Philips DC680 £180	Average Good	A colourful and musically competent player that despite a gammy volume knob is well worth checking out.	8 FM, 4 AM presets 3.5W	R	61
Pioneer DEX-M300/CDX-M100/ GM-3000 £300/£450/£280	n/a Very Good	Separate control unit and boot mounted multi play autochanger make this a bit of a hefty installation but it uses the same magazines as their domestic players and sounds fine	Bass/treble controls, 18 FM, 6 AM presets, 80W, removable fascia		68
Proton 214CD/D275 £300/£175	Very Good Very Good	This Proton cassette/tuner offers good power and a level of fidelity appropriate to its price. Musically it has a Decca-like charm that is very appealing, plus a sensitive radio	Bass/treble controls, 8 FM, 8 AM presets, Dolby B/C NR, chrome eq., 85W	R	68
Sharp RG-F816E £200	Poor Average	Nothing if not novel the 816, with its unusual anti-theft system is custom built for the furry dice brigade, but is sonically a bit lacklustre	Four band graphic, 8 FM, 16 AM presets, ASP, Dolby, MSS, 10.9W		62
Sharp RG-F882E £220	Average Average	Again a glitzy full feature machine with a flip out control panel and plenty of lights. However, sound quality is a bit disappointing	Seven band graphic, 5 FM, 10 AM presets, ASP, chrome eq., Dolby, 8.5W		62

## RECEIVERS

Purists will look down their noses at the very idea of combining two functions into one box, and indeed they always have done. But unless we're talking about the exotic elite, the creme de la creme of amplifier and tunerdom, intrinsic technical shortcomings simply aren't an issue.

One obvious reason why you should buy a receiver if you were otherwise considering an amplifier and a tuner is that there are savings, ie of

size. Generally you end up with one box in place of two similarly sized boxes, which has got to be a good idea. Receivers are also simpler to operate, in principle anyway. At the very least you save on one power switch, and typically you are presented with an integrated control system that is bound to oil the wheels of ergonomics.

But there is one important point to watch. Because receivers don't sell in vast quantities in

this country, and because this is one of the very few countries to use Long Wave for public service broadcasting, many - no, most - receivers on sale in this country cover FM and MW only. Remember that LW is the home of Radio 4, where it can be heard on the all too frequent occasions it is not on FM.

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Harman Kardon HK330Vi £259	Average Average—	No LW, and FM section best suited to strong, local transmissions. The amplifier is quite powerful but favours the treble. Bass is tuneful but lacks weight	5 inputs (inc 2 tape), FM/MW tuner		70
Harman Kardon HK440Vxi £299	Good Good	Clear, dynamic, slightly bright sounding design, a little grainy in extremis. Mono switching and LW missing from tuner, which otherwise performs well	5 inputs (including 2 tape) with FM/MW tuner	R	70
JVC RX-777VL £500	Good Good	Sharp, lively but euphonious sound quality from line and phono source is matched to a high grade tuner. However, many half-baked facilities blunt value for money	A/V capable with 6 inputs, equaliser, digital ambience, FM, MW/LW		70
JVC RX-1001V £770	Average Poor	Power output is well below spec, and sound quality is cluttered and messy on all inputs	Digital ambience processing, Dolby Surround, 2/4 speaker, 40 FM/MW presets		70
Revox B285 £1782	Average Average—	Sophisticated and capable tuner is married to a muddled, compressed sounding amplifier, which also has low sensitivity preventing the amplifier being driven fully in many situations	70 watts/ch, 4 inputs (inc 2 tape), 29 FM/MW/LW presets		70
Rotel RX-850AL £230	Good Good	Well built and sensibly equipped receiver with outstanding sound quality for the price via the tuner, phono and line sources alike. It majors on subtlety however, and may not impress the heavy metal brigade	4 inputs (inc 1 tape), FM/MW/LW tuner	BB	70
SAE R102 £599	Average— Average	This is an uneven but mostly good performer. It sounds constrained but musical, but the tuner is weak on both wavebands.	4 inputs (inc 2 tape), FM/MW tuner		70

