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THE GET OUT CLAUSE

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GUT FEELINGS

Sony's S challenge to DCC

Sometimes it's quite difficult to decide what to write about. Sometimes it isn't. This month, it isn't. The reason's simple. At this year's Brown Goods shows, where the major manufacturers display to the trade what will be in the shops over the coming months, Sony launched a truly groundbreaking product — one that I just had to write about.

The product in question was a Dolby S type cassette deck, or to be more precise, three Dolby S type cassette decks, all due to be launched in June (see this month's *Update*). Regular readers may remember that last month this column addressed the subject of Dolby S type noise reduction at some length, noting its suitability for use in personals and in-car units, and stating that even at £800 an S type deck could prove to be a very cost effective recording device, especially in view of the high price of Digital Compact Cassette machines.

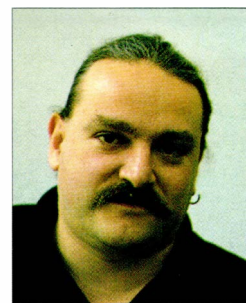
It looks as if I wasn't alone in thinking along these lines. Although the fact that Sony has launched S type decks is not particularly startling, the pricing of the new decks is nothing short of astonishing. The *TCK-611S* is a three head, three motor design, as you would expect for a Dolby S type deck, and also features Dolby B, C and HX-Pro. Yet it costs a mere £299, while its paired-down *TCK-511S* sibling shaves a further £50 off the price. Even more amazing is the *TCWR-635S*, which is a twin deck Dolby S machine at the same £250 price point. As all three decks are less than half the price of the nearest Dolby S competition, such pricing strategy represents stunning value for money from the consumer's point of view.

Dolby S is also more than just a noise reduction system, as Dolby Labs insists on certain minimum performance standards before a machine can use the Dolby S logo and be fitted with the S type

chips. So not only do you get S type noise reduction, you also get a fairly solid indication that the machine is a competent one in the first place.

Sony claims that the price reductions have been possible due to its development of a new single integrated circuit to carry out the S type encoding and decoding, which is considerably cheaper than previous, multiple IC chip sets. While the use of a single circuit undoubtedly does facilitate a drop in production costs, there is no way that this vast price drop can be attributed to the relatively small saving in silicon resulting from the new chip. What I believe we are seeing here is Sony's reaction to DCC. With its new decks Sony hopes to make a huge dent in the tape market, luring people away from DCC and into Dolby S machinery.

As I said last month, Dolby S is a very good system indeed, and is ideal for making recordings that will later be played back on B type machines, either on the move or in a vehicle (that's an M25 joke for readers from outside London). Sony's decision to launch decks at these price points can only be seen as a very positive move. OK, so I wouldn't like to be a cassette deck manufacturer trying to sell a conventional £300 deck against these machines, but the consumer has been presented with the chance to catch up on the very latest technology at an extremely affordable price. And you can't say fairer than that.



Dolby S-expert, Andy Benham, is staggered by the the new low cost Sony decks.

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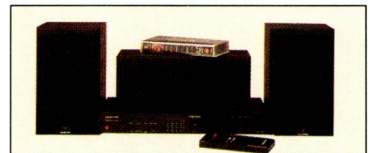
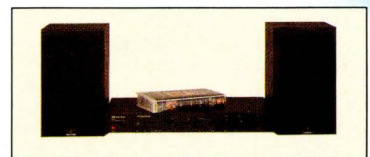


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Update

CHOICE NEWS FROM AROUND THE WORLD

Sony breaks the Dolby S price barrier

In the face of mounting Digital Compact Cassette competition, Sony is fighting back with a new line of Dolby S cassette recorders that bring the cost of this advanced noise reduction technology to an all-time low. The three players in the range, including the first S-type twin cassette deck, all undercut existing Dolby S players from other manufacturers by several hundred pounds thanks to small dedi-

cated Sony designed Dolby S chips.

Top of the range is the £299.00 *TCK-611S*. This three-head, three-motor cassette deck is fitted with a powered door and a ceramic cassette holder. Next in line is the £249.99 *TCK-511S*, which still sports tape cali-

Low prices make Sony's latest range of cassette decks with Dolby-S all the more intriguing.

bration, full logic control and Sony's proprietary Multi AMS track accessing system.

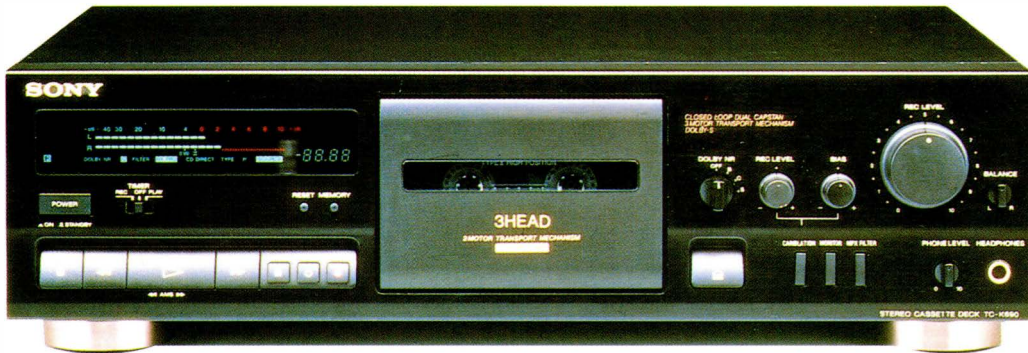
The *TCWR-635S*, also priced at £249.99, is the first twin deck to achieve the rigid tolerances specified by Dolby Labs for Dolby S cassette decks. It features two auto reverse cassette transport mechanisms, one of which records.

☎ 0784 467 000

Huntingdon sweeps board in FBA awards

The 'Cambridgeshire Mafia' dominated this year's Federation of British Audio awards, with six out of the eight categories split between two Huntingdon companies, and a further award going to Cambridge-based Arcam, winning Best Source Component with its *Alpha Plus* CD player. Compered by BBC Radio 2 disc jockey, Ed Stewart, the tenth anniversary awards raised over £5,000 for The Macmillan Cancer Nurses Fund.

Cambridge Systems Technology, better known as Audiolab, picked up four successive awards for its 8000 range of products. Mission Electronics followed close behind, with its 760i speaker picking up the award for Best Loudspeaker below £200, while its 753 won Best Loudspeaker in the £200-£600 category. KEFs Reference 103/4, the only winner manufactured outside Cambridgeshire, won Best Loudspeaker over £600.



Digital wirelessness from Meridian

Hi-tech digital audio electronics specialist Meridian has introduced a matching tuner to its 600 Series, the £1,350 Model 604. The tuner features up to 30 presets, with 12 definable station labels, as well as favourite preset recall and seek tuning.

To work directly with Meridian's active (powered) *D600* and *D6000* digital input loudspeakers, the 604 tuner incorporates a 16-bit, 64 times oversampling Delta-Sigma A/D convertor, which converts the tuner's analogue signal into a digital data-stream. For those with normal analogue systems, the 604 also has a conventional line output.

Internally, the 604 uses an optically isolated radio section, together with four-layer partitioned circuit boards and computer aided design layouts. ☎ 0480 52144

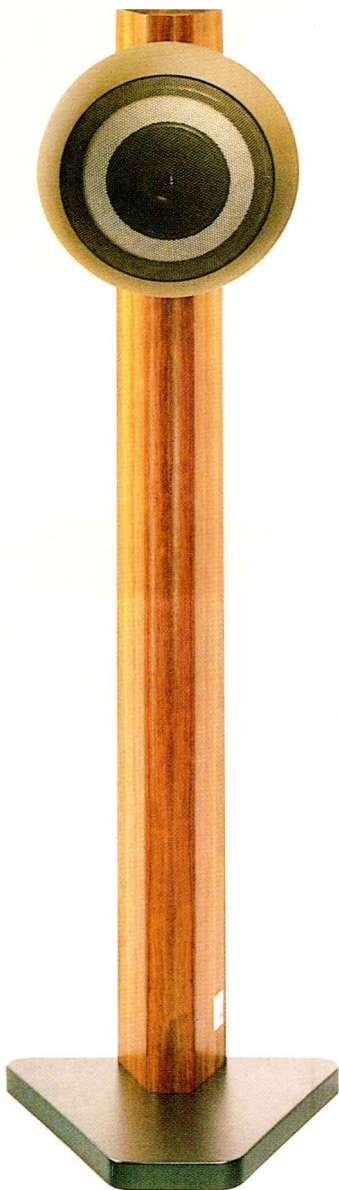


A digital wireless from Meridian to mix and match with the up market 600 Series.

EONs ahead of the competition

Not content with incorporating the basic Radio Data System (RDS), Sony worked together with the BBC to add EON (Enhanced Other Network) to its £179.99 *STS-311RDS* hi-fi tuner. Intended primarily for mobile/in-car applications, EON allows RDS information to be received from other EON channels while listening to any one EON station. For example, if you are listening to BBC Radio One, but a travel information flash comes through on another station an EON-equipped tuner can be set to divert to the other channel for the duration of the travel information without having to re-tune.

The *STS-311RDS* is a three band device (FM, MW and LW), with 30 presets and several tuning modes. It also has provision for two selectable antennae, for those with cable or satellite lines as well as terrestrial aerials. ☎ 0784 467 000



Cabasse multi-dome speakers expand

French loudspeaker manufacturer Cabasse's proprietary 'multi-dome' coaxial drive unit, which behaves like a pulsating sphere to simulate a single point in space, has now filtered down into less expensive high-end models.

The £2,500 Iroise MC and £5,000 Pacific MC consist of two- and three-way multi-dome drive units allied to twin 210mm bass drivers. The £4,500 Baltic MC satellite unit, however, bears a striking similarity to an eyeball on a stick, and needs an additional subwoofer.

At the lower end of the market, Cabasse has launched three new conventional speakers. The new £480 Prao two-way mini monitor is the cheapest speaker in the whole Cabasse range. The £940 floorstanding Chaloupe uses Cabasse's own drive units to produce a claimed 123dB sound pressure level capability. Finally, the Skiff is a £1,500 three-way floorstander, said to be close to the multi-dome speakers in performance. ☎ 0335 300 311

Sharp's tiniest MiniDisc

One of the first MiniDisc players in this country without a Sony brand name on it, Sharp's £400 MD-D10E is claimed to be the smallest and lightest yet. Weighing only 330g, and 84mm by 30.1mm by 109.3mm, this rechargeable playback only device has a scrolling single line LCD display and a maximum battery life of 100 minutes between charges, although a floating recharge system enables the unit to be both recharged and played simultaneously.

The size of the anti-jog buffer memory has been reduced from ten to three

seconds, but this should still let the machine play through all but an earthquake. The MD-D10E has search, skip and random track access, Sharpe's X-Bass boost facility, and a high frequency notch to limit sound leakage from the headphones. ☎ 061 205 2333



JBL Studio Monitors available for the home

The 4200 Series models from JBL are the first JBL studio monitor designs for the consumer market.

The £450 4208 with eight inch driver can handle 300W of power and has a sensitivity rating of 89dB, the £350 4206 with six inch driver can handle 300W of power and has 87dB sensitivity. Striking moulded enclosures provide a welcome alternative to conventional boxes and offer high power handling and a tight and extended bass response. Both speakers are magnetically shielded and have time aligned drivers for improved imaging and reduced phase distortion. One inch titanium tweeters give a clear high frequencies. ☎ 0753 554 900

In Brief

The National Vintage Communications Fair will be held at the NEC Birmingham on Sunday 16th May 1993. This is an exhibition and market organised by and for collectors of vintage radios, televisions, jukeboxes and gramophones, along with all the accompanying paraphernalia of records, magazines and spares. Admission to the Pavilions Hall will be £3, free for children.

TDL has moved to new premises at Unit 2 Pilot Trading Estate, West Wycombe Road, High Wycombe, Buckinghamshire. ☎ 0494 441 191

Dates for 1993's Yorkshire Hi-Fi Show have been announced. It is to be held at the Holiday Inn Royal Victoria Hotel, Sheffield on Saturday 16th and Sunday 17th October. Admission is free from 10-6pm on both days. Contact Sound with Style, Sheffield. ☎ 0742 737 893

Bib AV Products Ltd has brought out a £30 CD Storage Tower to hold 30 CDs. A shorter version of the Bib CD Tower which holds 50 discs, it is similarly made from aluminium and finished with a tough powder-TD coated paint. The smaller tower is currently available in textured black; more colours are planned. ☎ 0442 233 233

Zeus Audio in Northern Ireland has moved to 2-4 Gt Victoria Street, Belfast BT2 7BA. ☎ 0232 332 522

InCar '93 will be on the road to Wembley again this year on 4th and 5th September. The show will feature all that's weird, wonderful and wacky in In Car entertainment.

Linn Products has announced that it will be discontinuing two modern classics of the hi-fi industry, the Ittok tonearm and Isobarik loudspeaker. Originally central to the Linn ethos, both models have been overshadowed by more recent products in the Linn range, and the consequently reduced sales has made it uneconomic to continue production. ☎ 041 644 5111

Skipton based speaker specialist Castle Acoustics has undergone a benign takeover by a team of ex-Wharfedale managers, which will strengthen and reduce the average age of the company's senior staff.

The plan is to maintain the company's high quality while increasing the scale of the operation through a more aggressive stance on overseas sales. ☎ 0756 795 333

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Budget audiophilia from Rotel

Rotel's 1993 sortie into the £200 amplifier market comes in the shape of a new £199.95 RA-935BX integrated model. Designed in the UK and intended for the first time hi-fi buyer, the 40watt per channel 935 has three line inputs and two tape in/outputs, but lacks a RIAA phono stage for vinyl disc. There's provision for two sets of loudspeakers, one switched and one direct, plus a headphone socket.

Despite its near budget price, Rotel has set the 935's sights high, with careful design and high quality components in key areas. The single circuit board design is star earthed and symmetrically laid out and uses a beefy toroidal transformer and slit foil capacitors.

As if to quiet those who feel that the 'breathed on' RCD-965BX LE, is a stop-gap in design, Rotel has launched the £230 RCD-945AX as an audiophile player without the pricetag. This Philips Bit Stream-based player has selected components in important sections and a symmetrically laid

out analogue circuit, with its own power supply. It also has many convenience features such as random and repeat play, plus a 20 track programmable memory. A coaxial digital output is available for upgrading via an outboard D/A convertor, or direct connection to a digital recording medium. ☎ 0908 317 707



The RCD-945AX — an audiophile CD player without the audiophile pricetag?

All change at KEF

A year on from its purchase by Kinergetics Holdings, major changes have been announced among the top management of leading British loudspeaker brand KEF, which are bound to have crucial implications for the future direction of the company.

Most far reaching must surely be the departure of Laurie Fincham, who has headed up KEF's engineering department for nearly thirty years, latterly specifically on the research side of things, during which KEF has consistently been the leading loudspeaker innovator, not just in the UK but throughout the world both in engineering terms and in advanced acoustical measurement and psychoacoustic research.

Laurie will be following a path well trodden by expatriate UK speaker designers and is taking up a senior appointment with Infinity in California. Meanwhile Mark Dodd has left Tannoy to join KEF as product development manager and will be responsible for much of the future engineering direction.

No less important, however, is the arrival (from Bose UK) of Colin Cartwright the new managing director of KEF, a role which was previously handled part time by Kinergetics and Celestion MD Gordon Provan, while Stephen Halsall (ex-Mission/Wharfedale) is also joining KEF as marketing manager.

Budget CD players with sophisticated features

JVC's £140 XL-V1 64BK and £160 XL-Z464BK are the first low price Compact Disc players to incorporate JVC's own advanced one-bit PEM DD convertor chip — an acronym for Pulse Edge Modulation Differential linearity errorless DAC. Combined with JVC's ingeniously named VANS noise shaping system and an eight times oversampling filter, the digital processor is claimed to have improved detail resolution and accuracy.

The players also include 3-beam laser pick ups, programming random access for up to 32 tracks, headphone outputs with volume control and JVC's Compu Link control system. ☎ 081 450 3282



Quid pro Quad

Quad Electroacoustics has replaced its first 66 CD player. Technology has moved on, and the £790 67 CD player is aimed at the top of the CD field.

The 67 is based on a Philips CDM9 Pro transport, used by several specialist hi-fi companies including AVI and Sugden, partnered with the popular Crystal Delta-Sigma DAC chipset, as used in Roksan, Linn and Meridian CD players.

The player has only on/off and drawer open/close switches on the front panel itself, the rest of the controls being assigned to the moulded remote handset. The remote receiver on the player can also receive instructions from the Quad 66 system remote, as with the 66 player. ☎ 0480 52561

Another Pink-Link in the chain

Pink Triangle's controversial Pink-Link modification for the Linn Sondek, has been modified, the latest incarnation changing over to a DC motor and battery power supply, as used in Pink's own flagship Anniversary turntable.

The Pink-Link modification costs £769, including fitting. Existing Pink-Link owners can upgrade to the latest version at a much lower cost.

The DC motor and battery concepts have been central to Pink's philosophy for many years. However, it is suggested that the seeds of the new upgrade were sown when Ivor Tiefenbrun of Linn Products commented that he would opt for a DC motor or direct drive system if he were designing a turntable today (turntable manufacturers' forum, *Audiophile* magazine, Feb. 1992). Ivor counters this by stating that Linn is familiar with other types of motor in the LP12 design, but has yet to find anything better than the latest AC motor, introduced two years ago.

Linn Products takes a dim view of the Pink-Link modifications and notes that any fundamental modifications to the turntable could invalidate any manufacturer guarantees.

The kit consists of a top plate which changes the motor position, the new DC motor and the battery power supply. The batteries have a drain life of ten hours of continuous use, during which the mains is automatically disconnected. When the batteries are exhausted or the unit is switched off, the power supply switches into its fourteen hour recharge mode, during which the motor can be run from the mains circuit, with the battery acting as a great big capacitor.

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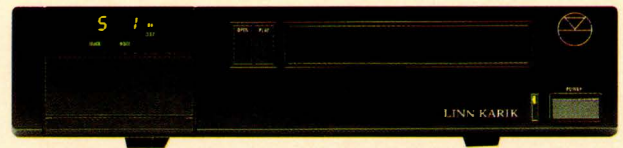
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TURNTABLE UPGRADE

Linn Cirkus

"This broom's fifteen years old", said the kerbside refuse operative proudly, neglecting to mention that fourteen new handles and fifteen new heads had worn out keeping it on the road that long. You could say something similar about Linn's *Sondek LP12*, now surely the most famous of all specialist hi-fi turntables, which unlike many of its owners is still getting better year by year.

The *Sondek* is one of those products that is constantly under development, with minor component improvements incorporated into production on a regular and usually unheralded basis, so much so that not a single item from the Seventies original is still in use today.

Alongside these small changes there've been several major upgrade packages, available for retro-fitting on existing turntables to bring them close to the latest spec. First the *Nirvana* kit improved motor mounting arrangements, then the *Valhalla* board distanced the motor drive from an increasingly unpredictable mains supply. This process was taken a major step forward with the outboard *Lingo*, introduced in 1991, while the *Trampolin* suspended base improved environmental isolation in 1992.

Now, for the first time in very many years, it's time for the main bearing to receive attention. Which is where *Cirkus* comes in, the 1993 *LP12* update kit that comprises a new and distinctly beefed up bearing housing and subchassis with matching inner platter hub, plus replacement armboard, springs and grommets. All of which is expected to cost around £285 including installation by your friendly neighbourhood Linn dealer.

There's much more to a bearing than meets either eye or fin-



Elephants not included: the Linn Cirkus upgrade kit does include a new bearing (centre) and subplatter.

gertip, but I don't plan to switch off 90 something per cent of readers by delving into the subtleties of roundness, spindle grinding techniques and coefficients of thermal expansion. Linn has spent more than twenty years trying to perfect this particular component, and should have a better idea than most about what's going on. The heftier bearing housing is much more firmly fixed to both subchassis and its reinforcing U-section, resulting in significant stiffening of the bearing to armboard link.

I've been using the current full monty Linn turntable (*Sondek/Ekos/Arkiv/Lingo/Trampolin*) for some months now (on a part time basis alongside a

Naim oriented and Mana supported *LP12*), so after playing a few favourite tracks through *Kairn* and *Klout* amps and *Keilidh* speakers, the Linn was whipped away for its *Cirkus* rebuild. When it came back from the kitchen worktop an hour later, and even allowing for the improvement any rebuild is bound to introduce, it was hard to believe that much of the turntable had remained unchanged, so dramatic was the overall improvement, especially in terms of dynamic range and 'punch'.

To be frank, the new Linn sounds remarkably un-vinyl-like, in a way which is bound to upset some vinyl devotees, but also with a solidity, coherence and an astonishing amount of musical detail which brooks no argument. As I wandered back through record collection highlights over the next few days, the phrase 'it sounds like mas-

ter tape' kept coming to mind.

Whatever one's personal reaction to the sound that the package creates, which is where all the controversies about personal taste and prejudice usually come in, there's absolutely no question that the *Cirkus*-equipped Linn now does a substantially better job of extracting the musical message out of the vinyl medium — which is after all what Linn has always said it's trying to do. As such it's an unqualified success, and is almost certainly the most cost-effective upgrade any *Sondek* owner can make.

Although I can't argue with the sheer effectiveness of Linn's top turntable package in vinyl information retrieval terms, the presentation of the sound might not be to every taste.

The bass is distinctly dry and almost too well controlled, while the presence and treble have insistent and assertive tendencies, giving a rather clinical, almost ascerbic character which may not suit those looking for something romantic and warm to cuddle up to on a wet evening. But when all is said and done, the truth is rarely romantic, so maybe it's time to discard those rose-tinted spectacles and find out what really is on all those records I used to know so well.

Paul Messenger

VERDICT

Linn Cirkus LP12 upgrade
£285

PROS: Dramatic improvements in dynamic punch and range.

CONS: Perhaps too clean and clinical for vinyl romantics.

LINN PRODUCTS,
Floors Rd, Waterfoot,
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LOUDSPEAKERS

B&O Beolab 8000

Trust B&O. Along comes a product, and it's totally unlike anything else on the market, a couple of light years beyond your imagination, and stuffed to the gills with original ideas and engineering. It also costs quite a lot of money; such is life.