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# THE DIRECTORY

## VIDEO RECORDERS

For some time there's been a move to improve both the video and the audio quality of video recorders and TV sets alike as a necessary prelude to a proper integration between the two. Hi-fi video is obviously an important element in the story, and so is Dolby Stereo, the ambient 'surround sound'

system. The weak link of course is on the broadcast side. Although TV sound is well up to normal hi-fi standards, it has always been in mono and unjustly or otherwise has rarely attracted much audiophile interest. But TV sound is – or shortly will be – freed of the shackles of mono by the introduction of NICAM

stereo. NICAM – an acronym for Near Instantaneous Companding and Modulating – is the missing link that will help facilitate the much feted integration of video with audio. And then we have S-VHS, a system which does for picture quality what the other developments promise to do for the sound . . .

NAME PRICE	LAB SOUND & PICTURE	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai VS-75EK £550	Average Good	Excellent performance and a slick set of controls make this recorder a pleasure to use. Good price is a bonus	Hi-fi, NICAM, programmable remote	BB	71
Akai VS-77EK £700	Average Good	Another fine and carefully designed model from the impressive Akai video stable. The Dolby installation, whilst flawed, is certain to increase interest in the system	Hi-fi, NICAM, Dolby Surround decoder & stereo amp	R	71
Ferguson FV33H £500	Very Good Below Average	Beer budget NICAM has excellent tape search facilities and an intelligent remote control. Neither picture nor sound quality however are state of the art, and ergonomics are poor	Hi-fi, NICAM, transmitter LCD remote control		71
JVC HR-D750EK £500	Good Average+	Well sorted and relatively affordable NICAM recorder with LP sound only. It is pleasing to use and helpfully equipped, especially when trying to find individual recordings buried in long tapes. Performance is good in relation to price	Hi-fi, NICAM, transmitter LCD remote control	BB	71
JVC HR-S5000EK £1000	Good Very Good	This is the first domestic S-VHS recorder on the market, and it's an unusually well designed one with a wide range of well sorted features and controls. Sound and picture quality are close to state of the art, and miles ahead of any non-S-VHS recorder	S-VHS, Hi-fi, NICAM, LCD remote	R	71
Mitsubishi HS-B70 £1000	Very Good Very Good+	Superb model, and true state of the art picture quality, though you'll need a high grade S-VHS compatible monitor to reap full advantage. The facilities are also wide ranging and generally helpful	S-VHS, Hi-fi, NICAM, LP & SP, programmable remote	R	71
Nordmende V4405K £799	Good Good	Fine basic sound and picture quality, but the RF convertor introduced significant losses. An excellent model, but configured for German home market. VPS compatibility is of no practical use here, and the recorder lacks NICAM	Hi-fi, transmitter handset, digital FX		71
Panasonic NV-FS1 £1000	Poor Good	The control system is poorly organised, with cramped legends and some strange machine logic. Bar code programming is hardly a great achievement either. Picture and sound quality are good, but not state of the art	S-VHS, Hi-fi, NICAM, bar code programming		71
Sanyo VHR-D4710E £900	Very Good Good	Fine colour and moderate detail make for a basically good video section to match a fine sound section. Some of the facilities are a little disappointing however and the deck looks expensive	Hi-fi, NICAM, infra-red headphone remote, digital FX		71

## COLOUR TELEVISIONS

The standalone television set is rapidly evolving into a key component in integrated home entertainment systems. NICAM digital stereo sound is now being broadcast for several hours a week from London and Yorkshire transmitters, so stereo CTVs are now becoming available equipped with NICAM decoding and with rather more attention paid to the built-in amplifier and speakers. NICAM is also available on Hi-fi stereo

videorecorders (see above), and this is usually the more practical route for hi-fi system integration, as well as allowing favourite musical events to be saved on tape. To both watch and record with stereo sound will require NICAM on each of course, but the decision to update one or the other first will probably have as much to do with the age of the respective components than the convenience of the interconnections.