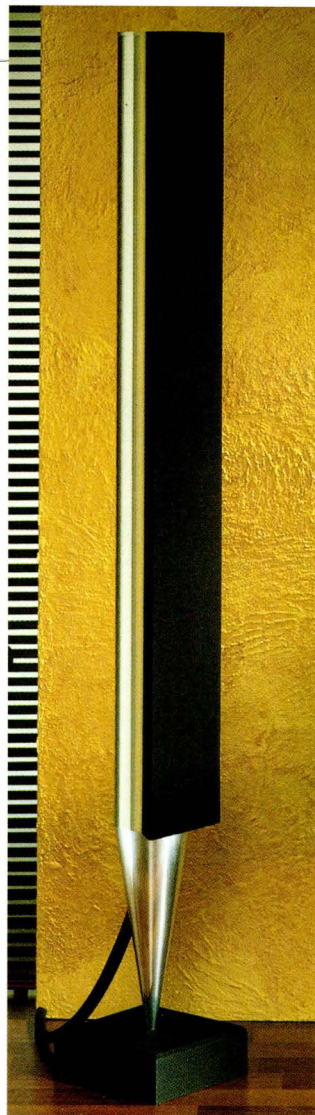
The predictably gorgeous component shown in the photo could be an organ pipe, a giant-sized pencil, or maybe some fancy kind of standard lamp. In fact it's a loudspeaker, or to be more precise an amplified active loudspeaker, with a number of conceptual similarities to the tiny little speakers that come as part of the 2500 stereogram.

What really sets the £2,025 Beolab 8000 apart as a lifestyle product is the packaging and the superb finish. Well over a metre tall, you can hardly call it minimalist, but the other dimensions are vanishingly small, and at least half the outside is optically reflective, helping make it remarkably unobtrusive.

The standard lamp analogy is particularly apt: it has the same stability, the same trailing wires, and the same total flexibility to put it wherever it's wanted at the time — I'm half surprised there isn't an upright built into the top. Magnetic driver shielding means it can be stood right next to a television set, but perhaps the most obvious application is to provide the rear channels for a surround sound A/V system.

Unlike previous B&O active loudspeakers, the company has had the good sense to fit an ordinary phono (line input) socket alongside its own DIN types, so the speaker can be connected directly to any source, amplifier or processor that supplies a volume controlled output (or, of course, a B&O system).

The main aluminium tube is



Organ pipes ahoy. Well no it's the tall, slim and handsome Beolab 8000 loudspeaker.

3mm thick and just 90mm in diameter, tapering down to a threaded end which bolts through the base, the overall shape providing fine inherent stiffness. A narrow (130mm) structural plastics baffle with asymmetric bracing provides the mounting platform for two tiny (c90mm cone) main drivers, a single tweeter, and a port that vents at the very top.

The actual enclosure volume is a mere 5.3 litres, which is roughly the same as a smaller bookshelf miniature. That's because more than a third of the tube is taken up by the drive electronics, the lower metal section of the baffle acting as a heatsink for two power amplifiers and active filter/equaliser, with 160W available for the two main drivers to cope with a substantial boost of up to 8dB in the midbass.

Although the design and engineering all looks very clever and logical, the end result proved something of a disap-

pointment. Put through the same far-field in-room response averaging test that's used for all the main speaker reviews, the 8000 delivered no output of any consequence below 50Hz or thereabouts (which is pretty much what a typical wall-mount miniature can match), and an overall balance that's distinctly less impressive than that provided by the baby 2500 active speakers.

Apart from one perturbation 250-350Hz, the mid/upper bass and lower mid balances very well when placed clear of walls. However, output starts to slope very gently downwards above 500Hz, is -3dB by 1.5kHz, above which the slope increases until the 5kHz output is about 9dB below the bass/mid datum. The mid treble then recovers some 4dB, appearing rather isolated in consequence, or alternatively leaving a 2-3dB suckout 3-6kHz.

What this means in practice is that the 8000 will sound distinctly dulled, and that's precisely the problem. The sound isn't well balanced, leading edge detail is suppressed, and the result is fundamentally thick and boring long before one stumbles on the positive aspects.

Listening through the balance problem, the sound is innately and refreshingly clean, clear and free from boxiness and obvious colorations, albeit slightly time-smearred.

Barring a slightly thuddy quality, the bass is unusually crisp, even and detailed, at least as far as it goes (which isn't all that low). Indeed, the speakers themselves seem almost to vanish sonically, leaving behind a very coherent stereo soundstage. They also go impressively loud — providing the material isn't too bass rich.

But far more than its baby

2500 stablemate, the 8000 is unavoidably dull and laid back. This may well be deliberate, ensuring the speakers will still sound nice and kind when fed even the most aggressively balanced recording or broadcast, or it may be a function of the distribution discontinuity caused by the crossover transition from a twin point to a single point source. Whatever the reason, the effect does rather detract from the stunning appearance, superb finish and unprecedented siting flexibility that otherwise so distinguish a unique product.

Paul Messenger

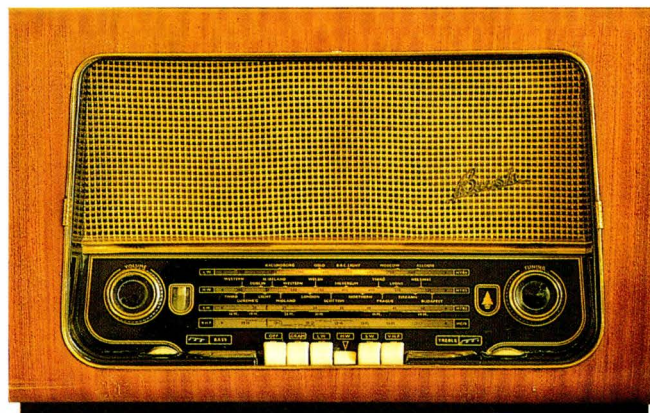
BROADCASTING

Virgin on the ridiculous

Does it make sense to broadcast a new national radio station, playing album rock, on the low-fidelity AM band? Virgin 1215, launched on April 30, was disqualified from applying for the FM waveband by the Broadcasting Act 1990. It transmits instead on the old Radio 3 AM frequency of 1215 kHz, using 1197, 1224 and 1242 kHz for low power relays in some areas.

The Act ruled that pop, rock and soul were barred from the prime FM slot on the dial, and in due course the FM national commercial licence — the first of its kind — was awarded to a classical music station. Classic FM is now available in most places and some nine per cent of the adult UK population tune in each week. This figure is better than the industry expected and is widely regarded as good going.

But another service doing equally well is an AM station that doesn't even cover the whole country. Atlantic 252 recycles recent pop hits from stu-



A masterpiece of AM receiver technology in its time; the '59 Bush.

VERDICT

B&O Beolab 8000

■■■■□□□ £2,025

PROS: Stunning appearance, high siting flexibility, go loud.

CONS: Unavoidably dull, laid back sound.



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All quotes from Feb. 1993 issue of What Video by Bob Tomalski.

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dios in the Irish Republic using a long wave transmitter that reaches only the west and north of the UK. And despite this restricted coverage, it too has nine per cent of UK adults tuning in. With the right programming, it seems that pop audiences can be persuaded to use AM, despite the obvious quality handicap. Other listeners, too, have migrated to the band in droves.

There is a vociferous campaign from Radio 4 fans who are dismayed by the prospect that next year a rolling news service will take the place of The Archers, Just a Minute, etc on the familiar long wave Radio 4 channel. They either can't or don't want to tune to FM, and are mighty cross at the prospect of losing what they've got at the moment.

All this should give cheer to the executives at Virgin Radio, who would surely not have opted for AM given the choice. Networks are winning listeners from local radio, and AM — despite being a minority medium — is holding its own.

AM does have some saving graces. Fringe area FM, especially in a moving vehicle, can be a dreadful earache of fizzes and pops, while out-of-area AM services fade away more gradually and gracefully. And AM certainly refreshes the parts FM can't reach. People in hilly and remote areas who are cut off from FM signals usually find that AM reception presents much less difficulty.

And although it will never be high fidelity while all frequencies above 5 or 6kHz are removed at the transmitter, listening to AM does not have to be an unpleasant experience.

The most satisfying and earhole-friendly AM radio I've ever heard was not a modern tuner but a massive Bush valve table wireless of 1959 vintage. It was a masterpiece of technology in its time: tuned circuits instead of ceramic filters to select the wanted signal without steep cut-offs and ringing, high voltage valve circuits that could take strong signals in their stride, and a nice smooth Class A output stage. A fair bit of second harmonic distortion was present, but nothing nasty at all.

Back in the Nineties, Astra satellite users may like to know that BBC radio is now available on subcarriers of the UK Gold channel (transponder 23). Tune to 7.38 MHz for the BBC World Service, 7.56 MHz for Radio 4 with the FM opt-outs, 7.74 MHz for Radio 1 and 7.92 MHz for Radio 5. All the services are in mono, but there is now an opportunity to escape AM when listening to Radio 5 or the World Service.

Perhaps Virgin 1215 will also find a satellite slot offers a way to overcome the limits of AM quality. Using the AM channel to whet the appetite might in turn encourage satellite radio listening, which has so far failed to make much impact in the UK.

Norman Mcleod

CARTRIDGES

Linn Arkiv

Latest in the long line of Linn moving-coil cartridges which have dominated the upmarket UK scene since the Supex models of the early Seventies, the £998 *Arkiv* can be seen merely as a logical development of its ancestors. But it is also significantly more a Linn cartridge than its predecessors, and therefore truly comes into its own in a Linn system context.

As a long term user of Linn's moving coil cartridges, I can still clearly recall the shocking improvement of changing from the *Karma* to the *Troika* some five or six years ago — and the even bigger sense of dismay when I tried to go back to said *Karma* a couple of years later, having worn out my first *Troika*.

Much the same is true of the *Arkiv*, which as its name implies is (another) likely contender for the title 'last great pickup cartridge of all time'. It actually retains the same moving parts (coils, cantilever, stylus) as the *Troika*, with all the changes concentrated on greatly improved mechanical integrity in the stator elements (magnets, pole-pieces and the solid T-shaped mounting frame), now encased in a plastic see-through body which is more functional than particularly classy.

I first heard a pre-produc-

tion sample as part of the complete *Keltik* active system reviewed in the 1992 *Choice Collection*. And was deeply impressed, by the improved speed, coherence and neutrality over the *Troika* design, which was really beginning to show its age by 1992.

During that year I tried a number of alternative high-end cartridges, including models from Lyra, Dynavector, Audio Note, Transfiguration and Decca, experiences which made *Troika's* recessed presence character (a classic moving coil trait in the past) increasingly difficult to tolerate. Yet at the same time — often more because of mechanical and electrical incompatibilities in my system than inherent limitations — the *Troika* always remained the boss of the bass.

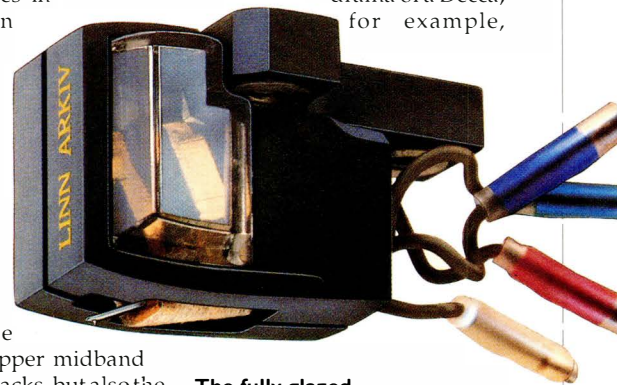
The arrival of the *Arkiv* provided both the much flatter balance through the upper midband that the *Troika* lacks, but also the sort of bass slam, timing and control that has always distinguished Linn's moving coil cartridges, especially when used with Naim or Linn preamplifiers. It also tracks rather more securely and consistently than its predecessor.

But that still leaves the burning question: what does it actually sound like? And the answer, apart from a bottom end that's drier than a Bond Martini, is that I'm not at all sure. I've now tried it in three different turntable combinations, into several amps and many speakers. So far the cartridge itself remains stubbornly neutral, inasmuch as all it seems to do is show up, perhaps a little too clearly for some tastes, just where a particular turntable/arm's limitations lie.

I was conscious there was something missing when using it with both the standard and the Naim/Mana versions of the Linn turntables, but then the arrival of the *Cirkus* update (page 12) really brought out the

Arkiv's exceptional qualities. And of course its dry bass should suit the bass-rich balance of Linn's top *Keltik* loudspeaker particularly well, which reinforces my earlier point about this being a very Linn system oriented device.

I suppose you might call it a little bright, but that's partly because the bass is so tightly controlled, and the adjective sweet seems somewhat inappropriate, which might not be welcome by those who prefer to sugar the modern recording practice pill. What it certainly doesn't do is romanticise either the sound or the music in any way, and while I wouldn't say it has quite the up front dynamic drama of a Decca, for example,



The fully glazed Linn Arkiv cartridge should open the window on your LPs.

neither does it suffer the Decca's edge-of-the-seat uncertainties.

The simple truth is that this is an outstanding cartridge which combines exceptional sound quality with very practical and widely usable mechanical and electrical compatibility. The only real reservation is that it might be a little too honest and clinical for some tastes.

Paul Messenger

VERDICT

Linn Arkiv

■■■■■ □ £998

PROS: Solid, clear and very coherent, good compatibility.

CONS: Might be too clinical for some tastes.



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Worth more than its weight in silver, the Audio Note AN-S7c is the stuff of analogue dreams.

MOVING COIL TRANSFORMERS

Audio Note AN-S7c

A four and a half £k step-up transformer. 'What is he on?' I hear you all cry. That's classified, but the Audio Note AN-S7c is such a statement of the transformer art that I had to write about it. The price is ludicrous but I'd be extremely surprised if there's anything else out there which is this good and this flexible. I suppose the only real competition it has comes in the form of the high-end phono stages which American amplifier companies have a proclivity for producing at prices ranging from almost affordable to truly extreme. However, with moving coil cartridges like the Audio Note IO which has a grotesquely low output and a preference for an almost equally low matching input impedance, active (powered) vinyl disc stages have a great deal of trouble coming up with full bandwidth, noise free action. That's one excuse for reviewing this small object of desire; the other is that the combination with an Audio Note M7 Silver preamp has surely got to be what analogue audio gratification is all about.

To get back to the nitty gritty, the AN-S7c is a chunky little box measuring some 14x11x16cm

(hwxwd) with an 85cm output lead made of Audio Note silver cable terminated in silver plugs. Silver is an Audio Note theme (along with high prices) so it will come as no surprise to hear that the transformers themselves are hand wound with silver wire on silvered formers.

What may be less expected is the sheer flexibility of this component. Both the in and output impedances are adjustable on the front panel, although the input range (1-40ohms) might not go high enough to suit some models. And given that 99.9 per cent of MM vinyl disc inputs have the same 47k input impedance, the output adjustment might seem a little unnecessary. The rear panel has two sets of input sockets, one specifically for the IO which bypasses the impedance switches and goes straight for the one ohm tap that the cartridge favours. There's also a switch which connects or disconnects the shield of the tonearm cable to earth.

For the most part I used the AN-S7c with an IO and the M7, but it saw some service with the Audio Innovations P2 reviewed this month and a van den Hul Grasshopper cartridge. Up until this device turned up I had been using a silver wired Audio Innovations Series 1000 transformer, which wasn't capable of offering as low an input im-

pedance as the IO prefers and therefore was at a relative disadvantage.

The AN-S7c's most fundamental effects are to increase resolution of low level detail, bandwidth and the subjective signal-to-noise-ratio. This essentially means that you can hear more of the music: subtle intonation, the sense of acoustic environment, dynamics as in the absolute level of individual notes and all round musicality are resolved more clearly with no loss of homogeneity. In more emotive terms my records just sound phenomenally good. Even in the context of relatively modest power amplification and loudspeakers, I was enjoying familiar records more than I have in a long time.

Experimentation with alternative phono stages and step-up transformers proved that its true value, and thus the reason for spending this much on such a thing, only becomes abundantly clear with the M7 preamp. In other words it doesn't make sense to try and turbo-charge your Croft Micro with an AN-S7c; you'd be better off going for an Audio Innovations or EAR transformer and spending funds elsewhere.

Jason Kennedy

VERDICT

Audio Note AN-S7c

■■■■■ £4,500

PROS: Excellent sound quality, high flexibility.

CONS: Price, needs equally good phono stage.

AUDIO NOTE UK LTD,
Unit 1, Block C, Hove
Business Centre, Fonthill
Rd, Brighton, BN3 6HA
Tel: (0273) 220 511

The Gigantic Pink Thing

One of the things I find most astonishing about the change-over to CD is the glee with which many people throw out their LP collections, including records not yet (nor likely to be) reissued on CD. As much as to say, 'This performance can't be any good — it's not 16-bit digital!' If you disagree with me on that, you certainly won't share my interest in collecting 78s.

Obviously, 78 replay requires a record player that goes round at 78rpm; it also calls for a larger stylus size than those used by LP and a different replay characteristic from the standard RIAA equalisation. Having long nurtured an interest in high quality 78 replay, being much involved in electronics and hi-fi, and since apparently no one was making the preamplifier I wanted to use, I decided to make it myself. Accordingly, I designed a suitable basic circuit with variable replay EQ and correctly derived mono and started to make enquiries among 78 collectors about what might be required, in case I had forgotten anything. Little actually came of this, except that I got in touch with a potential customer even before the design was properly in production — one Eddy Grant of Ice Records.

Yes, the Eddy Grant (though I must confess that at the time I'd never heard of him) explained that he had bought a large collection of historic Caribbean calypso 78rpm records, and wanted to reissue them, with the best possible sound, on CD. He therefore needed a complete record playing system. Knowing that Pink Triangle of-



Eddy Grant's gigantic but not very pink new gramophone.

fers a 78 version of its decks, and having a high regard for PT products, I contacted Arthur Khoubessarian. We worked out that the system should have a speed range of 60 to 110rpm (plus 33 and 45), capacity for 16 inch records (to cope with studio acetates, which can be this size) and variable equalisation to cope with practically any record made since 1925 (ie 'electrical' recordings). It also needed a high quality cartridge with a 0.003 inch tip, and was required to be both transport and studio-technician-in-a-hurry-proof.

What eventually emerged was a monster of a turntable, derived from PT's *Little Pink Thing* but scaled up considerably. Starting off with a 16inch acrylic platter, the deck also has a tough bearing to cope with expected abuse, a PT 'egg-shaped' subchassis mounted on anti-vibration mounts and a 12 inch SME 312 tonearm. The cartridge is a Denon 103 retipped for 78s by Expert Pickups. The whole thing is mounted in a large flight case.

Robustness is a critical issue in professional gear such as this, a point emphasised to me repeatedly by Brett, PT's factory manager. I was quite happy to use a standard rotary switch (as used in dozens of hi-fi amplifiers with good reliability) until Brett assured me that it would be broken by heavy-handed use in weeks. There isn't much one can do about a moving coil cartridge, but the SME arm was chosen as much for its legendary unbreakability as its excellent sound quality.

As for sound quality, preliminary results are most encouraging, both with this deck and with a 'normal' 78rpm LPT which I am currently evaluating. 78s are in fact capable of much better sound than one usually hears from them, and the aim of this work is to optimise transfer off disc; the use of various de-clicking tools may follow, but as with LP replay, performance of the front end is paramount. The high quality moving coil cartridge is far ahead of the very cheap and none too cheerful models more often used, which resemble the sort of device most people banned from their Dual 505.

Richard Black

Project Jukebox

The National Sound Archive, the nation's record collection, has used the occasion of its tenth birthday to launch Project Jukebox, a move which, if successful, could be the forerunner of home access to its collection of recordings, via telephone or cable TV lines.

Project Jukebox is part of the European Library 'remote delivery' plan which will link the NSA to other sound archives in Europe, enabling users to listen to recordings, piped digitally down cable lines. While of great importance to researchers, who have to travel to hear rare recordings at present, the project is also seen as a pilot for a home record library service.

At present the UK, Denmark, Italy and Norway are taking part in Project Jukebox which will cost £500,000 of EC money over the next two years. The main task will concern cataloguing the contents of the NSA, and transferring recordings onto digital media, such as CD-R or DAT, for distribution. The NSA estimates it may have as many as 1.8 million items, from Queen Victoria or Alfred Lord Tennyson on early cylinder recordings through to Betamax recordings of BBC radio and TV soap operas. The whole panoply of recorded sound comes between, both in terms of programme content and the development of sound carriers. Early acetate discs, wire recordings, close to a million shellac 78s, multifarious tape formats and our beloved microgroove black vinyl and pitted silver plastic discs can all be heard.

While many in the hi-fi and record industries see something like Project Jukebox as akin to killing music — in terms of telephone line sound quality, and

maintechnical hurdles for wider usage will be access time, so that if you requested something already being played, you might have to wait."

While potential subscribers to such a futuristic dial-a-disc service may be gratified by such comments on sound quality, the NSA's most valuable service at present is surely as the national record collection. Access to this is free, though by appointment. Archivists request four days notice to trace recordings, especially the rare ones, since many of these are kept at other British Library sites.

You can't handle the records themselves which are played (generally on Thorens decks) by staff while you listen through headphones.

Many recordings, especially early acetate discs are in danger of disintegration and the NSA is busy recording these onto new media for posterity, as well as researching preservation techniques. "We try to keep sound quality as faithful to the original as possible on transfers," said Alistair Bamford for the NSA, "so we don't use any compression or editing. They're there as they were, warts and all."

The NSA, which is based in Kensington, also houses a comprehensive book and periodical library covering both the technical and musical sides of its operation. You can browse through magazines as diverse as the *Bio-Acoustics* journal or a copy of *Rolling Stone*; the library keeps some 200 periodicals from around the world.

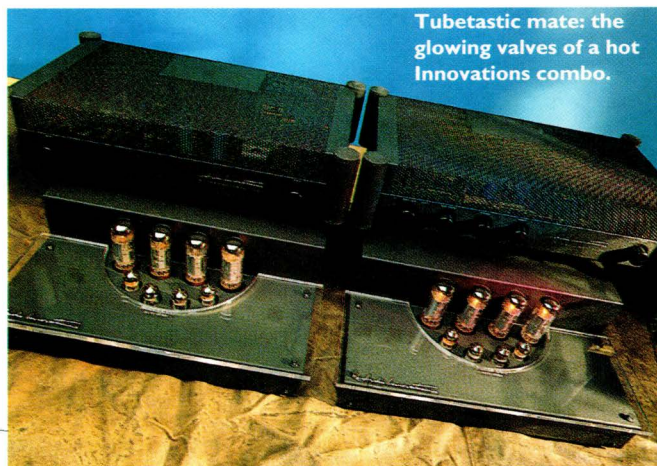
Dan Houston



Now that's what I call a record collection; just a few of the NSA's myriad recordings.

in taking the fun out of browsing through record shops (not to mention record sales), the system does have supporters.

Bob Stuart, designer of Meridian products and a technical advisor to the NSA, said it was more likely that optical cables, laid by TV companies, would carry audio signal into people's homes. "Telephone lines really don't have the dynamic range for musical information," he said. "I suppose digitally they'd give you about an 8-bit range — but that's pretty miserable. Wide bandwidth optical links would be much better and you'd be talking about CD sound quality, though the system is likely to use data compression like DCC. After cataloguing, which is the biggest problem now, the



Tubetastic mate: the glowing valves of a hot Innovations combo.

AMPLIFIERS

Audio Innovations P2/L2/ Series 1000

Audio Innovations, now a part of the Entel group that owns AR, AKG, International Jensen etc, is a completely different animal to the Brighton based company that was set up by Peter Qvortrup in the mid Eighties. The manufacturing operation is now run in Weymouth

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Choice Sessions

by Paul Masson and Richard Stockley, with dramatically improved production standards throughout the range.

The component parts of this particular amplifier combination are the new £899 P2 MC (high gain) vinyl disc stage, £699 L2 line preamplifier and (£2,248 for the stereo pair) Series 1000 Silver power amps. The P2 is available in easily upgradable lower gain MM guise (sans 20 and 80ohm impedance step-up transformers) at £200 less. It also has a gain control, primarily for adjusting to the output level of different cartridges, but potentially enabling vinyl enthusiasts to avoid using a preamp.

The L2 has five line inputs, two main and one tape output. It also has a pair of switches on its rear, one for alternative earthing arrangements and another for high or low output levels to suit different power amps.

The Series 1000 is a 50W monoblok power amp that Innovations has been making for a long time now, but which was rejuvenated by a complete redesign about eight months ago.

The pair I used had the added bonus of silver plated circuit board tracks and silver internal wiring, which adds a £750 premium to the price of a pair.

I used this set up with a Voyd/SME IV combo, the Accuphase CD player and Audio Note AN-E speakers. The cartridge for the most part was a van den Hul Grasshopper, which yielded impressive enough results even though it seems unusually prone to noise with tube preamps.

Initial impressions of the set up were good but not entirely enthusiastic; noise levels were higher than average and although not offensive, weren't exactly encouraging either. Valve amps often have a higher level of residual noise than their solid state relations, especially where low output cartridges are concerned, and to an extent this is a tolerable tradeoff for the advantages of the technology. But there's a point above which it can become intrusive and the P2 breached this point. Yet somehow it didn't seem to intrude when records were being

played quietly, even though as soon as the needle left the groove noise raised its pointed head.

I particularly liked the sense of power that the big amps injected into rock music, especially at low frequencies where they made good use of the bass weight proffered by the big Accuphase CD player. But it wasn't until after I'd left the P2 and L2 turned on for several days that the extent of their resolving powers became clear. They are remarkably uncongested, never resorting to compression or muddling when the going gets tough. Using the P2 direct I spent many hours reveling in fantastic records and remarking on how good they sounded with this set up. It even compared quite favourably with the expensive Audio Note M7 preamp that sounded more fluent but not a lot more detailed.

Despite being quite relaxed it was also very capable of presenting the drama and power in music. CDs especially revelled in the dynamic range and power on tap. At one point I tried to A/B compare the onboard step-up

with an old Innovations model but made the mistake of playing Albeniz' Asturias which reduced me to a quivering wreck and destroyed any chance of objective analysis.

While the power amps were not entirely suited to my AN-E loudspeakers this Innovations set-up was able to convert the signals it was being fed into live and sometimes dangerous music. I've heard cleaner, more dynamic tube amps but not at this price. The P2/L2 combination is particularly impressive and looks like very good tube value.

Jason Kennedy

VERDICT

Audio Innovations P2/L2/1000S
■■■■□□ **£3,846**

PROS: Dynamic and powerful with good resolution.

CONS: Could be quieter, need careful system matching.

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RECORDINGS

Massenet: *Le Cid* & *Scenes Pittoresques*.

City of Birmingham Symphony Orchestra/Louis Fremaux Klavier KCD-11007 CD, KS-522LP

Back in 1971, EMI issued these performances of colourful Massenet orchestral scores on its Columbia Studio Two label. One of the first recordings made by the City of Birmingham Symphony Orchestra under its then new conductor Louis Fremaux, word soon got out that here was an excellent equipment demonstration record. EMI, recently committed to four channel sound, also made an experimental quadraphonic taping which eventually saw release as a separate SQ Quad LP in addition to the standard stereo version.

The music itself — lively and tuneful, with lots of bright colourful effects — really found orchestra and conductor in their element. In 1971 the CBSO may not have been the elite ensemble it was to become under Simon Rattle, but what they lacked in refinement was more than off-

set by sheer enthusiasm and exuberance.

Of course the EMI LPs are long deleted, as is EMI's own CD reissue on the Studio label, so three cheers to Klavier for restoring these recordings to the catalogue on LP and CD. The LP is a straight reissue of the original, but the CD adds music by Berlioz and Offenbach to increase the playing time from about 42 minutes to just over 57 minutes. Pressed on 180g vinyl, the LP has been re-mastered and cut by Doug Sax at the Mastering Lab in LA, with the pressing run limited to just 1,000 copies from each stamper to ensure top quality.

Cutting levels are very high; noticeably louder than the original EMI LPs, with a sharper more forward or immediate balance and less acoustic depth. Most Fremaux/CBSO recordings were made in the Great Hall of Birmingham University

which produced a very rich reverberant sound.

The LP transfer is good in terms of impact and dynamics, but some warmth and naturalness has been sacrificed for extra bite. Much will depend on the equipment used; it can sound aggressive and a touch thin at the extreme top end, while systems with prominent treble may reveal edginess in brass and strings.

The rich, warm CD transfer actually sounds smoother and better balanced tonally, albeit with less of the LP's front to back depth and ambiance. These analogue recordings were made before EMI began using Dolby A noise reduction and some tape hiss may be heard, especially if played loud. Like the LP, the CD is transferred at a high level, and in my view both sound best if played a notch or two below normal listening volume. By the highest modern digital standards these recordings

lack wide dynamic range, but the sound has lots of body and really expands during climaxes, subjectively growing bigger rather than just getting louder.

The LP tracks are individually banded in *Le Cid* and the *Scenes*, but alas the CD has just a single track for each. If you knew and loved these per-

formances during the Seventies you'll doubtless want to add this Klavier reissue to your collection; if you didn't, now's your chance to find out what you've been missing!

Jimmy Hughes



MASSENET: BALLET MUSIC
"Le Cid" & Scenes Pittoresques



ENGLAND'S CITY OF BIRMINGHAM SYMPHONY
CONDUCTED BY LOUIS FREMAUX



If I were a rich man . . .

£13,998 buys a gold Rolex, a second-hand Rolls-Royce or a top Accuphase DP-90/DC-91 CD player. While Paul Miller tests, Jason Kennedy ponders whether the DP-90/DC-91 is money well spent.

Accuphase is a high-end Japanese audio electronics company which produces the whole gamut of hi-fi components from amplifiers to tuners to electronic (active) crossovers. But its main recent UK reputation rests on its CD players. The single box DP-70V, for example, received considerable acclaim from Martin Colloms, and firmly established itself as the reference player at that time. Which was one of the reasons I pricked up my ears when it was announced that the latest Accuphase two-box machine had landed on these shores.

Accuphase 'the company' was established as Kenonic in 1972 by the Kasuga brothers, who were also founders of Trio-Kenwood. Its aim was and still is to produce audio equipment of the highest calibre, so it's not the sort of company that puts out a new range every year. In fact new products are relatively few and far between; the DP-80/DC-81 two-box player that preceded this combo was on the market for six years, with only one update during that period.

The £5,099 DP-90 discdrive and £8,899 DC-91 convertor (or digital processor as

it's called) are serious components, a fact emphasised by an uncompromising mass of power amp proportions at over 20kg a piece. Once wrestled out of the cartons the impression of solidity is further enhanced by chunky gold anodised aluminium fascias with apparently only the barest minimum of switches. I say apparently because the processor has a very neat Toblerone section that hinges out below the display, to reveal a greater switch selection. Most of the controls, however, are on the chunky metal handset, with which you can select between



Controlled luxury. The principal CD functions are hidden from view behind a damped Toblerone.

to reducing noise in the various motors. The laser pickup actually has a built in RF amplifier, because Accuphase found the low level output of a conventional laser system was apt to be distorted by interference between the laser and its amp. All the servos in this area are driven by balanced circuits to reduce internal noise, and even the disc tray is clamped once the disc is raised from it. These examples are typical of Accuphase's attention to detail, which influences all aspects of this player.

One reason for the prodigious weight is the inclusion of two mains transformers, one for the control logic circuits and one for the servos and the motor. The other is the use of 8mm thick solid aluminium construction whose overall purpose is the damping of internal and external resonance. It doesn't harm the perceived value equation either.

The *DC-91* is one of the few digital to analogue converters on the market which can truly be called a digital processor. It has a total of thirteen digital inputs, seven digital outputs and three analogue outputs — if that doesn't amount to a digital socket fetishist's dream, what does? Naturally, all possible varieties of interface, including the two HPC options, are provided on the *DP-90*. It also has the facility to accept and put out 24-bit signals, on the basis that it would be ready if ever a higher bit rate system came along. Perhaps it's a first indication that a super CD system is being developed in Japan, or alternatively a sign that Accuphase is prepared to go to

any lengths to make something out of the format as it stands.

The DAC is what Accuphase calls MMB or Multiple Multi-Bit (like HPC, a classic Japanese acronym!), I'll leave the in-depth description to Paul Miller, but put simply each channel uses 16 20-bit converters in parallel, in an attempt to achieve low noise and high linearity. It automatically selects sampling frequencies and can lock onto virtually anything digital you throw at it. And if you are likely to use the *DP-90* as a processor its ability to remember the settings you last used with specific inputs will probably be convenient.

Dithering about

One unusual facility is the ability to switch dither in and out, a process that can't be done with the handset, making A/B'ing a tad tricky. Listening with and without it and using low level music, I was hard pressed to differentiate between the likely psycho-acoustic influences involved in such an unblind test and the real effects. Basically it was very subtle, switching

dither out either introduced more noise or let through more harmonic detail, I didn't end up with a strong preference for either.

So what does all this attention to detail, technology, mass and, lets face

it, expense do for the sound of CDs? Basically quite a lot. From a hi-fi perspective this combo extracts more information than most and presents it in a substantial and precise fashion. It doesn't, unfortunately, turn Frank Zappa discs into less aggressively balanced things; in fact its very resolution reveals more of the coarseness that the man seems disin-

The Gold Standard. Accuphase's two-box CD flagship oozes sophistication.

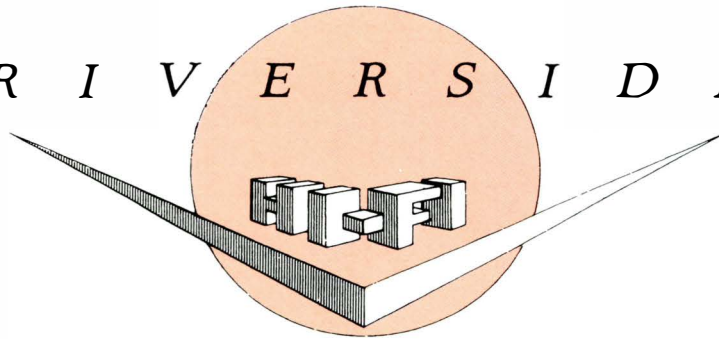
the various inputs and outputs, dim or turn off the display, switch phase and alter volume alongside the usual assortment of high-end CD player controls.

Besides being a monster in scale and weight, the *DP-90* drive is not surprisingly a very slick piece of kit. The drawer opens and closes in silence with assurance and precision, and it's equipped with no less than four output sockets including coaxial electrical, Toslink optical, HPC balanced and HPC optical outputs. HPC, or High Performance Connection, is simply a balanced electrical connection made with a three core XLR terminated cable, and an AT&T optical connection; both types of lead are supplied.

A great deal of attention has been paid

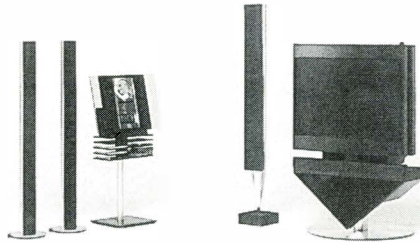
Besides being a monster in scale and weight, the *DP-90* drive is not surprisingly a very slick piece of kit.

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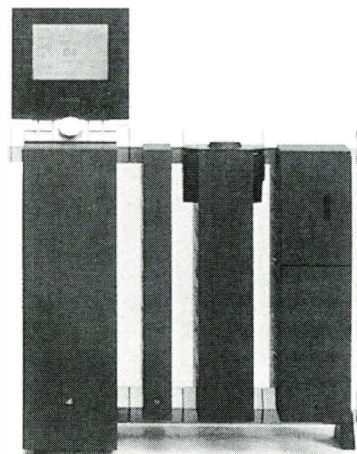
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clined to remove. However, the better discs from a sound quality point of view sounded remarkably architectural, clean and precise. I know it's a cliché to harp on about the bass extension and control of expensive CD players, but the Accuphase was so good in this respect that the solidity, speed, articulation and power that it found on some discs has to be emphasised.

Being an essentially analogue oriented individual it's rare that a CD player genuinely impresses me, so it wasn't until after the Accuphases had been warming up for a few days and I had the chance to play a few discs that their pedigree became apparent. I think one needs to be fed a pure CD musical diet to get to the point where one can get enthusiastic about the medium per se, but having said that some discs did sound remarkably absorbing on this player. On the whole the mellower discs were the most listenable: two of Talk Talk's sparser albums worked very effectively, but heavy duty numbers from the Red Hot Chili Peppers and the like got wearing over a pretty short time, though I'll admit that it's possible that in this case the blame does not lie entirely with the player. I found that if the output of the processor was reduced I could play discs that much longer and louder without them becoming so fatiguing, which suggests the overload margin on the preamp was running into clipping.

Last minute enlightenment

The Accuphase acquitted itself quite well compared with a Marantz *CD-12* combo and the RATA/Pioneer *1750 LD* player reviewed last month. Perhaps surprisingly the RATA came pretty close in some respects, particularly timing, although the Accuphase is in a different class when it comes to detail resolution (at ten times the price it should be too). The older *CD-12* is pretty good at detail and not bad at substance but as a combination it sounded a bit thin and two dimensional by comparison. Contrasting the Marantz disc drive with the *DP-90* was a closer run affair, however: the

... it somehow fails to resolve the crucial elements which make music the uplifting experience which, for many, is the raison d'être behind serious hi-fi equipment.

dearer unit coming up with a more relaxed and open presentation, but the differences didn't really reflect the price discrepancy.

The *DP-90/DC-91* is a first class CD player. It's also a high mass CD player, which must have something to do with its extraordinary low frequency powers. But above all it's still a CD player. It does what the medium has always done but a bit better,

resolving a lot of detail, creating stable, deep and, with the right cables, quite wide soundstages, and always sounding confident. Yet it somehow fails to resolve the crucial elements which make music the uplifting experience which, for many, is the *raison d'être* behind serious hi-fi equipment.

As the time to finish this review loomed nearer, I began to feel that I was asking too much of the CD medium itself and that this player was giving me all there was. However, at the last hour another player turned up which single-handedly restored my faith in Compact Disc and at the same time left the Accuphase sounding rather uninspired. That player was the single box Wadia 6 (£3,800). Until I heard it I was prepared to blame the system, the medium, even my particular discs in order to defend the Accuphase but thereafter my ability to enthuse about this Japanese heavy-weight was, at best, severely hampered.

Accuphase's *DP-90/DC-91* CD playing combination is in virtually all respects state of the art. Build, finish, function, facilities etc are all in the very top league, but unfortunately it doesn't quite stack up with the best when it comes to that most funda-

mental criterion of all, the creation of high quality musical entertainment.

Accuphase is imported by: MPI Electronic (UK) Ltd, Wood Lane, Manchester, M31 4BP. Tel: (061) 777 8522

A measured opinion

Accuphase has drafted in no less than 32 20-bit DACs for what it describes as the Multiple Multi-Bit (MMB) conversion system used in the *DC-91*. In practice a single eight times oversampling filter and some 16 Burr Brown PCM63P DACs are employed for each channel — though, rather than offset each by one-sixteenth of a sample period (yielding an effective over-sample rate of 128 times), or adopting a multiple-differential network of DACs (to reduce common-mode noise and distortion), Accuphase has chosen to parallel-up all 16 DACs.

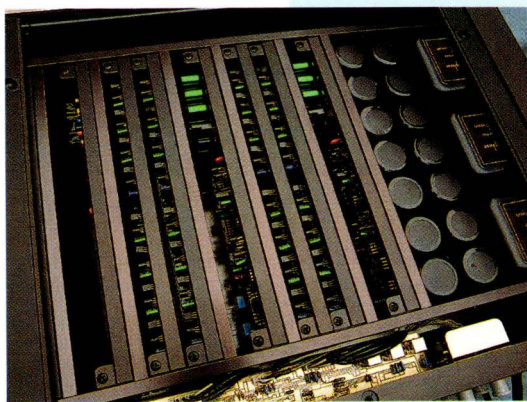
The output of this DAC cluster is summed and filtered in an attempt to realise a theoretical improvement of 12dB in its signal to noise ratio. We know from past experience that single PCM63Ps can achieve a S/N ratio of 110-115dB (issues 101, 103 and 119) so the 121dB measured here seems hardly worth the effort. Noise modulation, incidentally, is also 'summed' and reaches +18dB instead of the +12dB expected from Burr Brown's popular DAC.

Distortion is held to a low 0.00065-0.0014 per cent, however, which is some 10dB better than that achieved by applications of single PCM63Ps even though its third order IMD is some 15dB worse at -78.6dB. On the other hand its low level linearity errors of +0.0/-0.57dB are quickly seen off by the +0.14/-0.17dB of AVI's *S2000MC* (this issue).

In this instance Accuphase's proprietary dither facility had no measurable effect on either distortion or linearity from -60dB to -100dB though, to be perfectly fair, my test signals contain the bare minimum of static quantisation errors for dither to work upon. As an aside, the accurate synchronisation (timing) of all 16

DACs is a nightmarish proposition, just one foible of what strikes me as an unnecessarily over-engineered design with little practical advantage gained for its complexity.

Paul Miller



The well-stacked DAC. Within the computer-like chassis lie 16 Burr Brown convertor chips per channel.



The drummer's choice

The loudness button is always on for Mel Gaynor, rhythm keeper for the rock group Simple Minds, who's been talking to Dan Houston about his hi-fi, music, new technology and musical cybernetics.

Mel Gaynor describes his drumming style as a balance between sheer aggression and sensitivity, so it isn't surprising that he should choose a hi-fi system which reflects his own musical approach.

This month we're in the drummer's home, replete with a complete Harman Kardon set up serving some powerhouse JBL loudspeakers. The setting is a detached house in a leafy Surrey suburb of London, several gold coins' throw from Mel's native Balham. We're in the ground

floor living room next door to his home studio where he's been laying down tracks for Ralph Adu and Lincoln Brown, two singers who have entrusted him with the production of their recordings.

The title of producer is another string to his bow in the sometimes fickle world of Rock music. As a studio session drummer who worked with the likes of Joan Armatrading and Elton John before he joined Simple Minds in 1982, Mel has seen the rise of effects-led production in musicianship including the consigning

of 'drummers' to a computerised box of software tricks.

His own earliest aspiration was to be like the jazz drummer Buddy Rich, and he lists the superlative talents of drummers like Terry Bozzio and Steve Gadd or the jazz percussionist Airto Moreira as his influences.

Mel Gaynor began drumming young, and by the age of 15 he says he was practising eight hours a day with a coach. "The day I left school I turned professional and went straight out on the road

larly want to work with Simple Minds, but I drifted into going on tour with them, and found I got on with Jim Kerr (the vocalist) and Charlie Burchill (the other main member of the group since Mick McNeil left)."

While Mel makes it sound easy, almost casual, he is now into his 11th year with the band and has provided the 'stadium-sound' drumming on most of their 12 albums. He uses a larger than usual custom made Pearl drum kit with a 24-inch kick drum and six toms between 10 and 22inch diameter. The cymbals are also custom made for him by the Canadian firm Sabian in the form of a 14inch EQ high hat and 22inch Power Bells.

Surely getting it all custom made is a bit flash? "I did that because I was looking for a certain type of sound," he assures. The certain type of sound is, let's face it, loud. On tour Mel uses a two kilowatt monitor system just to hear what the rest of the band is doing. So how does it affect his ears? "Pardon?" comes the reply!

"I think it does," he says more seriously, "but on stage guitarists are getting far more deaf, some of them are using five or six kilowatt rigs; you should listen to that! But sound engineers are getting better. There's far more artistry in live sound now — it doesn't just have to be excruciatingly loud, that turns people off."

Simple Minds now has the sort of PA system that a supergroup demands. Tour dates are a logistical nightmare with a 25 articulated truck convoy of the sort UN General Philippe Morillon might use in Bosnia. The present PA was provided by the respected Martin Audio company with JBL loudspeakers. "We never use the rigs or PAs already installed in arenas because you get to know your own system, and if you have something inferior it'll mess up the sound," Mel adds.

This is the main reason he has opted for JBL loudspeakers at home, although it's a domestic system rather than a 'flown' array of bass bins and horn-loaded tweet-

ers! Mel first became aware of JBL's domestic products by hearing an in car system. "I was using Sony equipment in here," he says of the living room. "But then I found out about JBL and Harman Kardon and I checked it out from there. I find the H/K kit is flawless, if I'm honest about it, and I haven't heard a better system than this one."

Harman UK imports both the American-designed electronics and loudspeaker brands in Britain and through his professional music contacts Mel says he 'got a good deal'. The four months old system comprises a CD player, Casio DAT deck, cassette deck and tuner feeding a monster HK integrated amplifier.