The ten CTVs tested so far are all luxury stereo models with 'flatter squarer' 59cms tubes of various kinds. Best suited to a viewing distance of about 7ft, these are one size up from the most popular 51cms size sets and take about 23 per cent of the top 30 per cent of the market. All have remote control, Fastext (enhanced teletext), and many have on-screen graphics and flexible in/out socketry.

NAME PRICE	SOUND PICTURE	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ferguson 59K5Q £599	Average— Good	Attractive and compact design highlights unusual (and rather nice) matt finish Super Planar tube. Picture and ergonomics are pretty good but on-board audio is a bit of an afterthought, lacking sufficient welly for music programming; socketry adequate	59cm SP FST, NICAM, Fastext, o/s graphics	R	76
Grundig ST-63-460TT £649	Average— Average+	Bulky set's shape resembles a square-rigged sail; screen tilts back slightly, so might suit floor mounting, though beware room reflections. Picture quality is good, if a touch bland, but ergonomics are fairly impenetrable – no on-screen graphics either. Halfway respectable sound quality is over-enriched by cabinet drone.	59cm FST, NICAM, Fastext		76
Hitachi C25-P759 £699	Average— Average—	Visually very compact and neat, with excellent handset ergonomics and good on-screen graphics and features. Picture quality 'hyped' and compromised by 'peaked' luma response; on-board sound has muscle but not subtlety, and NICAM (SCART) output lacks muting.	59cm FST, NICAM, Fastext, o/s graphics		76
ITT Nokia £629	Average+ Average—	Bulky square-rigged shape helps deliver a respectable standalone sound quality at a modest enough price. A versatile set with good handset but no on-screen graphics, the picture quality of our sample lacked fine detail resolution, lending a 'soft focus' effect	59cm FST, NICAM, Fastext		76
JVC AVS250 £550	Average+ Average—	This compact and delightfully versatile non-NICAM set has respectable on-board stereo sound and lovely screen graphics, along with an infernal handset. Our sample suffered a tuner problem which marred a picture quality which was pretty good when monitoring baseband signals off tape.	59cm FST, Fastext, o/s graphics		76
Mitsubishi CT-2553 STX £649	Average Good	Arguably the best all-rounder in the group, this compact monitor-style set suffers from exasperating ergonomics but the picture is detailed if a shade untidy, the sound lusty if crude. NICAM (SCART) output lacks muting, and colour rendition a shade individual	59cm FST, NICAM, Fastext, o/s graphics	R	76
Panasonic Prism TK-24 W1 £699	Average+ Average—	Handsome but bulky set delivers serious standalone sound quality. Lovely ergonomics but off-air picture quality marred by tuner section noise on our sample (works fine as picture monitor). Good NICAM (SCART) output.	59cm FST, NICAM, Fastext, o/s graphics		76
Philips 5574 £599	Average Average+	Neat and compact for a front-speaker set, this competitively priced allrounder lacks on screen graphics and remote white level (contrast) but is otherwise well equipped, if a shade undistinguished and conservative	59cm FST, NICAM, Fastext	R	76
Sanyo CBP2559 £579	Poor Good+	Lovely subtle and detailed picture quality totally justifies strong recommendation, though handset is obtuse (lacking white level) and on-board sound is dire. NICAM £50 update due early 1990	59cm FST, Fastext, o/s graphics, picture-in-picture	R	76
Sony D2512U £699	Average+ Average	Beautifully styled around the unique Trinitron tube, the sound benefits substantially from the odd looking detachable loudspeakers. Nice ergonomics with good on-screen graphics, the otherwise detailed picture is a little 'hyped'.	59cm Trinitron, NICAM, Fastext, o/s graphics	R	76