Mel admits that his loudspeakers are a bit far apart in the room which is rectangular in shape. There is a good 15 feet between them: "But I had nowhere else to

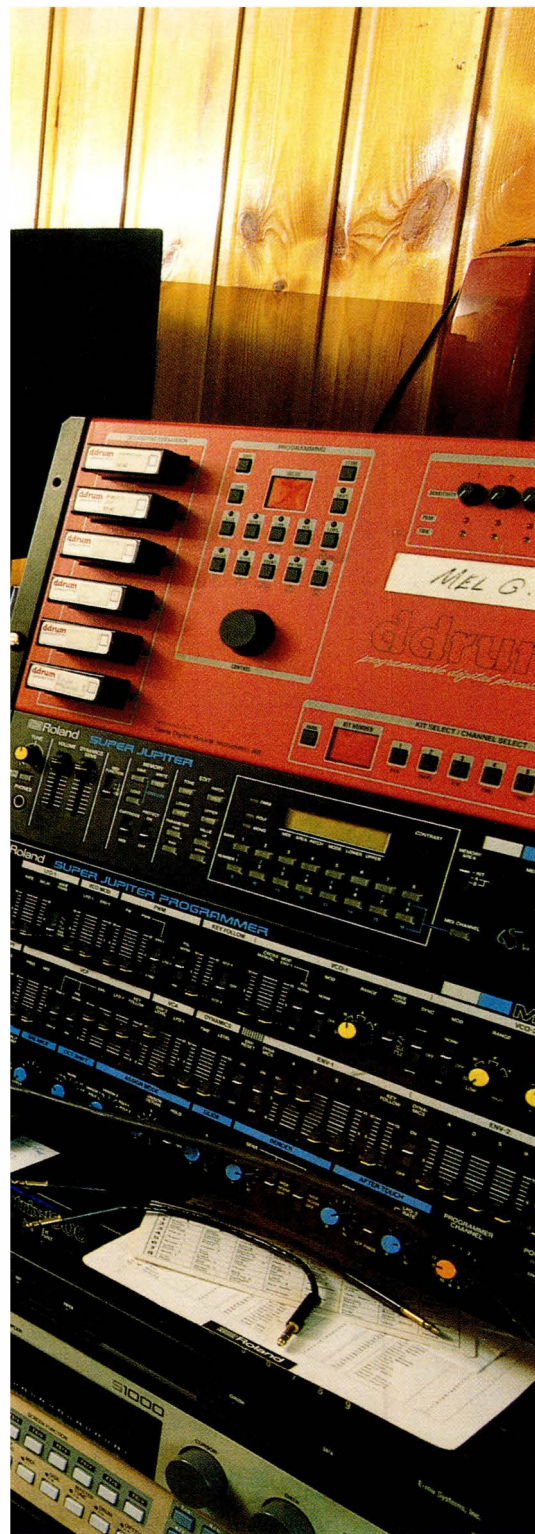
put them," he defends. While pinpoint stereo imaging might not be delivered at its best like this the system certainly has enough power to remind our host of his workstation, and he cranked it up with a Bill Withers CD which forced me to lip-read that part of the interview!

The demonstration puts him in the role of proud but power-hungry audiophile: "I thought

the Sony stuff was good but when I heard this it's like forget it, forget it completely!" he eulogises. You can't deny that it's a rocking system with bags of power in reserve. Nor is it a sound that mashes instrumental timbre — it was just the sound pressure level that brought them a bit too close for comfort on this occasion!

Mel spent most of the budget on the amplifier and loudspeakers, the *Ti3000s* are the second biggest in JBL's flagship range, not counting the awesome *K2s*. Sensitivity is rated at 90dB so they are easily driven by the 120 watt rated amplifier.

The amp is also AV compatible and Mel has wired his Panasonic VCR through it to watch movies in decent stereo with his 27inch Sony Trinitron TV. "We were



Simple Minds' drummer Mel Gaynor in his home studio (above), and (right) his Harman Kardon/JBL domestic system.

with a soul band called the Flirtations," he says. "I was with them for two years before joining a Birmingham band called Muscles which had a sort of funk style. After that I played heavy metal with a band called Samson. Then I came back to London and joined a session group called Gonzalez. I hadn't really heard of Simple Minds in 1982 but I was brought in to clean up the session work on the *New Gold Dream* album. They'd had a couple of drummers before me and I replaced Kenny Hyslop.

"When I got the job I didn't particu-



"... I find the H/K kit is flawless, if I'm honest about it, and I haven't heard a better system than this one."

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watching *Aliens* the other night which was phenomenal through these speakers. I'm thinking of putting an extra pair of loudspeakers in here to make it into a surround sound system," he says.

For now he mostly listens to CDs, and his LP record collection has been consigned to one of the upstairs rooms. "I'm gradually replacing my records with CDs as they come out in the back catalogue. I take a Sony portable CD player when I'm travelling and I think they are the easiest thing to use. Tapes are great for the car and record buffs are always going to be into their collections but I think CD has to be the governing format now."

As a musician he regards the new Mini Disc format launched by Sony as "quite frightening". "I gather record companies want to reduce artist's royalty fees for MD recordings," he says, "but even if that's not the case, it'll still be another opportunity for mass pirating."

High quality, digitally recordable and portable sound, the pirate's dream, comes from the odd man out in this system. It's a portable Casio DAT machine, a necessary component for Mel's production work. "I can bring the DAT from the studio and listen to it at home, which is useful, and it's the standard format used in studios now. The really good thing about it is that it is so easy to use for recording, and it's high quality, very portable and simple," he explains.

On occasion the studio may be his own room which is next door to his lounge. It's a narrow room with the walls lined in platinum and gold discs commemorating Simple Minds' successes. It is stuffed with a comprehensive array of effects and recording equipment based around a TAC *Scorpion* 28 channel mixing desk with Acoustic Energy AE2 and Yamaha NS10 loudspeakers. The big surprise is the complete lack of a drum kit. "I keep my drum kit at a nearby studio — there's a lot more room there. I'm just using (Roland) practice pads at home."

The studio is analogue based, with a one-inch Tascam reel to reel recorder, which is sometimes supplemented with a Sony Betamax video tape system often praised for its audio-carrying qualities. "I like using analogue tape in the studio because I think it sounds more lifelike

than digital, especially with drums. A lot of the dance stuff now is recorded on analogue tape although many people don't realise that when they criticise the sound quality. I'm doing a couple of albums with two singers at the moment — Lincoln Brown and Ralph Adu who's a really talented African singer. We're recording in other studios and then I'm doing some of the production work here at home.

"When I'm working with Simple Minds we use the band's own studio in Scotland, or we might be at A&M in Los Angeles. *Street Fighting Years* and *Real Life* (1989 and 1991) were both recorded digitally, although I didn't like some of the effects on *Real Life*. We used the RSS (Roland Spectral Sound) system when it was first developed. It gives you the sense of being surrounded by sound in the room. From what I gather the producer (Stephen Lipson) didn't like the system too much. After all what's the point of paying all that money for a gimmick which just puts the speakers out of phase?"

He's right. On the song *Woman* Mel's bongos get sent from left to right in a wide-panning stereo image which is great for showing off your new speakers, but which becomes tawdry with repeated playing. Are all effects as short-lived in their effectiveness; should we be getting rid of computers for something as soulful as music?

"I don't have an objection to computers as such," he qualifies. "I like them and I use them, although I find that 97 per cent

of the time I come back to the drums. But if the computer or sequencer is programmed by someone who knows how, it can be a useful addition to your own stuff. So I might record a track on the computer and use it in real time within

the drumming role.

"As far as albums go the live performance has to stand up to the recordings, so Simple Minds' stuff is pretty much recorded with minimal effects. And I think that's very important. I think that to create a good live album it just has to be played well, it's as simple as that. On stage it's all pure acoustic drums... well there may be a few things that I can trig-



Mel Gaynor's New Gold Dream of a system (above) which certainly raises the roof in his lounge (below).



ger off, like some percussion ideas or conga samples on a sequencer, but the programme has to be simple, and that goes for the rest of the band as well."

Of course this is for bands who still 'play' live music. Some musicians couldn't live down the shame and career-stopping catastrophe of a bum note! But many go to a 'live music' event purely for the showmanship of its stars as Mel concedes: "The best show I heard for clarity of sound and lighting was the last Jackson tour — or Madonna in 1988 — I think there were real instruments being used, but they were very cleverly disguised! I don't think Jackson was singing at all and someone told me he even records his local announcements beforehand, it's just a dance routine. Much of it is computerised — the amount of sound he was supposed to be getting from a five or six piece band was impossible. But still, it wasn't as loud as what we're doing!"

How's that for acoustic one-upmanship?

The System:

- Harman Kardon *HD7500II* CD player: £349
- Harman Kardon *TD4600* cassette deck: £699
- Harman Kardon *TU9600* tuner: £499
- Harman Kardon *HK6950R* amplifier: £1,299
- JBL *Ti3000* loudspeakers: £2,499
- System supplied by JBL, Harman Audio UK. Tel: 0753 576 911.

HELP!

WE SORT OUT YOUR SYSTEM QUERIES

More aggression for Napalm Death

Q At present my hi-fi system consists of an Akai AM-32B stereo integrated amp, Tannoy 603 speakers on stands, Aiwa AD-F410 cassette deck and Pioneer PD-S501 CD player. Although I am very pleased with the sound I would like to hear crisper or more punchy bass. Is my amplifier letting me down or is it the speakers? Could you advise me on an upgrade to solve this problem, I listen mainly to heavy metal such as Slayer and Napalm Death. I eagerly await your comments.

S D Wilkins, Warwick.

A I think your problems stem from a combination of a unexciting sounding CD player allied to a pair of less than interesting (or bass-heavy) loudspeakers. As a short-term repair, swap the speakers for a pair of Wharfedale Delta 30.2 loudspeakers. This will give a more coloured impression of music than the 603, but will have more grunt where it counts. Alternatively, try to hear a larger Tannoy model, like the 609 which will certainly give you a bit of grunt.

Eventually, however, this system will ultimately tire, even with metal. When this happens, I would suggest changing the entire system over, and going for Best Buy products well known for being powerful and punchy. For example, a system consisting of the aforementioned Wharfedale or Tannoy speakers, a Harman-Kardon HK6150 amplifier and a Technics SL-PG520A CD player would be a good starting place.

System swap savages satisfaction

Q For three years I listened to a system I found truly warm, inviting and yet still detailed. This system comprised of a Linn Axis/Akito/K9 turntable combination, Musical Fidelity A100 amplifier, Musical Fidelity MC4 speakers, Point 5 stands, and Linn speaker cable. The main frame of the system stood on an independ-



603s: great little speakers but not suitable for inflicting Napalm Death.

ent section of the floor, to avoid obvious problems.

Due to a change in circumstances and the advent of CD, I've had to change a couple of the components, and as I can no longer place the speakers in the middle of a spare room, the MC4s and my cherished Linn went into storage. These were replaced with a pair of Rogers LS2a/2 speakers and a Marantz CD72SE with AudioQuest Ruby interconnects. Now I have the detail but I also have a hard sound that doesn't invite you in. How could you describe such an impersonal sound; standoffish, brittle and clinical?

With my original

system the more I listened the more I relaxed and the more my foot tapped, but with the changes all this has disappeared all I seem to do is wince. Is there a way out?

Ian Gaunt, Daisy Hill, Bradford.

A Well, that's CD for you! Offhand, the only thing I can suggest is getting that Axis down from the attic and pretending that CD never happened for a while. It might be possible to get a little more warmth with an outboard DAC, like the Audio Alchemy DDE for example, but some of the impersonal sound you describe falls at the feet of the silver disc.

It is possible to get pretty good results with CD, especially if you can forget how good LPs can sound, but you need to work at it. I have found that loud speakers in particular can make all the difference, find a pair that don't exacerbate the midrange hardness that digital seems to encourage and you'll find that any decent player can sound pleas-



Linn's Axis is a hard turntable to replace, especially if you are moving over to Compact Disc.

ant at least. However, relaxation and toe tapping timing is asking a lot of the medium, it will do it but at great expense. There are players that come close, however, and they can be found in the Directory.

Teenage mini system headaches

Q I'm taking the liberty of writing to you in the hope that you can help me.

My younger son has requested a CD mini system for his eighteenth birthday. We have now looked at (and listened to) such a wide and bemusing variety of machines that I am currently in an advanced state of audio tremors, with everything dissolving into an indistinct blur before my very ears.

Much as I appreciate that an expert such as yourself operates for the most part in the realms of higher-fi than mini systems (and indeed I have appreciated your words of wisdom for many years now, if not fully understood them). I would be more than grateful if you could offer a solid, unqualified recommendation for a system in the £500-£700 bracket.

I read with interest your comparison of nine such systems in the December issue of *Hi-Fi Choice*, but was wondering if you had encountered a superior system in your overall experience to the Denon D-70 you selected as Best Buy on that occasion. I would also be interested to know if the system you might recommend is available as an option without speakers, and, if so, which speakers you would suggest as a best bet for rich, solid and full-blooded bass when mounted on brackets just below ceiling level. The room is such that they cannot be positioned elsewhere.

Thank you for reading this letter and hopefully considering its contents with an element of sympathy for the simple layman.

John Worthington, Doncaster, South Yorks.

A In short, no. We haven't found a better all-round system than the

Denon D-70 at the price and no, I cannot think of a system at this price that is supplied without loudspeakers, save for the Denon. The D-70 is one of the select few mini systems that can withstand some careful speaker upgrades, and speakers like the Celestion 1 or Wharfedale Delta 30.2 would prove a good alternative to the Denon models. There are single manufacturer systems that perform better, but they are all far beyond the price ceiling you have mentioned.

If you are going to place the speakers high on the wall, remember to keep them about 2-2.5m apart on the same (load-bearing) wall, fixed to solid wall brackets that do not swivel. Whatever happens, avoid putting the speakers into the corners of the room, unless the manual expressly allows it, as this usually causes havoc with bass balance.

Secondhand reassurance

Q I want to improve the quality of my hi-fi. My system originally consisted of a Harman Kardon PM640 VXi amplifier, and a Proton 830R CD with Acoustic Research AR3a improved speakers. My leads are (as far as I know) just basic ones, and I bought the package from a dealer in January 1991 (all items were of varying degrees of second-handness) for £400 all in.

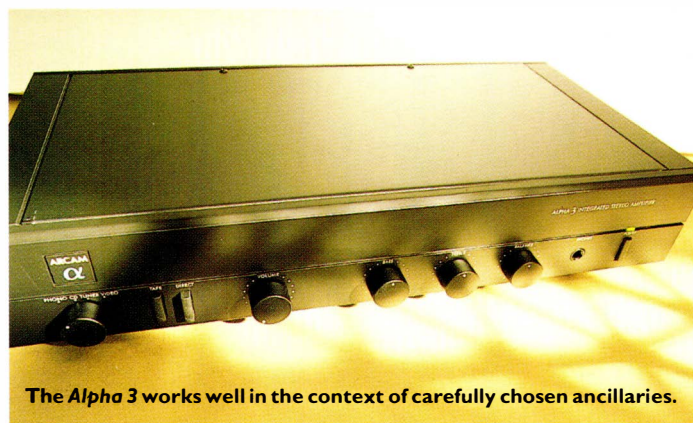
Since then I have picked up an old Trio KT-5300 tuner for £30, and have just purchased an Aiwa AD-F500 cassette deck. The system sounds great, but as I am a definite novice in the hi-fi world, I don't have a yardstick against which to base my judgment.

Is the CD player any good? I was assured it used to be part of NAD, so assumed it was OK. Would it make a considerable difference using good speaker leads and interconnecting cables? Should I have a proper component rack and speaker stands (although the AR3as are extremely large and very heavy)? And finally, does the whole lot seem as if it would go all right together? Oh yes, and what should I upgrade first and what are your suggestions for replacements?

I hope you can answer at least some of these questions. Please just don't suggest that I speak to my dealer as they don't take students seriously.

**Richard Pugsley,
Cathays, Cardiff.**

A I wouldn't worry about the quality of your system, especially if you are happy with it. Harman's amplifiers are well respected, while the AR3a was a classic speaker of its time and should still be fairly com-



The Alpha 3 works well in the context of carefully chosen ancillaries.

petitive today. Although NAD technology-based and therefore competent enough, the CD player could be the weakest link in your system.

Consider replacing it with one of the Best Buy players in this issue. Before such a drastic move, however, I would suggest investing in good cables, stands and equipment tables, as these make a difference without incurring enormous expense (unless you want to). Low stands under the speakers will tighten and focus the sound, especially in the bass. Inexpensive loudspeaker cables (such as Mission's Stranded) should tidy up the frequency extremes, and a good support such as the Townshend Siesmic Sink offer a solid platform for the CD player's delicate innards.

A shortlist for speakers with control and transparency

Q I listen to all kinds of music (with perhaps some bias towards jazz, soul and R&B), and my requirements are very simple—I like to hear the music, not the equipment.

I have a Pink Triangle LPT turntable, Roksan Tabriz arm with Corus Black cartridge, Audiolab 8000.A11 and 12 year old KEF Reference R103.2s. I'd appreciate some advice on what replacement speakers to audition.

I'm attracted by the idea of floorstanders on the assumption that I'll get better bass performance for the equivalent price of compacts plus stands; on the other hand, I'm not going to seek the last few hertz of extension at the expense of control and transparency. Some models which spring to mind are Linn Keilidh/Index II, Epos ES11/14, Castle Chester, Ruark Templar/Talisman, Mission 753, SD3/4, . . . but already this list is longer than a shortlist ought to be. Advice, please.

Finally, the recording industry's apparent determination to kill vinyl means that I will have to buy a CD player. I haven't listened to any over the past few years, but my earlier memories are of a harsh, almost metallic sound which bordered on the unpleasant. I'm sure matters have improved

Suitable separates for £800

Q I am currently looking at stepping into the separates market for the first time. After reading up on several makes and models I decided to visit Stereo Stereo in Glasgow. They were more than helpful and after telling them how much I wanted to spend (£800 approx) they got down to the task of selecting a few recommendations. They came up with the Arcam Alpha 3 amp, Arcam Alpha CD, and Castle Trent speakers. My other alternative is a system made up of a Sony CDP-X339ES CD, Sony TAF 440E amplifier and Mission 760 speakers. I would be

grateful if you could recommend any other options in the same price bracket and if you could give me some information on speaker stands.

John Larmour, Kilwinnig.

A The two systems selected appear quite sensible, and I see no reason to query the choices made. Although the Alpha 3 amplifier failed to shine against the competition of the day in our recent blind test, it is still a fine amplifier and does very well in systems like this. Make sure that you run in the Castle Trent's however, as they take many hours finally to settle down.

With regard to speaker stands, simply turn to our handy supplement this month, which will give you the lowdown on the best stands to suit either speaker.

Cartridge problems

Q I recently upgraded my record deck to a Linn LP12 Basik with Linn Akito arm, and because my faithful ten year old A&R A60 has no moving coil input, opted for a Linn K9 cartridge.

When listening to it via a pair of Spondor Prelude 2/2s, the music, particularly classical, is poorly focused, with instruments lacking separation and imagery. I do not feel that the K9 does justice to

since then, but where do I start auditioning? Am I likely to get a sound comparable to the LPT for under £500 (Rotel? Arcam?) or will I have to audition in the Meridian/Micromega class?

Ray Taylor, Bromley, Kent.

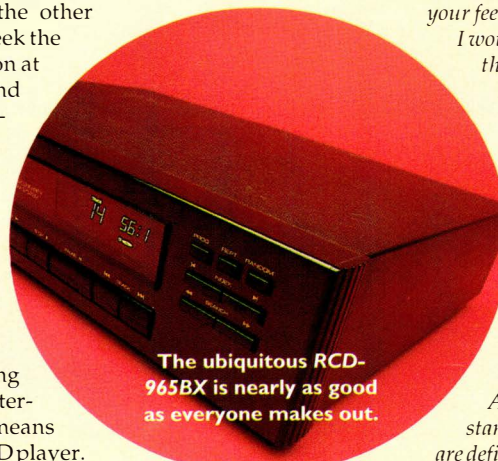
LETTER OF THE MONTH

**Isoda
Interconnect cable
winner**

A Given your amplifier, I would further limit your shortlist by removing the Linn Keilidh and the Epos ES14, as neither design seems a happy match with your amp. Also, I feel speakers like the Linn Index II and SD Acoustics SD4 would be rather outclassed by the others in this group, while the Ruark Talisman 2 may not suit your current equipment.

Of the five loudspeakers left, and given your feelings about early CD players, I would expect Mission's 753 to be the next for the early bath. You'll have to whittle the last four down for yourself, I'm afraid.

Many would say that you are unlikely to get a sound comparable to a decent record player no matter how much you spend on the CD player. Much of the harshness and brightness of the old days is gone, however, and players like the Rotel RCD-965BX and the Arcam Alpha Plus set a fair standard at this price level. There are definite advantages in going up to the Meridian 206ΔΣ class, but if your only experience of CD is with first generation players, both the Rotel and the Arcam should come as pleasant surprises.



The ubiquitous RCD-965BX is nearly as good as everyone makes out.

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What the press say

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WHAT HiFi, SEPTEMBER 1992

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HI-FI NEWS OCTOBER 1992



DENON

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HELP!

the rest of my system.

Can you offer a solution, comments or suggestions?

L F Parks, Oxted, Surrey.

A I can accept that the Linn K9 cartridge doesn't image brilliantly and has a limited ability to separate instruments, and it is also considered to be rather bright, but I find it hard to believe that it sounds musically defocused. Have you considered whether your speaker stands are up to the job of supporting the Spondors rigidly? Limitations here can often result in vague stereo imaging.

There are few options that we can readily suggest as an alternative to the K9 in this context, as you are limited to MM cartridges, or high output moving coils. Two suitable cartridges fall into that latter category. The £69 Denon DL110 cartridge is a superb all-rounder, while the (as yet untested) Sumiko Blue Point has a musical nature and a warmth that may well gloss over its slight lack of detail.

Tighten up

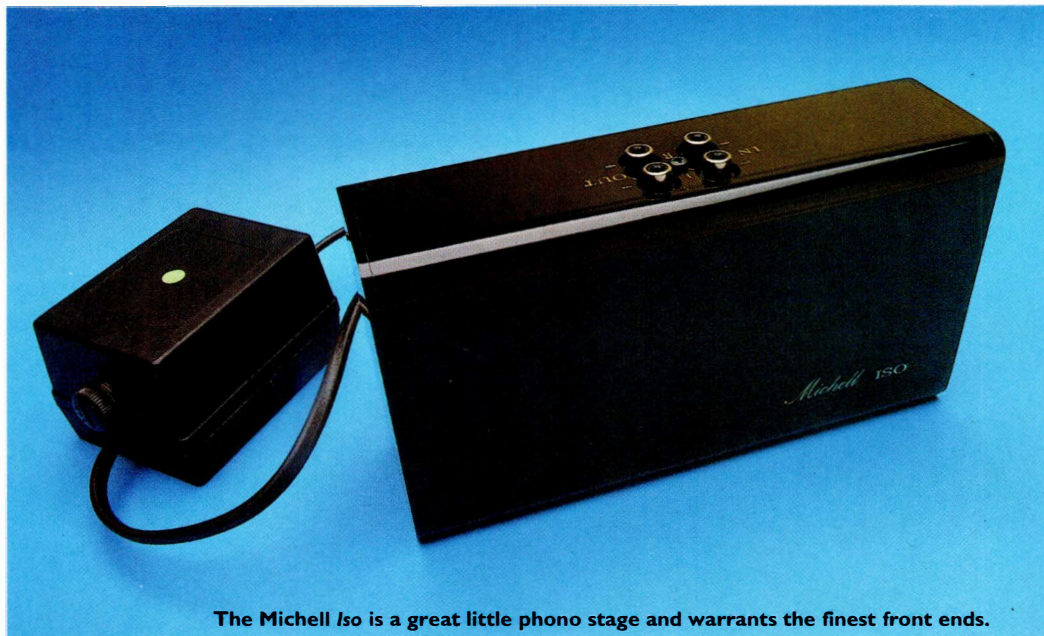
Q My system consists of a Michell Micro turntable, Rega RB300 arm and Audio Technica AT-OC5 cartridge, fitted on a Target TTW1 wallshelf. This is connected to a Mission Cyrus 2 amplifier, with PSX power supply. Finally, the loudspeakers are Cyrus 780s on Target S51 stands.

I want tight bass, that is not so boomy that it takes over the rest of the music. I would also like clean treble with good midrange, again tight with good detail and stereo imagery. I was thinking of upgrading the speakers, but am also considering a better cartridge, with a Michell Iso phono stage. I listen to rock music.

James Reid

Hairmyres, East Kilbride.

A So you want your system to sound even tighter then. No problem, get yourself a Mana Reference table and some heavy stands, these will significantly improve bass control and thus effective tightness. If you want to improve imaging listen to some of the better small speakers, such as the Rogers Studio 3 (£450), Epos ES11 (£330) and Rogers LS2a/2 (£220). As for a Michell Iso it's hard to say whether it would make sense to get one before you have upgraded the cartridge, or arguably the whole turntable.



The Michell Iso is a great little phono stage and warrants the finest front ends.

ble. A good phono stage such as the Iso makes a lot of difference, but the hierarchical approach would dictate that greater improvements would be wrought by moving up to a Gyrodek. I'd suggest you listen to an Iso and see what you think.

Exquisite high fidelity

Q My system consists of a Rotel RCD 965 BX CD player, Aiwa AD-F810 cassette deck, Denon TU-260L tuner, powered by an old Sanyo JA220 integrated amplifier. The speakers are left over from my old Aiwa XL8000 midi system and are surprisingly very good. However, after following the many reports on what is available from the huge variety of modern

top quality equipment, I am anxious to enter the realms of exquisite high fidelity.

My taste in music knows no barriers, as I listen to anything from old reggae, disco, jazz, soul and rock to classical. Also I listen to music at anything from very soft (low volumes) to earth shatteringly high levels. Hence, I am looking for an amplifier and speakers which will give me good balanced sound, stereo imaging; the works. I am looking for rich clean bass, midrange and high frequencies. I consider this accomplishment absolutely important and therefore I don't intend to cut corners. I am prepared to

Put these AN-Js with a Series 700 and revel in 'rich, clean bass'.



spend up to £2,000 on this upgrade.

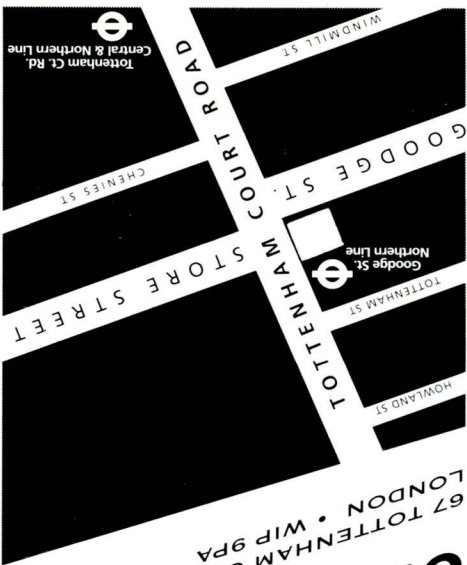
Courtney Swaby,
Grove Park, London.

A Spending up to £2,000 on the amp and speakers may prove too revealing for the good but rather humble Rotel CD player. If you are still going to leave the CD unchanged, however, try a combination like the Audio Innovations Series 700 line level integrated amp with a pair of Audio Note AN-J loudspeakers, matching stands, an equipment table and decent loudspeaker and interconnect cables. Such a combination blends together so well that it almost recommends itself, but the modest power of the Audio Innovations amp might be a limiting factor. More powerful transistor alternatives to consider include pre/power combinations from Naim and Exposure.

An alternative approach would be to upgrade the Rotel to a Meridian 206ΔΣ and look at mid-price integrated amplifiers like the Albarry PP1, Arcam Delta 290 and the John Shearne Phase Two, and mix to taste along with speakers of the Castle Chester, Linn Keilidh or Ruark Templar ilk.

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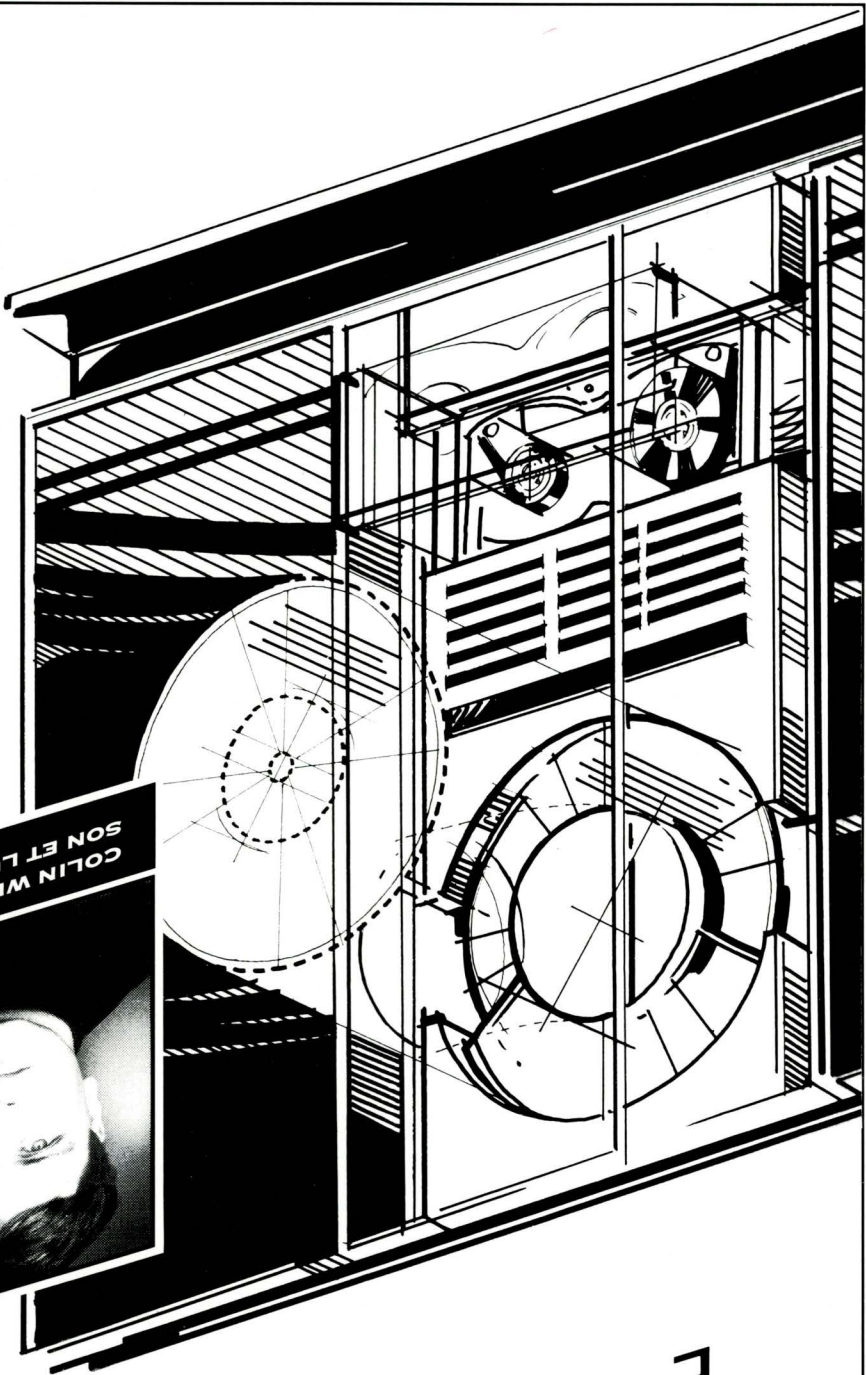
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SON ET LUMIERE

WRITE ON!

LETTERS EDITED BY LISA NICKSON

Rare sensations from a Choice CD

I've just spent a wonderful couple of hours listening to the gorgeous Edelweiss CD from the front cover of the April issue. To be so utterly transfixed by music with which I am mostly unfamiliar is a rare sensation. I'm the type who needs to listen a few times before I'm hooked on a particular piece.

The high spot of this CD for me is the stupendous bass on the Schumann organ fugue. It had both me and my Tannoy 603s scared stiff.

I was never more effectively reminded of the importance of good software. And of how good even a modest system like mine — Rotel RCD 965BX CD player, Ion Systems *Obelisk 1* and Tannoy 603 — can sound when fed quality signals. So much of the music available these days on both CD and LP is so poorly recorded that many of us must be spending fortunes on building and upgrading systems which give an ever more accurate presentation of total rubbish. Thanks for alerting me to the delights of real audiophile quality material.

Colin Beresford,
Billinge, Lancashire.

Dream dealers

About a year ago I finally got round to throwing out my old Sharp music centre (bought in 1974 for about £78). Having read several reviews I bought an Arcam *Alpha 3*, a NAD cassette deck and a pair of JPW *Sonatas* from Newcastle Hi-Fi. Later I added an Arcam CD player and a rather nice set of Linn interconnect cables.

What struck me then was the patience of Al, the owner of Newcastle Hi-Fi, in letting me mix and match and decide (by listening) just which combination I preferred. One thing that I noticed in particular was that when listening to speakers he always removed the previous speakers from the room.

I continued to buy your magazine, having become generally hooked, and have read with interest the various comments that followed the reorganisation by

A high price to pay

I attended the Bristol Show specifically to listen to the new Mission 753 speakers with the intention of purchasing a pair.

Having listened, and noticing a placard in the demo room advertising a ten per cent reduction on Mission speakers, I wandered around the rest of the exhibition to think about the cost.

Having decided to buy, I walked into one of the selling offices and asked for a pair of Mission 753s with the ten per cent discount, only to be told that the discount was only on Mission speakers and the 753s are Cyrus. I argued that the speakers had a Mission label and that *Hi-Fi Choice* says it is a Mission speaker. However, they insisted that these speakers are Cyrus and didn't carry the discount.

I decided to buy them anyway, even though I didn't want to pay the full cost of £600. I was then told that they in fact cost £700, well £699.90, although they are advertised in *Hi-Fi Choice* and others at £599.

After further thought I de-

cidated to buy them but have the feeling that I was 'misinformed' by advertising to say the least and my projected cost of £599 less ten per cent making £540 escalated to £699, an increase of £150.

I wonder whether there will be a Mission or Cyrus label when they arrive.

Linn of its dealer network. I recently went into a different hi-fi shop — no longer Linn dealers — and saw a man auditioning a set of speakers in the middle of the crowded sales area. While he was doing this other customers were stepping past him, standing in front of him, some were even having their own auditions in other parts of the very noisy shop. The speakers in question were just one among about six pairs that were arranged along the wall.

I suppose that this could be the best way to audition hi-fi as, let's face it, if it sounds good in that situation it can sound good in any other. However, I have to come to the conclusion that perhaps Linn is not totally wrong in demanding a high standard of customer service from its retail outlets. It would surely improve matters for every-

one, particularly the inexperienced purchaser, if other high-end companies did the same.

Andrew Makin, Gosforth,
Newcastle-upon-Tyne.

LETTER OF THE MONTH

Hi-Fi Choice
sweatshirt Winner

When is a Mission not a Mission? When it's a Cyrus, apparently, although we always

thought the 753 was a Mission model, and have seen it being built in the Mission factory. The root of your unfortunate experience is of course the laws of supply and demand. The 753 is a 'hit' product, so no one's offering discounts, and Mission has been able to stick £100 on the price as well.

One of the most exasperating but by no means unusual experiences for any reviewer is to hear that his/her carefully considered value judgments are scuppered by a price rise immediately following the publication of a favourable review.

As supplied by the patient Al of Newcastle Hi-Fi, the JPW *Sonata* continues to be a fine budget box.



Relative Best Buys

I wonder if you would answer the following question for me. Does a rating of 'Excellent' mean that an item is excellent irrespective of price or is it excellent only in its price class. That is, if I pay £1,000 for an item rated 'Average' could it in fact be better than one rated 'Excellent' priced at only £200.

J Kotwal, Zurich, Switzerland.

Our ratings attempt to be absolute judgements, disregarding price considerations. Note, however, that they are also gross over simplifications, and that a collection of 'Excellent' components will not necessarily create an excellent sounding system.

Comments on the revamp

Well you asked for some comments on the new layout, so here goes.

Choice Sessions, very good for variety and presentation but, oh dear, those little verdict boxes!

Statements as always, leaves the tongue flapping aimlessly in mid air and I'm still not quite sure about *Aspirations*, am I supposed to drool over the hi-fi or the homes?

Last, but definitely not least, the monthly reviews. I'm not sure about the new one page layout divided equally between copy, photograph and technical data which seems to leave less room for comment. I notice (actually for the first time) that the review pages represent a relatively small percentage of the total magazine — I am not suggesting more reviews, just simply that they, of all things, need not be compressed to conserve the world's natural resources. Incidentally, while on the subject, I find the system reviews particularly interesting and in many ways far more informative about how equipment behaves in a more homely environment. It seems to be unique to *Choice* and is certainly a format worth developing.

You have an excellent magazine but remember readers also like to hear about equipment that kicks ass for a tenner.

Mike Jenkins, Grove Park,
London.

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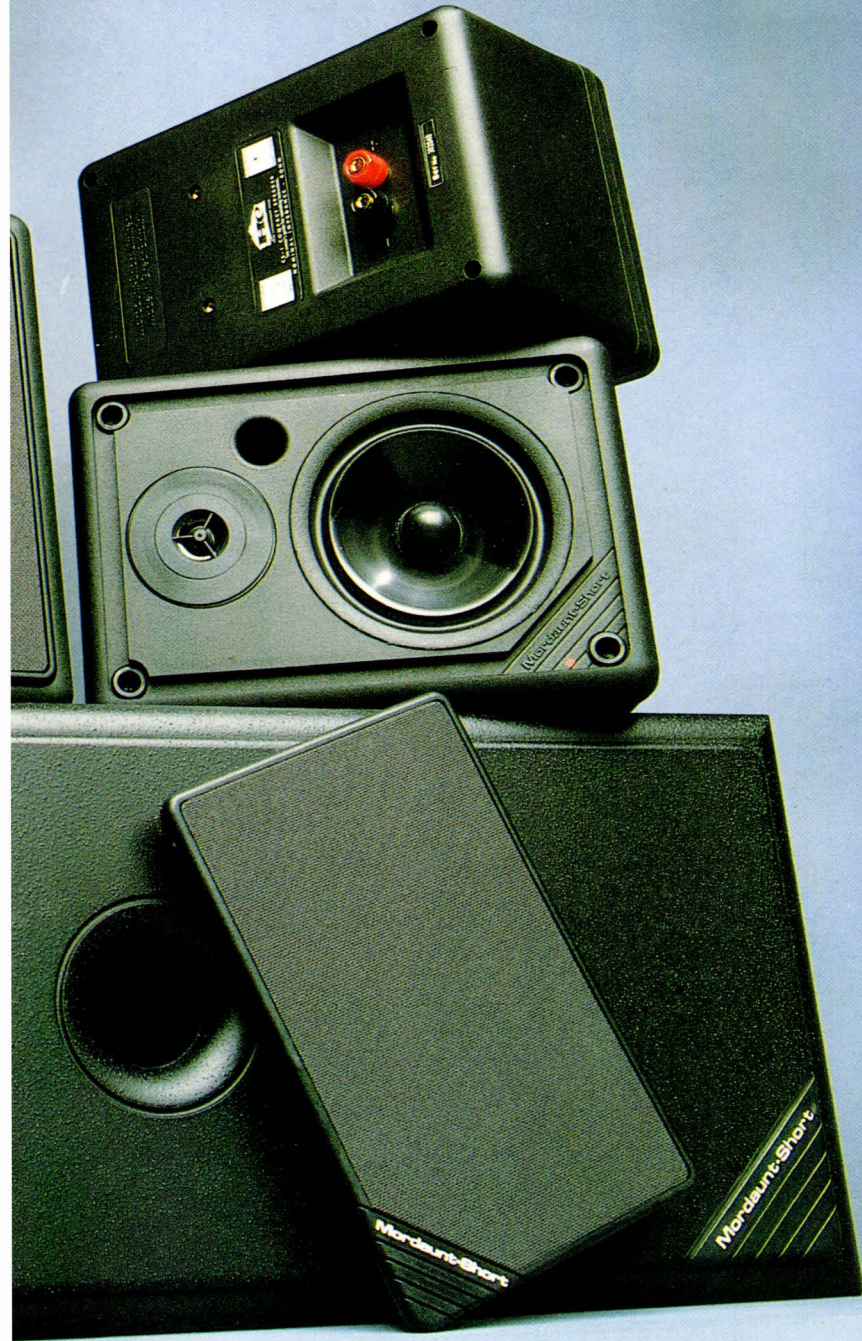
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Questions

1. Which CD player uses letters from the Greek alphabet in its name?
2. What is the name of Linn's new modification package for the *LP12*?
3. Which Mordaunt-Short speaker is "Lots of speaker for your money"?
4. How many FBA awards did Audiolab pick up this year?
5. Which CD player is famous for its K2 retiming circuit?
6. How many DACs are in the Accuphase *DC-91* processor?



Entry form

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- 1) All entries must be on the entry forms provided. Photocopies will be accepted. Incomplete forms will not be considered. Only one entry per reader please!
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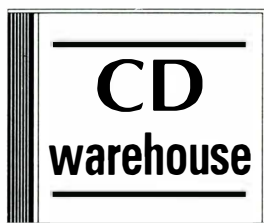
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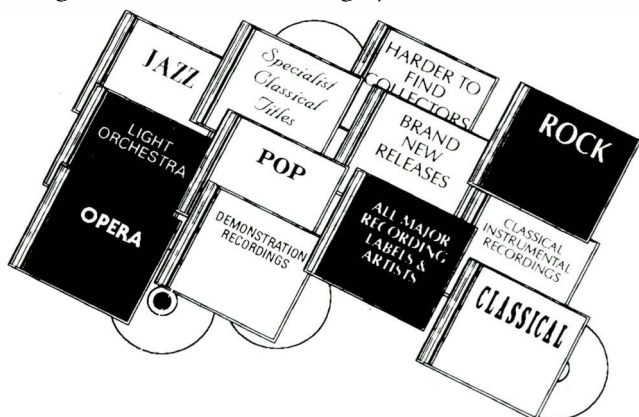


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Grim future for video sound?

In the early days of home video everyone was so busy squeezing several hours of moving colour pictures into a pocket-sized cassette that sound quality initially took a back seat. Then came Hi-Fi Stereo video, recording an FM format stereo soundtrack along with the picture signals. Laservision started out with FM stereo sound, then changed name to Laser Disc and switched to 16-bit CD quality digital stereo sound. The UK's Nicam terrestrial television transmission system also gives excellent stereo sound, and all three cope well with Dolby surround, because they have coherent phase response.



Barry Fox finds that both satellite and Full Motion Video companies can be 'phased' by Dolby sound.

In the early days of surround sound, there were problems with the DBX noise reduction system then used on some tape recorders to reduce hiss. If the signal from a DBX encoder was fed to a surround system, phase errors from noise decoding fooled the surround decoder into steering signals into the wrong direction. Dolby noise reduction is good on phase coherence, and Dolby has always run a very tight policing scheme which ensures that all equipment bearing the Dolby trademark meets the system specification. Today around ten million people now own Dolby Pro Logic decoders, which are now selling at a rate of around two million a year, built into all sorts of kit.

The Astra satellite uses a system called Wegener Panda, to put noise-reduced stereo onto the sound subcarriers. Although there is nothing inherently wrong with the Wegener system, the company does not police its licencees as rigorously as Dolby. Some domestic stereo satellite receivers give good phase coherence, but others use poorly implemented

Phase is important because Dolby surround is a matrix system which buries surround information in the stereo pair by altering the relative phase and amplitude of the front and rear channel signals, and no matrix system can completely unmix front and rear, left, centre and right, just as you can never unscramble an omelette. Dolby Pro Logic analyses the decoded signals and steers them to accentuate direction, but any error in the decoding will be emphasised by the steering circuits.

Wegener circuitry or pseudo-Wegener circuitry, and put phase errors into the stereo. When fed through a Dolby Pro Logic surround decoder, the sound may wander between loudspeakers.

Clever picture tricks — but what about the sound?

The video and TV industries are currently forging ahead with plans to use compressed digital video, either for recording Full Motion Video (FMV) onto CD size discs or for broadcasting digital TV. The standards controlling this are set by the Motion Pictures Expert Group of the International Standards Organisation and are known as MPEG-1 for the low data rates (up to 1.5 MBit/s for CD), and MPEG-2 for the higher rates (4 MBit/s and up used for broadcasting).

And, would you believe, everyone has got so excited about the clever picture tricks that they have forgotten about the sound.

Early this year I got a tip that FMV/MPEG stereo would not work with Dolby Pro Logic, but I could find no-one who had actually tried running Dolby surround from an MPEG disc through a Pro Logic decoder.

"We are sure there will be no problem, and someone must have tried it" was the usual response. Eventually, one Philips source admitted "No, not possible in the present FMV standard". The MPEG/FMV audio standard is based on the Musicam system developed for digital audio broadcasting, as is the PASC compression system used by DCC (Digital Compact Cassette). But MPEG audio encoding is not the same as PASC.

PASC was developed exclusively for DCC, but the MPEG standard is broader in scope than the refined PASC/DCC standard. MPEG, for instance, only standardises the format in which the data is recorded or transmitted and the use of 32 sub-bands, and does not fully specify the coding process.

Tests now run by Philips labs at Redhill, apparently as a result of my stirring, have produced more encouraging results. Surround sounds appeared to be coming from the right directions, but with less overall spread — from inside the speaker ring, rather than outside it, as happens from a higher quality source.

It thus looks as if the way an FMV decoder copes with Dolby surround may well depend on the type of encoder used to make the source material, and whether the coding controls bit allocation in a way that ensures phase linearity. If no-one gets a grip on the situation, it may be pot luck whether FMV material decodes into accurate surround-sound.

And how odd that it takes the press to get the question looked at. If Philips had launched FMV last autumn, or this spring, as previously planned, sales would have begun before anyone thought to check the surround sound performance . . .

Choosing and Using CD Players

Ten years on and the little silver disc continues to supplant the conventional vinyl LP in the mass market, and although the cost of the discs themselves is just about beginning to show the first signs of slipping, the price of the Compact Disc players has tumbled year after year. Now it is possible to choose from a whole clutch of perfectly adequate machines costing no more than £130, which is less than the cost of a dozen discs.

Spending an extra £30-£50 brings in fully-fledged name-brand budget models offering advanced features alongside the very latest in digital technology. Players are unlikely to become appreciably cheaper, at least in the short term. Instead the technology and facilities available at each established price point will be steadily upgraded.