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



## PERSONAL MESSAGES

*Paul Messenger, never a great fan of the sound of compact discs, enjoys a revelatory digital experience.*

To tie in with the loudspeaker reviews elsewhere in the issue, I had intended to go into the vexed question of stands and supports this month. Then there was a first chance to hear a prototype of the new Dolby S noise reduction system. But I've had my bellyful of speakers for just now, so the stands can wait. And even though Dolby S looks likely to drive a silicon stake through DAT's undead heart, it's unlikely to appear on any commercial machinery for a few months yet.

Regrettably the same is true of the technology I am going to write about. But it was such a remarkable experience, forcing me to change many preconceptions about CD, that it has to take precedence.

For the six years since its introduction I have remained steadfastly uncommitted to the silver disc and all its works. Sure I've had to write about it – 1.5m mechanisms sold a year, household penetration approaching 20 per cent, that sort of thing. Sure it has been a vital stimulus to the audio/hi-fi industry as a whole. And sure I'm obliged to recognise its importance and use it when reviewing equipment like loudspeakers. But that hasn't been nearly enough to make me actually like a medium whose initials so appropriately stand for common denominator.

The open question that lurks behind the issue of CD's amusicality has got to be whether it is the format itself, the software or the hardware which is to blame – a question that becomes increasingly pertinent as CD sales overtake LP by volume (you should look at the value equation), and as vinyl's share of record shop shelf space and inventory consequently slips back.

I suspect the true answer is that all three factors must share the blame, but there's absolutely nothing anybody can do about the format itself now. Barring a few honourable exceptions, the collective deafness of the majority of those in the recording and music businesses (as evidenced not just by CD but by

recent vinyl releases from such old reliables as Bob Dylan, The Rolling Stones and Robert Palmer) is likewise beyond both the pale and the influence of anybody on the hardware side.

One can take the view that things are likely to get better, as the recording industry gets more experience of dealing with digits, though there's no historical precedent for such optimism. The gloomy view is that frustration will drive us to scouring the secondhand shops and record fairs for vintage vinyl from before the digital age, perforce opting out of the current music scene.

With some of the more interesting pop material now starting to appear on CD single only, such a prospect is very depressing, so the events of the other Saturday have a special significance. Because I've at last heard a player that gives me some confidence in purchasing CD software (or at any rate the odd, isolated example thereof, since it's still too expensive), secure in the knowledge that one day, perhaps a year or more from now, it will sound as good as it did that Saturday.

I'm not going to go as far as to say that what I heard was better than my vinyl system – it certainly didn't sound as warm and cuddly, but the different tonal balance could well have had much to do with that. In any case it's the sort of question that has about as much meaning as "are apples better than pears?" But what I heard was quite unlike any CD player I've heard to date, and is streets ahead of any readily available and affordable player I've come across. (It's probably better than the exotics as well, but I can't vouch for that.)

To call it a CD player may be the literal truth, since it plays CDs, but unfortunately it's also misleading, as this is no commercial product, and no commercial derivation is on the immediate horizon, sad to say. (I'd be near the front of the queue.)

Instead it is an enthusiast's creation, from one particularly

well qualified to mess around, combining the talents of concert pianist, recording engineer and computer consultant. Full of youthful energy and frustrated by a large collection of CDs that didn't sound as good as they ought to, he also has access to the right lab resources. Please note this is NOT a task for amateurs.

It has involved ripping apart a cheap commercial Philips player and spreading the innards out on a piece of wood; chucking away the plastic drawer and bodging together a suspended subchassis for the disc drive, mass loaded with Blu-tack, and with a heavy vinyl style centre clamp/weight to hold the CD down. The on-board DACs aren't used at all, and the display can be switched off, so this becomes purely a transport mechanism (aka a 'turntable'), feeding a digital bitstream signal to an outboard DAC unit. This unit started out in life as a Musical Fidelity *Digilog*, but has been heavily modified internally in ways which I am neither qualified nor permitted to discuss. You can't get one; neither can I; nor can I enter into correspondence etc.