So what can be expected from a decent budget CD player these days? Featurewise you are spoilt for choice, with full remote control supplementing a broad range of facilities already incorporated on the player itself. Basic track location, fast music search, repeat and program play options can be taken for granted, while other features like tape edit (fitting selected tracks onto predetermined lengths of tape), peak search (an invaluable aid when setting the record level), random play, index selection and variable outputs still creep in on some players below £200.

Some of the more expensive players come with still more elaborate facilities, including non-volatile memories which are used to recognise favourite tracks or index points from many tens or hundreds of different Compact Discs.

Build quality also improves while progressing from the budget £160-£200 models to those pitched at £250 or more. Plastic mouldings are replaced by alloy fascias and the casework is reinforced with extra struts and more substantial metalwork. These factors, along with separate mains transformers for the digital

and analogue circuits and beefier CD transport mechanisms, can increase the weight of the player several times over. So they 'feel' like good value, even though a less substantial player may be no less reliable in reality.

What of the technology trends? It might be expected that paying more money will buy more advanced technology. In practice, however, it's much more likely to pay for a more elaborate and expensive implementation of the same basic technology used in all players.

The most important technical change since CD was first introduced happened about four years ago, when so-called 'bitstream' convertors were introduced as an alternative to the 'multi-bit' convertors that had been universally used since the format's inception.

Although the early bitstream players carried a price premium, this approach is actually rather less expensive from the point of view of manufacturing quality control, so bitstream players soon appeared at beer budget prices, and nowadays multi-bit convertors are the exception rather than the rule, largely restricted to upmarket specialist machinery.

Whatever the conversion technology, there's no need to fret over the relative compatibility of different CD players. Regardless of the internal architecture, each and every machine must still conform to certain agreed standards. So every

Compact Disc player will play the standard 12cm silver disc, will offer the same basic track skip, pause and stop facilities and will merely require to be connected to an amplifier line input. Never connect a CD player to an input market 'phono' or 'disc' on your amp, but choose instead any line-level connection such as aux, tuner, tape or, indeed, one marked specifically for CD.

Universal compatibility is therefore assured. But sound quality? That's another matter altogether.

Swing tags

Products that make the grade are awarded the Best Buy or Recommended accolade.

A product carrying the Best Buy swingtag is of excellent quality and good value for money in its price category.

Recommended products are runners up, but still definitely worth considering within their price bands.





How CD works

The biggest problem in understanding how a CD player works boils down to not being able to see the direct relationship between the shiny disc at one end of the system and the music which emanates from the other.

A Compact Disc is covered with billions of microscopic pits arranged in a spiral running from the centre toward the outer edge. It rotates at a speed which varies from about 450 revolutions per minute at the beginning down to as low as around 250 rpm and the information is extracted by reflecting a beam of laser light.

As the CD rotates, the spiral of bumps passes under the beam, and the light bounces back onto a device called a photodiode. The light returning from the surface is seen as either in- or out-of-focus, depending on whether it is reflected from bumps or the flat areas between them.

The photodiode changes the pulsating light into a continuously-fluctuating electrical current which is then sent into a buffer/decoder section. At this point any errors and dropouts which might have occurred due to minor scratches, fingerprints and particles of dust are corrected. To help the CD player overcome scratches and the like, the data is jumbled up before it is put onto the disc so that a scratch or other defect will not wipe out an entire section of music. During the error correction process the data stream is re-assembled and re-ordered.

The cleaned up data stream's next stop is a device known as a digital-to-analogue converter (DAC), which turns it back into a recognisable analogue music signal. Sometimes the converter is housed in a separate case,

known as an outboard DAC, which is driven by the CD player's digital output socket. This sort of arrangement can give a better sound as the CD player and DAC are fed from separate power supplies, however there are disadvantages in that the transmission of data between the two boxes can be less than perfect.

There are various types of DACs, multi-bit and Bitstream being the most common, although a number of other systems exist. Both approaches have their acolytes, but at the end of the day the type of DAC employed is not necessarily the final arbiter of sound quality.

Whichever approach is used, the DAC finally converts the digital datastream into a continuous analogue signal just like those produced by a turntable, tuner or tape deck, ready for the (analogue) amplifier and speakers.

Blind Listening

For comparative reviews, *Hi-Fi Choice* puts components through our own rigorous testing procedures. Central to this is the blind listening test, that uses a panel of listeners who are unaware of either the name or the price of the individual product. These components are precisely level matched, to eliminate preferences due to differing volume levels. Objectivity is further ensured by our lab measurements which are always our own, and are not swayed by the claims of manufacturers.



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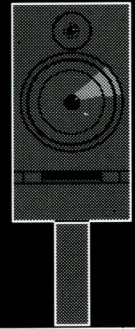
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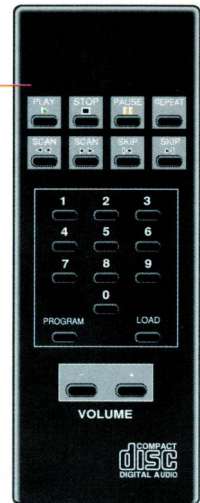
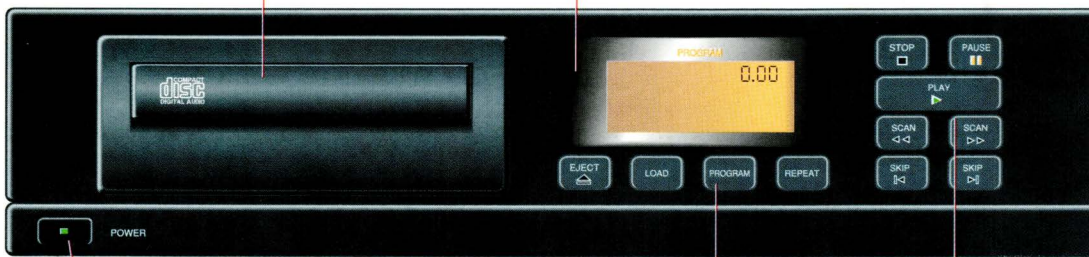
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The disc drawer loads the disc, that then sits on a centre spindle for reading by a laser on a swinging arm underneath the disc. Unlike vinyl LP, the polycarbonate CD rotates anticlockwise at speeds of up to 500rpm. Most discs are loaded into a drawer label side up, although there are top loading transports, together with a few 'CD turntables' that support the entire disc and read from above.

Displays vary from the spartan to the over-informative, but all have the ability to display the track number, elapsed time of the track being played and usually some indication of what action the machine is currently performing (such as play, pause, or error). In many machines, the display can be dimmed or even switched off completely.

The remote control handset can be as minimalist or as feature-laden as the player itself. At the very least it will offer basic track finding and scanning controls, sometimes with drawer open/close. At the other extreme, some players leave the front panel of the CD devoid of controls, assigning nearly all features to the handset



There is some controversy over leaving CD players constantly powered. Some audiophiles feel that the circuitry within a CD player takes time to stabilise after switch on and, as a quiescent CD player draws little current, recommend it is left on constantly.

It's possible to rearrange the track listing of a CD by means of its program button. Some players take this further by memorising favourite tracks on particular discs. Other features can include phase inversion, peak search (for overload-free tape recording), and random play to juggle the track order completely.

The logic controls are very similar to those of a cassette recorder, without the recording facility. The scan facility allows the listener to fast forward and reverse through an individual track, while the skip buttons move from track to track. Many CD players will also have a row of numeric buttons for even easier direct track access.

Tech Talk

Hi-Fi Choice uses a panel of experienced listeners to evaluate each CD player under blind conditions. Every player is thoroughly warmed-up and level-matched to within a fraction of a decibel, then auditioned separately in a fixed reference system, consisting of Silver Sounds interconnects, Deltec 100S pre/power amps and Audio Note AN-J loudspeakers using a fixed programme of CDs.

Listeners' impressions are typed directly into a computer and are then read back to the panel and adjusted until they best reflect the collective opinion. Finally, the panel is informed of the player's price so that value judgements can be formed, which, tempered by build quality, lab performance and facilities, forms the basis of our Recommendations and Best Buys.

The Measurement Programme

Unlike analogue audio signals, the quieter the sound in a digital system, the more distorted it becomes. Most CD players will therefore give their best results at 0dB (peak level). Figures for harmonic and intermodulation distortion are provided in each table, the former taken at decreasing levels from 0dB to -90dB (dithered), showing the DAC's linearity.

The resolution error of the DAC is written as the difference between the level expected and that obtained.

Distortion is most graphically portrayed on the 3D plots that accompany the reviews, which show a complete audio band sweep over the full dynamic range. Many plots will also reveal two V-shape tracks either in full or in part, which are sampling images or aliasing distortions.

Noise modulation is also a reflection of quantisation errors, which accumulate as noise covering the entire audio band. This is tested by forcing the DAC to step up or down by one LSB. Any difference in the size of these LSBs increases background noise, the +dB figure quoted in the text.

D/A converters

It is possible to upgrade a Compact Disc player without having to trade it in or attack it with a soldering iron. A large aftermarket in separate digital to analogue converters has emerged, to allow for the regular improvements in digital electronics.

The function of the D/A convertor (DAC) is simply to process the binary information stored on the disc and convert it into the analogue audio signal recognised by loudspeakers and ears. Make sure, however, that both transport and DAC use the same digital socketry; the most common are the electrical (or coaxial) connection, which uses a single conventional phono plug lead, and the fibre-optic Toslink interconnect, which doesn't.

At lower levels other problems come to the surface — hence the 1kHz plot taken at -70dB, now a dithered signal. This clearly shows the type of DAC being used. Bitstream DACs, for example, generate considerable ultrasonic noise, and this may interact unpredictably with different amplifiers.

Be warned, these plots should not be taken as a definitive guide to the absolute quality of the CD players, because this is simply not the case. Rather, the 3D and 1kHz/-70dB plots provide 'fingerprints' of the oversampling filters, noise-shapers and DACs that are employed in each player.

Clues like these plus the laser mechanism, power supplies and final analogue electronics, together with the unpredictable influence of RF noise are all pieces in a very complex subjective jigsaw. Little by little, as more pieces become available, the overall picture starts to come into focus.

Most CD players adhere to the nominal 2V peak output standard, though some manufacturers increase this in order to gain an advantage during in-store demonstrations. Always bear in mind that the loudest CD player is not necessarily the best.

Aiwa XC-750



Way back in issue 95 Aiwa's XC-700 demonstrated the danger of harbouring preconceived notions, as our listeners awarded a Best Buy to what looked, superficially at least, a rather mundane and lightweight player. It was only after the technical dissection that the 700's true strength emerged, for this was the first player under £200 to be fitted with Philips re-nowned Bit Stream digital-to-analogue converter.

Now, two years later, Aiwa has launched a player evidently based on the 700, but the £180 XC-750 has a gentler and more luxurious appearance. Gone are the clumsy transport controls to be replaced by fingertip buttons catering for the various program, random and repeat play options.

In addition to its automatic and program tape edit functions, Aiwa has also

included both peak-search and calibration tone facilities, which not only locates the loudest portion of any CD but also generates a maximum level calibration tone for presetting the tape recording level.

Sound quality

"Flimsy", blurted out one member of the panel, "an insubstantial sound, lacking muscle and possessing all the momentum of a runaway roller skate". To be fair the XC-750 has a very open and spacious sound, but this has a filmy and diaphanous rather than a solid and substantive quality, described as a large cloud of music "that would have vanished had someone sneezed".

The bold dynamics of a close-miked piano or vocalist prompted further strong criticism of a hardening that alters tonal colours and also the temporal relationship

between accompanying performers. Yet despite its problems with large scale dynamics, the music can remain clean and clear, unrudded by edginess from brass or vocal sibilants. As a result, although the foundation to Prokofiev's *Romeo and Juliet* was sadly diluted, what remained was neither wispy nor shapeless. The overall sound is not unattractive, but it lacked the gift of commanding attention.

Conclusion

The difference between a sound that is fundamentally natural, fluid and effortless, and one that seems polite but is also somewhat tedious is obviously a fine one, for this is the divide that separates the old XC-700 from the new XC-750. Whatever technical revisions have been made, somehow part of the original spark of magic that once made a Best Buy has slipped away.

Contact

AIWA UK LTD, UNIT 5
HEATHROW SUMMIT
CENTRE,
SKYPORT DRIVE,
WEST DRAYTON,
MIDDLESEX UB7 0LY

081 897 7000

Verdict

- +** High technology at a low price, excellent features.
- Sounds weak and insubstantial compared to the XC-700.
- ▶** £180.00 RRP

LAB REPORT

Determining any significant change between the older XC-700 and this XC-750 is tricky because the measured performance of both is determined by the NPC SM5840 oversampling filter and SAA7350 Bit Stream DAC. So the 3D plot highlights the NPC's fingerprint of stop band noise (V patterns), just as the -70dB plot shows the benefits of running Philips third order noise-shapers (in the SAA7350) at a higher 16.9MHz clock frequency.

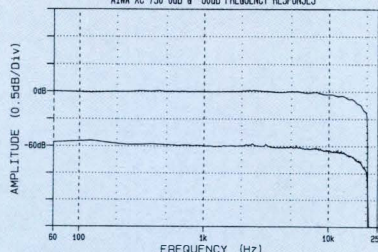
This technique increases to 384 times the compound over-sampling rate, compared to the 256 times adopted by Philips and Marantz, which decreases the level of ultrasonic noise by a good 25dB at 80kHz.

A lone third harmonic dominates the THD spectrum from -20dB to -90dB at midrange frequencies although 0dB distortion has been reduced from the 0.0045 per cent of the XC-700 to 0.0027 per cent in this XC-750.

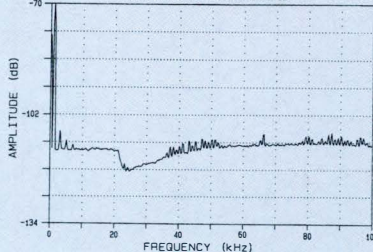
TEST RESULTS

	20Hz	1kHz	20kHz		950ohm
Channel Balance	0.08dB	0.08dB	0.04dB		10mV @ 8-40MHz
Channel Separation	113.4dB	98.3dB	73.7dB		+5.6dB
THD vs Level, 0dB	-95.6dB	-91.3dB	-74.6dB		-85.2dB
-30dB	-80.2dB	-77.2dB	-74.8dB		61.2dB
-60dB	-45.4dB	-43.7dB	-44.5dB		0.00dB
-80dB	-22.1dB	-26.2dB	-23.6dB		+0.01dB
Dithered, -90dB	-13.1dB	-21.8dB	-16.6dB		-0.18dB
Dithered, -100dB		-18.1dB			106.1dB
Dithered, -110dB		-1.75dB			106.9dB
Resolution @ -60dB		+0.06dB	+0.01dB		105.3dB
-80dB		+0.90dB	+0.31dB		Optical
-90dB		+2.15dB	+0.68dB		+88.8ppm
-100dB		+2.40dB	+2.70dB		5secs
Peak Output Level, L			2.452V		£180
R			2.431V		
Relative Output Level			+1.73dB		
Output Impedance					
Radio Frequency Spurious					
1Hz Noise Modulation					
CCIR IMD, 0dB					
Suppression of stop-band IMD					
De-emphasis Accuracy, 1kHz					
5kHz					
16kHz					
S/N Ratio (A-wtd), w emp, 0LSB					
w/o emp, 0LSB					
Digital Output					
Crystal Clock Accuracy					
Track Access Time (99)					
Typical Retail Price					

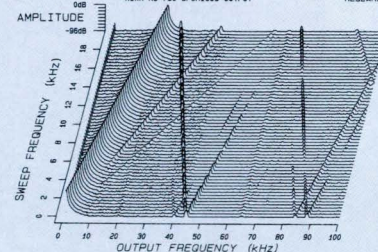
AIWA XC-750 0dB 6-60dB FREQUENCY RESPONSES



AIWA XC-750 1kHz @ -70dB DITHERED



AIWA XC-750 SPURIOUS OUTPUT



Marantz CD-52II



Had everything gone to plan, our review of the widely-publicised £230 Marantz CD-52II would have appeared in issue 112. Instead, our blind listening panel readily identified what turned out to be a rogue sample — one of several, I might add, that had passed unnoticed through the hands and ears of other hi-fi magazines . . .

This time around we've got the real McCoy, a player that's quite obviously based on the original CD-52 (issue 100) while benefiting from a series of subtle, internal upgrades. So, there's the same black plastic fascia, blue-tinted fluorescent display and comprehensive complement of play facilities.

Inside, Marantz has retained its established mother board but has incorporated several modifications originally devised for the £280 CD-52SE (issue 107), including a

new Black Gate electrolytic in the digital supply, a rubber grommet to damp the 11.3MHz crystal oscillator, and NJM2114 op-amps, decoupled with four Silmic capacitors, in place of the Signetics originals.

Sound quality

Having previously acclaimed both the CD-52 and CD-52SE for "full-blooded, hearty and vibrant" music-making, the very same crew of listeners showed a little more restraint in their enthusiasm for this 52II. The sense of scale, freshness and crispness gave all but the most melancholy music extra authority, and vocals had a breathy, chesty quality, adding a splash of colour to the atmosphere and authenticity of the music.

Individual instruments sounded realistic enough, but questions were raised over its sense of depth, especially as

Arnold's *Violo Concerto* sounded slightly obscure and flat, the player rather losing its way through the distant meandering of strings and woodwind. "Almost", suggested one panellist, "as if the music sets the pace and the player lags unhelpfully behind".

Yet the very definite structure of a Jennifer Warnes' pop track snapped the CD-52II back into life and redirected our ears back onto the music at hand. Sticking to busier, livelier selections of music, this player proved consistently entertaining.

Conclusion

In some respects this version of the near-classic CD-52 is not the all-singing, all-dancing party animal we had been led to expect. Instead it is a variation on a proven theme, obviously deserving formal Recommendation yet falling a whisker short of Best Buy status.

Contact

MARANTZ HI-FI UK LTD,
KINGSBRIDGE HOUSE,
PADBURY OAKS,
581 BATH ROAD,
LONGFORD,
MIDDLESEX UB7 0EH

0753 680 868

Verdict

+ Plenty of colour and lots of detail to tickle the ear with.

- Lacks depth and a true feeling of spaciousness.

▶ **£230.00 RRP**

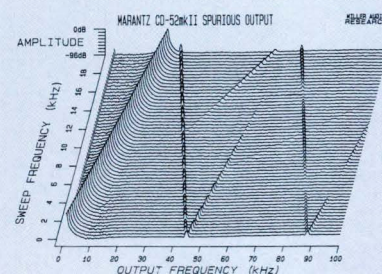
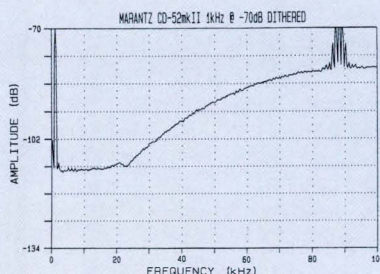
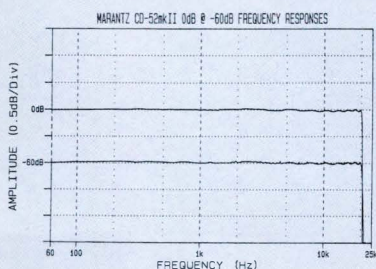
LAB REPORT

Once again this player uses Marantz' preferred combination of NPC SM5840 eight times oversampling filter sandwiched between Philips' SAA7310 decoder and SAA7350 Bit Stream DAC. And once again, the essential fingerprint of the player remains quite unchanged. Even the four Silmic capacitors that were inadvertently substituted during the production of our earlier sample had little influence over its basic technical performance.

Consequently any variation that does exist between these results and those of other related Marantz players are probably caused by mass production tolerances. Here THD has improved from typically 0.002 to 0.0009 per cent at 1kHz, while the wide 102.5dB S/N ratio and high +1.2dB output level mirror the old CD-72. Yet the flat frequency responses, partly submerged 3D plot and characteristic -70dB trace could have come from any of its immediate family.

TEST RESULTS

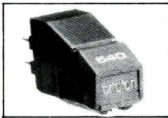
	20Hz	1kHz	20kHz		206ohm
Channel Balance	0.07dB	0.08dB	0.08dB	Output Impedance	10mV @ 80-120kHz*
Channel Separation	113.6dB	112.9dB	88.7dB	Radio Frequency Spurious	+3.6dB
THD vs Level, 0dB	-102.9dB	-101.1dB	-71.8dB	1Hz Noise Modulation	-99.6dB
-30dB	-83.5dB	-78.6dB	-48.7dB	CCIRIMD, 0dB	60.5dB
-60dB	-50.0dB	-45.1dB	-18.5dB	Suppression of stop-band IMD	0.00dB
-90dB	-26.5dB	-26.4dB	+1.80dB	De-emphasis Accuracy, 1kHz	0.00dB
-18.2dB	-18.0dB	+8.50dB	5kHz	S/N Ratio (A-wtd), w emp, 0LSB	104.7dB
Dithered, -90dB	-4.50dB		16kHz	w/o emp, 0LSB	102.5dB
Dithered, -100dB	+0.02dB	+0.02dB		w/o emp, 1LSB	102.5dB
Dithered, -110dB	+0.48dB	+0.44dB		Digital Output	Cosine
Resolution @ -60dB	+0.73dB	+0.96dB		Crystal Clock Accuracy	+29.0ppm
-80dB	+1.20dB	+2.95dB		Track Access Time (99)	3.2secs
-90dB	2.297V			Typical Retail Price	£230
-100dB	2.278V				
Peak Output Level, L					
R					
Relative Output Level					



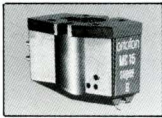
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NAD 502



NAD has remained resolutely opposed to the dictates, constraints and stereotyping of mainstream styling fads, and the new £200 502 CD player's traditional and rather primitive and plasticky matt-grey fascia is no more populated with features than its acclaimed 5425 predecessor.

Flexibility is now enhanced by a digital output on the player itself, and also (at last) a direct track access keypad on the accompanying remote handset.

Inside, the 520 is a revised and refined version of the 5425, fitted with close-tolerance polystyrene and polypropylene capacitors in the analogue signal circuitry plus polyester film and Luxon electrolytics in the central power supply. Extra regulation further isolates the various digital, analogue and servo circuits while NAD continues its careful defence against RF

interference by re-optimising the layout and decoupling its favourite bitstream DAC, in a series of subtle rather than wholesale changes that will undoubtedly influence the sound.

Sound quality

"A Mercedes style CD player" remarked a panellist in response to the dynamic, highly detailed but somehow rather teutonic sound. Compared to the sonority encountered with the 5425, the 502's music is delivered in a very correct, almost formal manner but one that's occasionally rather dispassionate. Mary-Chapin Carpenter, for example, sounded remarkably detailed but almost mechanical, her voice slightly forward and the piano faintly metallic in timbre, adding a crisp but cold air to an otherwise romantic ballad.

This proved a tricky player to summa-

rize, impressing our listeners with its technical competence — the sense of space, of detail and definition — yet perplexing them with its failure to bind these individual qualities together. A vivid jazz sax startled us with its immediacy, and percussion thrilled with its impressive sense of weight and scale, but the whole somehow failed to exceed or even reach the sum of its parts.

Conclusion

The listening panel's notes were almost universally positive, yet all were left with a nagging ambivalence, unable to reconcile its positive qualities with what was described as a "diminished sense of musicality". Perhaps NAD's pursuit of technical elegance has also watered down the colour, however spurious, that so excited us in the earlier 5425.

Contact

NAD MARKETING,
NAD BUILDING,
401-405 NETHER STREET,
LONDON N3 1QG

081 349 3240

Verdict

- +** A very precise sound from an unassuming package.
- There is not the integration or colour of the old 5425.
- ▶** **£220.00 RRP**

LAB REPORT

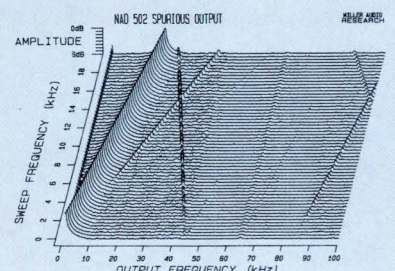
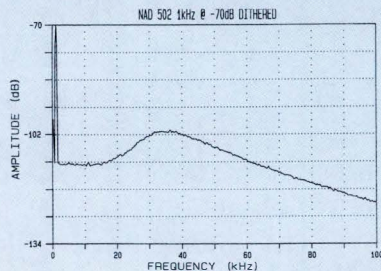
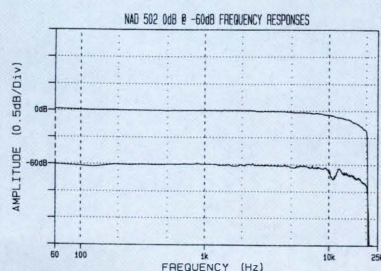
Compare these plots with those of NAD's earlier 5420/5425 player in issue 95 and the legacy is quite unmistakable. The single streak of stop-band noise (-81dB) on the 3D plot and customary 'blip' at 10.5kHz on its -60dB response are all hallmarks of the Technics MASH/PWM DAC even though the older MN6471 is exchanged here for a second-generation MN6474.

The same bitstream DAC is also found in the Technics SL-PS620A (issue 112), and comparing the respective -70dB plots shows the influence of NAD's 5-pole active filter in the swift attenuation of re-quantisation noise beyond 35kHz. Scrupulous filtering of this sort is certainly unusual but it also has the effect of reducing 20kHz distortion from a typical 0.018 to 0.009 per cent. NAD's mix of low distortion and excellent low-level linearity is to be applauded, even if its 'real-life' 99dB S/N ratio is still some 4dB behind the Technics spec.

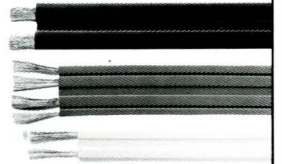
	20Hz	1kHz	20kHz
Channel Balance	0.10dB	0.10dB	0.16dB
Channel Separation	115.2dB	112.3dB	92.7dB
THD vs Level, 0dB	-92.0dB	-92.5dB	-81.0dB
-30dB	-92.2dB	-78.6dB	-68.2dB
-60dB	-58.8dB	-52.1dB	-40.3dB
-80dB	-28.1dB	-25.8dB	-20.1dB
Dithered, -90dB	-14.5dB	-17.2dB	-10.1dB
Dithered, -100dB		-11.1dB	
Dithered, -110dB		-8.20dB	
Resolution @ -60dB	+0.01dB		-0.02dB
-80dB	+0.02dB		-0.19dB
-90dB	+0.12dB		-0.80dB
-100dB	+0.10dB		-2.30dB
Peak Output Level, L	2.283V		
Peak Output Level, R	2.256V		
Relative Output Level	+1.10dB		

TEST RESULTS

Output Impedance	117ohm
Radio Frequency Spurious	1mV broadband +5.5dB
1Hz Noise Modulation	-88.7dB
CCIR IMD, 0dB	81.4dB
Suppression of stop-band IMD	-0.07dB
De-emphasis Accuracy, 1kHz	-0.01dB
5kHz	-0.07dB
16kHz	-0.21dB
S/N Ratio (A-wtd), w emp, 0LSB	110.9dB
w/o emp, 0LSB	108.2dB
w/o emp, 1LSB	99.0dB
Digital Output	Coaxial
Crystal Clock Accuracy	+45.0ppm
Track Access Time (99)	6.5secs
Typical Retail Price	£220



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Philips CD-920



Contact

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CROYDON,
SURREY CR9 3QR

081 689 2166

Verdict

+ Surprisingly restrained and civilised performance.

- Technically Philips has stepped back a few years.

▶ £150.00 RRP

Since more CD players are sold at or below £200 than above that price point, Philips, along with Far Eastern mass market rivals, is anxious to keep ahead of the budget sector game, offering five such bargain Bit Stream players, on paper at least. But all is not quite as it seems; four of them turn out, broadly speaking, to be cosmetic variations on a common theme.

This £150 CD920, for example, is little more than a CD692 in 900 Series livery, its hammerite grey fascia dotted with a series of clearly-marked controls for access to the 30-track memory, shuffle, intro scan, tape edit and repeat play facilities. Leave out the remote control and electrical digital output and the 920 is reduced to the status of CD910.

All four players are assembled in Singapore using a kit of parts which includes a

new three-beam linear-tracking CDM12 transport mechanism and an equally new budget CD circuit board. This uses the minimum number of components to get the job done, relying heavily on a new LSI which replaces some two or three original ICs.

Sound quality

The upshot of these technical developments is a surprisingly clean-sounding player, albeit one "lacking in substance or grunt". Carpenter's piano was described as "true and strong", even though her voice lacked the artificial, cavernous quality we had heard with other players, including the Marantz CD-52II. Instead Philips has engineered a cosy, smooth and sweet balance, for a player that sounds more understated than dynamically repressed.

Prokofiev's *Morning Dance* sounded

very tidy, an inoffensive but also rather academic interpretation. On simpler pop tracks voices sounded articulate, and the changes in emphasis between hard and soft notes was maintained as clearly as the interplay between sax and percussion on our jazz CD, even though the bass player was rebuked for "dragging his feet" on this latter track. Only on busier classical recordings are its foibles exposed, and its lightweight civility easily diagnosed as laziness.

Conclusion

Contrary to expectations this budget player is neither aggressive nor uncouth in its music making. Quite the reverse, in fact, for the CD920 was criticised more for sounding effete than bullish, by a panel of listeners who judged it "a pleasure" before urging Recommendation.

LAB REPORT

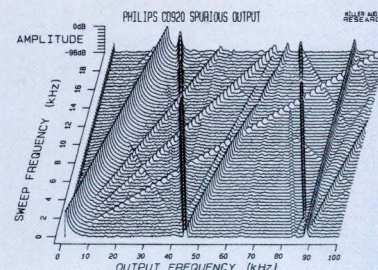
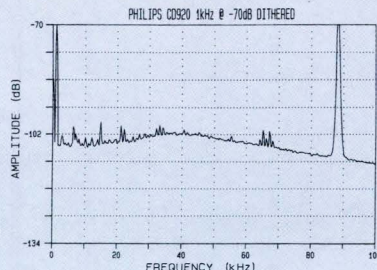
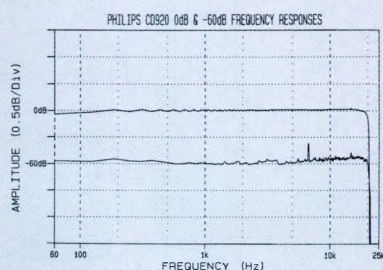
This is the first outing of Philips' SAA7341, a player-on-a-chip that combines decoder, 256 times oversampling filter, noise-shaper and Bit Stream DAC on a single substrate, to simplify the job of manufacture.

The oversampling filter lets through swathes of stop-band noise to pollute the 3D plot, along with large second, third and fifth harmonic distortions (typically 0.02-0.06 per cent). These residues prompt further IM distortion with the audio signals themselves, causing in-band products at typically -69dB.

A 'leaky' 2Fs signal (88.2kHz) looks equally troublesome, tracking its way up the 3D plot and dominating the -70dB trace. The CD920's relatively meagre 93dB S/N ratio is compromised by clusters of spurious tones above 3.6kHz, restricting both the dynamic range and the purity of the low-level frequency response, while the de-emphasis circuit is also wayward.

TEST RESULTS

Channel Balance	20Hz	1kHz	20kHz	Output Impedance	1.05kohm
Channel Separation	0.04dB	0.05dB	0.08dB	Radio Frequency Spurious	13mV @ 4.2MHz
THD vs Level, 0dB	65.9dB	109.7dB	77.9dB	1Hz Noise Modulation	+2.8dB
-30dB	-73.6dB	-73.7dB	-64.8dB	CCIRIMD, 0dB	-76.5dB
-60dB	-77.3dB	-73.1dB	-69.3dB	Suppression of stop-band IMD	15.6dB
-80dB	-46.8dB	-43.3dB	-40.1dB	De-emphasis Accuracy, 1kHz	+0.11dB
-90dB	-19.0dB	-16.3dB	-22.0dB	5kHz	+1.10dB
Dithered, -90dB	-15.0dB	-13.2dB	-11.5dB	16k	+1.32dB
Dithered, -100dB		-3.50dB		S/N Ratio (A-wtd, w emp, 0LSB	97.0dB
Dithered, -110dB		-1.50dB		w/o emp, 0LSB	94.6dB
Resolution @ -60dB		-0.08dB	+0.13dB	w/o emp, 1LSB	93.1dB
-80dB		-1.15dB	+1.13dB	Digital Output	Coaxial
-90dB		-0.75dB	+1.80dB	Crystal Clock Accuracy	-87.5ppm
-100dB		-0.50dB	+3.30dB	Track Access Time (99)	3secs
Peak Output Level, L		2.160V		Typical Retail Price	£150
R		2.176V			
Relative Output Level		+0.70dB			



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MARANTZ PM40SE	£299.95	£334.95	£349.95	£364.95	£399.95
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MARANTZ CD42II	89.95
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Sansui CD-X217



In reviewing three Sansui players over the last 18 months we have taken the opportunity to criticise its audacious claim to have 'devised a revolutionary D/A conversion system'. Neither is the £240 CD-X217 free of such hyperbole, for at its heart lies what Sansui describes as its 'exclusive MASH D/A convertor'. In practice this turns out to be the same MN6474 MASH/PWM DAC used in at least three other Sansui machines, and is one of the Technics bitstream family that regularly crop-up in CD players from Goodmans, NAD, Teac and others.

'Quadruple D/A converters' is a reference to the four 32 times oversampled PWM networks that are integrated onto the one chip substrate. Although not equipped with four discrete DACs, it does have a digital volume control that provides a reduction in level of 10:1, enabling

the player to be linked safely (but not necessarily usefully) directly to a power amp.

Technical whingeing aside, the CD-X217 is very generously equipped, its radiant orange display surrounded by a host of functions. There's even what appears to be a direct-coupled coaxial digital output which could service a future DAC upgrade.

Sound quality

Beware of first impressions, for this player offers no contrived sense of impact, but instead creates a subtlety and warmth that will undoubtedly grow on even the most cynical listener. Its key strength lies in a lack of edginess or glare on brass, strings or even the most daunting of female voices, giving a relaxed, flowing and comfortable sound, if one lacking realistic dynamics.

The sound is fuller but lighter, gentler and softer than the CD player norm, drawing Mary Chapin-Carpenter forward without her becoming any more distinct or 'etched' in its imagery. Similarly the rather distant recording of Malcolm Arnold's *Viola Concerto* was brought further into the room, where its sweet string tone was conveyed with a sense of compassion rather than nail-biting electricity.

Conclusion

The sound of the CD-X217, like the CD-X31 MkII, is warm, weighty but lacking in concrete solidity, another example of Sansui's 'house sound' — one which often fails to deliver the full and rich variations in musical dynamics but which is also tempered with a balmy serenity that's easy on the ear. As before, cautious Recommendation seems most appropriate.

Contact

SANSUI UK,
91 COLMAN,
LEICESTER
LE5 4LE

0533 460 021

Verdict

- +** The warm, comfortable, sweet sound of yore.
- Not a good player for the high-octane listener.
- ▶** **£240.00 RRP**

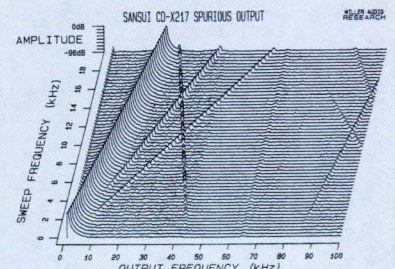
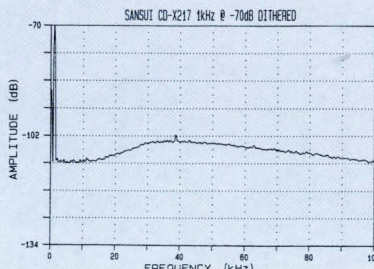
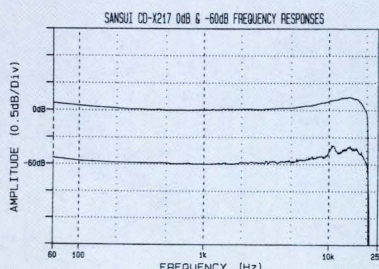
LAB REPORT

The CD-X217's true technical soulmate is the CD-X31 MkII covered in issue 100. Both have fairly primitive analogue stages that bring up the third harmonic track visible on the 3D plot, leaving the second harmonic and single streak of stop-band noise providing further evidence of the Technics MN6474 DAC. Even the +0.25dB treble boost is still interrupted by the characteristic MASH 10.5kHz 'blip' (see -60dB response) although the -70dB trace shows good control over the chip's ultrasonic output.

As with the 311, third-order IM distortion clocks in at a relatively high -70dB, and the 2.2kohm output impedance is very high indeed, equivalent to a 1.7dB (0.38V) loss of its 2.13V output when terminated by a 10kohm load, indicating that the 217 may be sensitive not only to the partnering amplifier but also to the choice of interconnect cable.

TEST RESULTS

Channel Balance	0.03dB	1kHz	0.05dB	20kHz	0.13dB	Output Impedance	2.16kohm
Channel Separation	101.3dB		90.7dB		63.3dB	Radio Frequency Spurious	17mV @ 51MHz
THD vs Level, 0dB	-82.4dB		-88.6dB		-72.4dB	1Hz Noise Modulation	+4.4dB
-30dB	-89.1dB		-77.4dB		-66.7dB	CCIR IMD, 0dB	-95.5dB
-60dB	-59.0dB		-48.8dB		-40.0dB	Suppression of stop-band IMD	82.1dB
-80dB	-26.7dB		-25.0dB		-19.9dB	De-emphasis Accuracy, 1kHz	+0.17dB
-100dB	-16.3dB		-17.1dB		-12.7dB	5kHz	+0.36dB
Dithered, -90dB						16kHz	110.1dB
Dithered, -100dB						S/N Ratio (A-wtd), w emp, 0LSB	106.1dB
Dithered, -110dB						w/o emp, 0LSB	96.1dB
Resolution @ -60dB						w/o emp, 1LSB	Coaxial
-80dB						Digital Output	+15ppm
-90dB						Crystal Clock Accuracy	4secs
-100dB						Track Access Time (S9)	£240
Peak Output Level, L						Typical Retail Price	
R							
Relative Output Level							

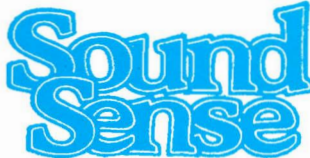




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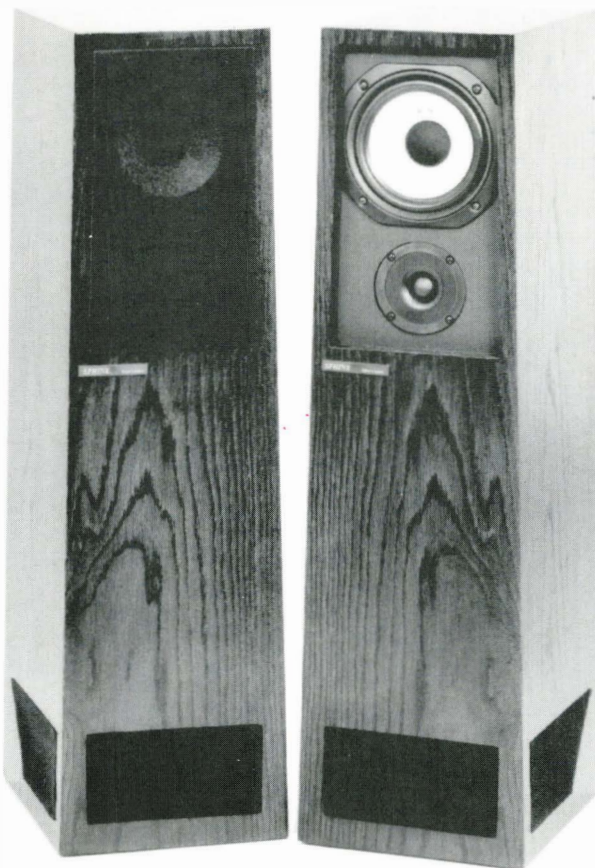
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Sherwood CD-3020R



UK sales of Sherwood products have hitherto been exclusive to the Richer Sounds chain of shops, which helps explain the very competitive prices, but also restricts countrywide availability somewhat. Accordingly Julian Richer has set up a new operation called Hi-Fi Direct to provide mail order distribution for Sherwood products with the intention also of supplying the brand via other retail outlets.

Construction of the £120 CD-3020R is hardly to battleship standards but its range of facilities, including a large IR remote control, is extremely generous given the very low price. Direct track access is provided on both player and handset, for example, while extras like program, repeat and random play plus auto-space (for tape recording) and intro scan are the icing on a particularly

charitable cake.

All Sherwood's CD players are equipped with what is described as Digi-Link connections, that synchronise the player with various other Sherwood separates.

Sound quality

By focusing upon the central theme or performer within a piece of music, the 3020R drew our listeners into a pool of sound, which takes some liberties with the music without ravaging its content. This is a very adaptable player whose shortcomings are very easy to accept, leaving little but the music to enjoy. We were overwhelmed by the emotive strength of Arnold's *Viola Concerto*, for example, even though on closer inspection it was neither as detailed nor as refined as with many other players in our survey.

Similarly, the atmosphere of Sadao Watanabe's jazz session seemed that much more tangible as we soaked-up the clubby ambience of this ancient recording. "You could almost smell the cigar smoke hanging in the air", one suggested, despite acknowledging the technical shabbiness of its sound. The 3020R is actually a rather untidy, freelifing player that, in the words of our listeners, "exudes a narcotic charm".

Conclusion

Evidently the overall performance the CD-3020R is very much greater than the sum of its parts, for in reality its parts are rather dilapidated. "Plenty of bugs", concluded our panel, "but strongly recommended at £160". Two days later Hi-Fi Direct announced that the price was reduced to £120, which was just the boost it needed to achieve a Best Buy rating.

Contact

HI-FI DIRECT,
202 LONG LANE,
LONDON
SE1 4QB
071 827 9827

Verdict

- + Ridiculously good sound and value at its low price.
 - Sound is rather untidy and cosmetically flawed.
- ▶ **£120.00 RRP**

LAB REPORT

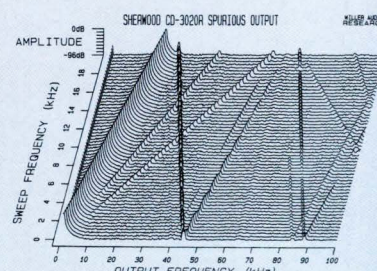
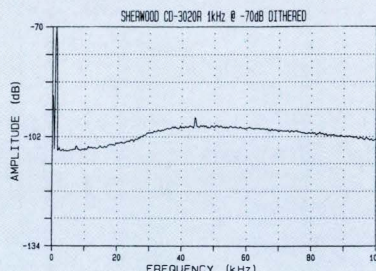
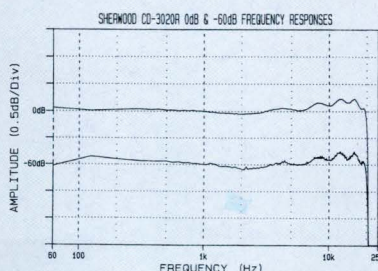
The various plots and figures that accompany this player give an opportunity to examine a new combined oversampling filter/bitstream DAC from NPC, the SM5871. The built-in noise-shapers are responsible for the modest 92dB S/N ratio and equally modest 15.5-bit dynamic range (see -70dB plot), while the main eight times oversampling filter stamps a series of ripples on the frequency response. This is also at the root of the bold (-32dB) stop-band patterns on the 3D plot and premature 0.55dB loss at 20kHz.

Distortion is uniformly high for a modern player, settling between 0.006-0.03 per cent at 0dB but reaching some one per cent at -60dB. Other quirks include highish third order IM distortion (0.03 per cent), rather high output impedance, slow track access and a huge clock error which amounts to a +8.4Hz offset at 20kHz. Just be thankful there's no digital output.