Ignoring the apples versus pears but borrowing an analogy from vinyl replay, the difference between this mish mash of bits and pieces and the highly respected Marantz *CD85* that I've been using for the loudspeaker listening tests was not unlike the difference between a Linn *Sondek* and a Rega *Planar*. And having never before heard a CD player of any sort that can even remotely start to play the sort of tricks a *Sondek* turns quite naturally, I was a little taken aback. For example, it's the first CD player I've heard where the music actually keeps properly in time to a base rhythm when other counter rhythms are laid over the top.

One of the CDs I used throughout the listening tests was a particularly vicious sounding Michael Jackson track taken from the Monster Cable sponsored *Bad Mixes* CD. Much of the harshness and 'splatter' disappeared when it was played on this home brew set-up, and a

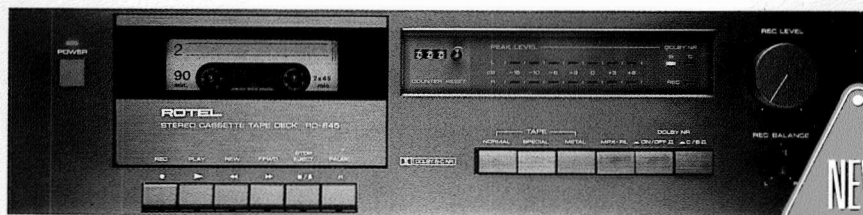
whole lot more sense came out of the music and stereo. So much so that I quickly dubbed the track onto my Sony *ProWalkman* (using Sony's exceedingly nice new 'bargain price' *Metal-XR* tape), to give me some sort of souvenir of the day and recall the performance of this CD rig. The crunch is that replay of this analogue cassette tape is still perceptibly superior in overall timing terms to the CD itself played directly from the *CD85*.

We spent a while messing around with the interfaces, comparing the two transports through the outboard DAC as well as the complete players separately. It's clear that both transport and DAC play comparable roles in the overall upgrade, so it's difficult to say which is the more important. (I have a sneaking suspicion, however, that the Second Rule of Real Hi-Fi: "Start at the front end", may well turn out to be as valid for CD as it is for LP.)

No less extraordinary is the observation that the link between transport and DAC is also quite 'audible'. Change the type of cable and you hear a clear difference. (The same is said to be true of optical fibre links, though these are currently hampered by the speed of current ELCs (electrical-to-light converters). Clearly the little digits used for digital audio are just as delicate and sensitive to outside influence as the perverse little analogue wiggles we've spent 50 years trying to master.

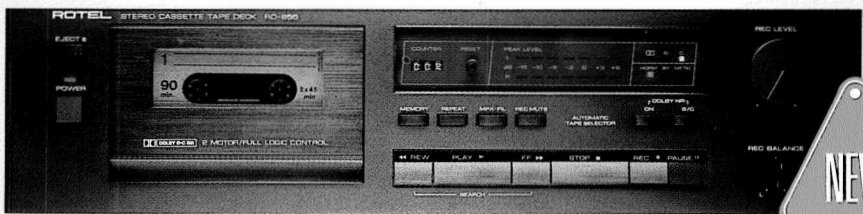
Irrespective of whether the music business can get its act together and start releasing real music again, it is clear that there is now a great deal of room for improvement on the hardware, replay side of CD. The experience of this particular 'breadboard' CD player is uncannily reminiscent of 15 or so years ago when I first discovered what a *Sondek* could do for vinyl discs. And if that particular cycle of history repeats itself, the specialist hi-fi industry can look forward to many more years of happy tweaking and re-engineering, taking CD down the same road already carved out for vinyl.

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