	20Hz	1kHz	20kHz
Channel Balance	0.11dB	0.10dB	0.02dB
Channel Separation	99.4dB	106.3dB	75.4dB
THD vs Level, 0dB	-85.2dB	-84.3dB	-70.2dB
-30dB	-77.3dB	-74.0dB	-63.4dB
-60dB	-46.5dB	-39.8dB	-34.8dB
-80dB	-21.0dB	-23.4dB	-14.2dB
-90dB	-9.75dB	-14.1dB	-5.50dB
Dithered, -90dB		-7.50dB	
Dithered, -100dB		-2.50dB	
Dithered, -110dB		+0.09dB	
Resolution@-60dB		+0.63dB	+0.07dB
-80dB		+1.18dB	+0.28dB
-90dB		+2.40dB	+0.68dB
-100dB		1.992V	+4.50dB
Peak Output Level, L		2.004V	
R		2.004V	
Relative Output Level		-0.03dB	

TEST RESULTS

Output Impedance	801ohm
Radio Frequency Spurious	3mV Broadband
1Hz Noise Modulation	+1.4dB
CCIR IMD, 0dB	-82.5dB
Suppression of stop-band IMD	31.8dB
De-emphasis Accuracy, 1kHz	-0.01dB
5kHz	+0.04dB
16kHz	+0.03dB
S/N Ratio (A-wrtd), w emp, 0LSB	103.0dB
w/o emp, 0LSB	102.8dB
w/o emp, 1LSB	91.7dB
Digital Output	None
Crystal Clock Accuracy	+417.5ppm
Track Access Time (99)	7secs
Typical Retail Price	£120



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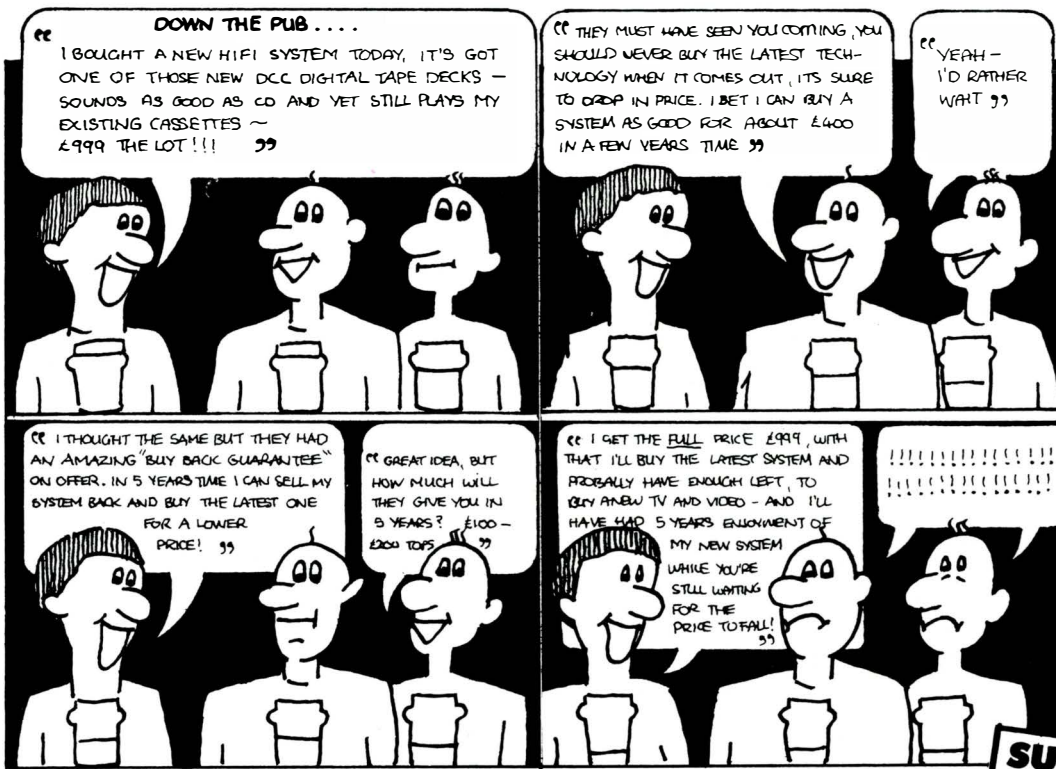
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Sony CDP-597



Contact

SONY UK LTD,
SONY HOUSE,
SOUTH STREET,
STAINES,
MIDDLESEX TW18 4PF

0784 467 000

Verdict

+ Well judged and entertaining, well equipped too.

- Unfortunately not as lush or rich sounding as possible.

▶ £180.00 RRP

The success of Sony's £180 CDP-597 might have been anticipated, after the way its 397 and 797 players had already collected *Choice* swingtags in previous issues (112 and 107). Naturally enough there's virtually no difference in the basic technology, all three sharing Sony's latest eight times oversampling filter and newish CXD2561 bitstream DAC.

Nevertheless this CDP-597 has very much more in common with the costlier 797, saving £20 by stripping off its alloy fascia, optical digital output and fancy remote control. This leaves a plastic-fronted player that's no less comprehensively equipped despite its anaemic-looking handset. There's even a motorised volume control feeding both the headphone socket and variable audio output sockets — not bad for £180.

Importantly, shedding its cosmetics in

this fashion has allowed Sony to retain the analogue circuitry first deployed in the 797, including the unusual combination of J-FET and bipolar op-amps which surely contributed to the latter's appealing sound.

Sound quality

Impressive for a budget machine, this player seems able to retain the intimacy of a simple vocal track while creating an equally natural and compelling sound with the densest of orchestrations, this consistency achieved in the context of a very smooth, self-effacing treble and a full and slightly soft bass.

Arnold's *Viola Concerto* was considered both immediate and tangible in character, the music driven by a sense of purpose without sounding hard or relentless. Yet the brass from Prokofiev's *Romeo and Juliet* could have enjoyed a little extra

brilliance, while solo performers — Sadao Watanabe in particular — tended to drop back into the soundstage.

There were compliments for the dynamics of the Prokofiev piano, despite some textural softness in the woodwind and tympani. The pop discs too sounded tidy and clean rather than edgy and scratchy, which is further proof that low-cost CD players have come of age.

Conclusion

The relaxed, gentle and well balanced sound found everyone nodding appreciatively, blissfully unaware they were faced with a sub-£200 machine. It sounds remarkably civilised without being boring. Described by the panel as a player which oozes detailed and lively music with no obvious vices, this amounts to a recipe for success at a low price.

LAB REPORT

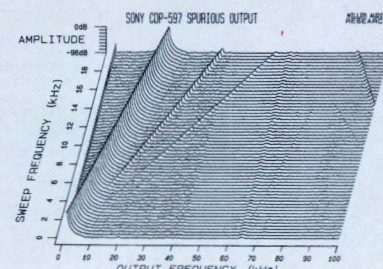
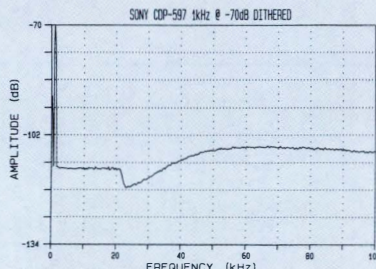
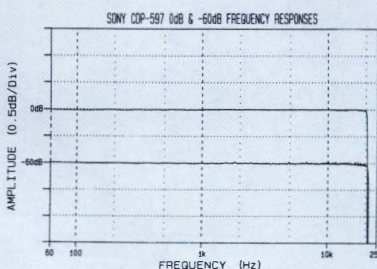
What we have here is an example of state-of-the-art performance, sub-£200 style. There's a slight increase in peak-level THD from the 797's 0.001-0.0037 per cent to the 597's 0.0019-0.019 per cent but the ruler-flat frequency responses and masterful 105dB stop-band rejection all confirm the high quality of Sony's CXD2560 oversampling filter.

The CDP-597 is also blessed with near-perfect low-level linearity and an ideal response to dithered signals. Incidentally, the dithered -70dB trace indicates a 1-2dB dynamic range advantage over the 797. The S/N tests show that a digital mute circuit is being used to bolster the figures — judging by the equally improbable +18dB noise modulation, I'd say a 'real-life' S/N ratio of 103dB is pretty near the mark.

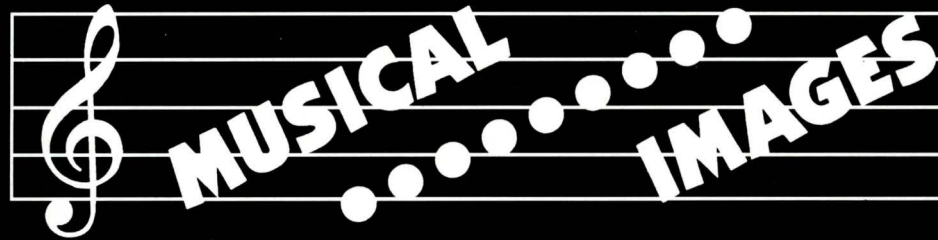
	20Hz	1kHz	20kHz
Channel Balance	0.04dB	0.04dB	0.07dB
Channel Separation	121.6dB	117.1dB	87.4dB
THD vs Level, 0dB	-94.6dB	-93.4dB	-74.5dB
-30dB	-96.9dB	-81.4dB	-70.9dB
-60dB	-60.9dB	-53.2dB	-41.0dB
-80dB	-28.2dB	-30.6dB	-22.4dB
Dithered, -90dB	-18.0dB	-21.5dB	-11.0dB
Dithered, -100dB	-6.90dB	-17.5dB	
Dithered, -110dB	-0.07dB	-0.04dB	
Resolution @ -60dB	-0.01dB	0.00dB	
-80dB	-0.07dB	-0.04dB	
-90dB	-0.42dB	-0.37dB	
-100dB	-0.20dB	-0.30dB	
Peak Output Level, L	2.079V		
R	2.069V		
Relative Output Level			+0.32dB

TEST RESULTS

Output Impedance	923ohm
Radio Frequency Spurious	2mV @ 34MHz
1Hz Noise Modulation	+17.6dB*
CCIR IMD, 0dB	-96.0dB
Suppression of stop-band IMD	104.9dB
De-emphasis Accuracy, 1kHz	-0.09dB
5kHz	-0.09dB
16kHz	-0.09dB
S/N Ratio (A-wtd), w emp, 0LSB	122.1dB
w/o emp, 0LSB	122.1dB
Digital Output	122.1dB*
w/o emp, 1LSB	122.1dB*
None	None
Crystal Clock Accuracy	-57.5ppm
Track Access Time (99)	3.5secs
Typical Retail Price	£180



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Yamaha CDX-660



Like most mainstream hi-fi brands, Yamaha makes use of common technological 'building blocks' to spread the cost of manufacturing investment across its five strong range. The CDX-860 (issue 112) and this cheaper £250 CDX-660 employ the same composite 'ART' chassis, disc drive mechanism and 'S-Bit Plus' digital circuitry.

The player conforms to Yamaha's traditional styling, and the generous feature count includes full direct track access, 25-track programming, tape edit, repeat and random play facilities. Exactly the same widgets as included on the 860, but without the revolving platform to hide them.

One noteworthy innovation is that Yamaha has developed its own Bit Stream ICs which combine 384 times oversampling with second order noise-shaping. Yamaha feeds its 'noise-shaped' bitstream

to a pair of synchronised NAND gates (the so-called I-PDM stage) which function rather like the TDA1547 bit-converter of the Philips DAC7 system.

Sound quality

Confronted by a neutral, natural midband plus a slightly pinched, hard top-end, our panellists, unprompted, identified this as a Yamaha player. They were intrigued by its ability to sustain the subtler modulations of both instruments and vocalists alike, revealing the fixed mike position but swaying balance and imagery of Watanabe's sax.

The decay of vocal phrases from Mary Carpenter's disc and the delightfully woody solo viola timbre in Arnold's *Concerto* were brought out with equal dexterity, and more important perhaps it did not hinder the melancholy atmosphere of this

Concerto, the steady drawl of strings cultivating a genuinely depressing ambience.

Taking a metaphorical step back also revealed a slow and lumbering character, one whose ample but ill-defined bass tended to bunch-up on our more complex recordings. The top-end could sound rather spitty too, but these were described as "global qualities" within which its quirky but attractive subtleties remained.

Conclusion

The CDX-660 is a well-built and flexible machine that contains more than its fair share of hi-tech innovation, justifying its £50 saving over the 860 through a cheaper analogue stage and player cosmetics. This revision may slow and soften its music but rarely is the player any less than endearing, trading vigour for stealth without losing the status of Recommendation.

Contact

YAMAHA ELECTRONICS
UK LTD,
YAMAHA HOUSE,
200 RICKMANSWORTH RD,
WATFORD,
HERTS WD1 7JS

0923 233 166

Verdict

- Offers the best bits of the CDX-860 with a saving of £50.
- The balance can sound slightly hard or unforgiving.
- **£250.00 RRP**

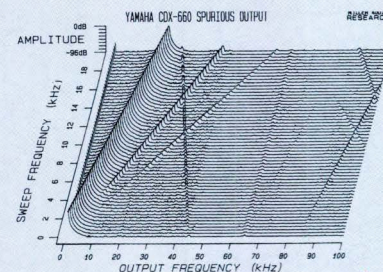
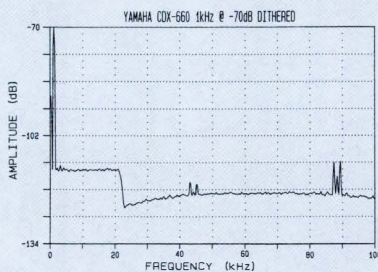
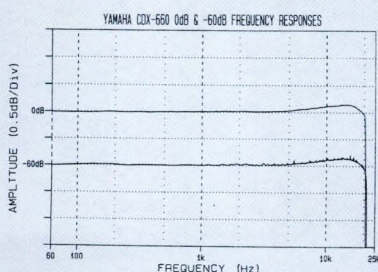
LAB REPORT

All Yamaha's players are currently equipped with its YM3433 eight times oversampling filter, for example, so all give similar stop-band streaks on the 3D plot. However, the excellent control of ultrasonic noise, demonstrated in the -70dB plot, is specific to the 660 and 860, as only these players use Yamaha's YAC507 oversampler and 2nd-order noise-shaper.

Having pored over the service manual and parts list I discovered that the 660 does have lower specification op-amps than the 860 in its analogue filter stage, which is presumably the source of its higher 0.0017-0.024 per cent THD. Distortion certainly picks-up at the frequency extremes (see 3D plot) but these harmonics give way to an innocuous carpet of noise below -10dB or so. Credit should also be given for its excellent low-level linearity.

TEST RESULTS

Channel Balance	20Hz	1kHz	20kHz	Output Impedance	670ohm
Channel Separation	0.12dB	0.12dB	0.17dB	Radio Frequency Spurious	4mV @ 1.4MHz
THD vs Level, 0dB	141.4dB	101.4dB	74.7dB	1Hz Noise Modulation	+8.4dB
-30dB	-95.5dB	-93.2dB	-72.4dB	CCIR IMD, 0dB	-95.8dB
-60dB	-95.6dB	-82.9dB	-80.3dB	Suppression of stop-band IMD	72.4dB
-80dB	-58.9dB	-53.8dB	-53.6dB	De-emphasis Accuracy, 1kHz	-0.01dB
Dithered, -90dB	-28.3dB	-32.1dB	-33.7dB	5kHz	-0.12dB
Dithered, -100dB	-17.2dB	-21.6dB	-24.1dB	16kHz	-0.10dB
Dithered, -110dB		-20.6dB		S/N Ratio (A-wtd), w emp, 0LSB	118.3dB
Resolution @ -60dB		-0.09dB	-0.02dB	w/o emp, 0LSB	116.9dB
-80dB		0.00dB	-0.03dB	Digital Output	109.6dB
-90dB		-0.09dB	-0.33dB	Coaxial	+15.0ppm
-100dB		-0.17dB	+0.97dB	Crystal Clock Accuracy	6.5secs
Peak Output Level, L		1.971V		Track Access Time (99)	£250
R		2.001V		Typical Retail Price	
Relative Output Level		-0.06dB			



Aura CD-50



If you're particularly seeking a CD player not much thicker than a wafer biscuit, then look no further than Aura's new CD-50. This £400 player has Philips' CDM9 disc drive mechanism to thank for its graceful profile, and marks Aura's debut into the fast-moving world of digital audio, a baptism of fire it hopes to survive through gracious aesthetics rather than technical innovation.

There's no change to the basic Philips 600 Series board layout, the SAA7310 decoder or SAA7321 Bit Stream DAC but the original LM318 op-amps have been exchanged for flavour-of-the-month Burr-Brown OPA2604s.

Facilities on the player itself are limited to play, stop and forward track skip but are expanded to cover direct track access, repeat and memory play via the (Philips) remote handset. Somewhat inconveniently

the player's internal logic does not respond to commands for index cueing or direct track programming (as distinct from access) from this IR handset.

Sound quality

This is a spirited performer, by all accounts, if one that all too readily loses its self-restraint and tends to trip up with the effort of handling densely-recorded material.

Our piano sequences sounded somewhat hard and up-front, lacking the rich and resonant quality we had come to expect, and not really reflecting the contrast between staccato flurries of ivory. "Seems quite content to lose bits of information", suggested the panel, "bumbling along and shedding performers, particularly those within an orchestra, along the way".

Nor is there any real definition or confidence in the bass, an "ill-defined wobble" of drums on Prokofiev's *Romeo and Juliet* being likened to the "chuffing of a steam engine". Nevertheless the CD-50 does have spirit, and a somewhat scatty enthusiasm that's best suited to simple acoustical recordings rather than full-blown orchestral pieces.

Conclusion

Big on presentation but short on subtlety, this well-disguised CD player looks elegant enough, but its performance is as lightweight as its construction. The option of a chromed fascia and the novelty of right-hand drive ensure the CD-50 has its own stylistic niche, but the sound is simply too ordinary to qualify for Recommendation in such a highly competitive sector of the market.

Contact

B&W LOUDSPEAKERS LTD.
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0903 750 750

Verdict

- +** Super slim aesthetics and attractive chrome option.
 - Easy listening but hardly state of the art for the money.
- ▶ **£400.00 RRP**

LAB REPORT

Aura has drafted in a new CDM9 transport, devised its own in-house servo board and modifications for the analogue output stage. Nevertheless, the technical fingerprint is little different from any other Philips 600 Series derivation.

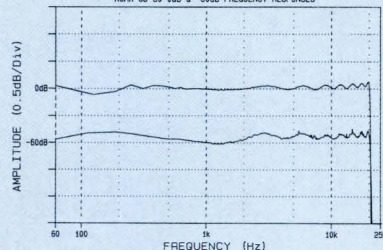
The distortion pattern is fairly typical, ranging from 0.0018-0.04 per cent at peak level to 0.52-2.5 per cent at -60dB. The increase in THD at 20kHz is prompted by an increase in requantisation noise from the DAC's second order noise shapers. The rippled stop-band images (-54dB) and 3rd/5th harmonics visible on the 3D plot are further evidence of Philips' SAA7321 DAC.

The 'adequate' S/N ratio is compromised by CLV tones at 7.35kHz, 14.7kHz and 22.05kHz, yet a 97dB figure is once again pretty typical. The only diversion comes in its undulating frequency response, particularly at -60dB where the ripples are more exaggerated than usual.

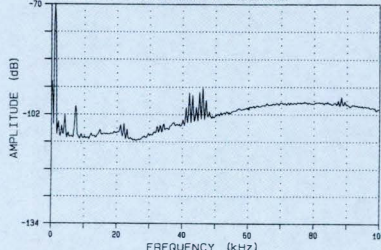
TEST RESULTS

Channel Balance	20Hz	1kHz	20kHz	Output Impedance	202ohm
Channel Separation	0.04dB	0.04dB	0.04dB	Radio Frequency Spuria	6mV @ 11.3MHz
THD vs Level, 0dB	96.4dB	98.8dB	96.6dB	1Hz Noise Modulation	+2.2dB
-30dB	-95.1dB	-95.1dB	-68.1dB	CCIRIMD, 0dB	-96.5dB
-60dB	-74.4dB	-67.1dB	-64.4dB	Suppression of stop-band IMD	54.4dB
-80dB	-45.6dB	-41.2dB	-31.9dB	De-emphasis Accuracy, 1kHz	-0.18dB
-90dB	-16.6dB	-21.3dB	-15.7dB	16kHz	-0.11dB
-100dB	-8.50dB	-14.5dB	-6.50dB	5kHz	+0.09dB
Dithered, -90dB				16kHz	98.2dB
Dithered, -100dB				S/N Ratio (A-wtd), w emp, 0LSB	96.4dB*
Dithered, -110dB				w/o emp, 0LSB	96.8dB*
Resolution @ -60dB				Digital Output	Coaxial
-80dB				Crystal Clock Accuracy	+35.0ppm
-90dB				Track Access Time (99)	4.5secs
-100dB				Typical Retail Price	£400 (£450 chrome)
Peak Output Level, L					
R					
Relative Output Level					

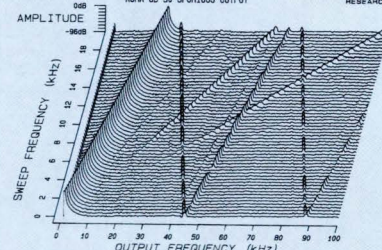
AURA CD-50 0dB @ -60dB FREQUENCY RESPONSES



AURA CD-50 1kHz @ -70dB DITHERED



AURA CD-50 SPURIOUS OUTPUT



JVC XL-Z1050



Every once in a while a player comes along that uses established circuitry but new chips to hurdle the boundaries of current technology. So it is with JVC's £500 XL-Z1050, a flagship player whose appearance alone is light years ahead of its Far Eastern rivals.

Press the eject key and a wafer-thin drawer glides silently from the centre of the titanium-grey fascia, revealing a hi-tech 3-beam mechanism flanked by two thread-like displays, one with track and time data, the other a linear 20-track music calendar.

The remote handset has features like direct track and index search plus various repeat, random and program play modes, and a motorised volume control is exposed on the player itself, with numerous other facilities, once the fascia is retracted.

Inside, JVC has retained the K2 remiming circuit, an optically isolated inter-

face that regenerates the 'edges' of digital data passing between its signal processor, eight times oversampling filter and PDM DAC. The JVC JCE4501 DAC is a complex bitstreamer that squeezes a greater variation of pulse 'widths' into each 64 times oversample period by defining the 'edge' of each new pulse as the difference between two overlapping PWM datastreams. Like I said, this is hi-tech stuff.

Sound quality

Our panel described this as a 'big-sounding player', one that lent Mary-Chapin Carpenter a large, throbbing voice somehow more akin to Alison Moyet. Furthermore, a combination of extreme treble detail with sharp, percussive peaks occasionally 'tipped it over the edge', momentarily breaking up the music.

Tonally the music remains neutral until

it's faced with processed pop like Jennifer Warnes' *Hunter* whose percussion brought a distinctive 'zing' to the extreme treble. Otherwise its even-handedness suited the violas in the *Arnold Concerto* well, sounding vivid and alive if not totally convincing.

Ultimately the listeners insisted on describing the Z1050 as a 'quite product', one that is quite dynamic, quite tidy and quite detailed — but one which has the habit of reducing highly emotive music nearer to the level of background tunes.

Conclusion

Unfortunately hi-tech engineering can just as readily crush as nurture the fragile blossom of music, and this appears to be the case with this JVC. Which is a pity as the XL-Z1050 is, in every other sense, an impressive example of modern CD player design pitched at a highly realistic price.

Contact

JVC (UK) LTD.
JVC BUSINESS PARK,
PRIESTLEY WAY,
LONDON NW2 7BA

081 450 3282

Verdict

- + Excellent build quality, plenty of advanced technology.
- Sounds a bit pinched or bright with some CDs.
- ▶ £500.00 RRP

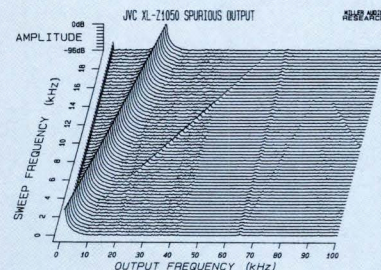
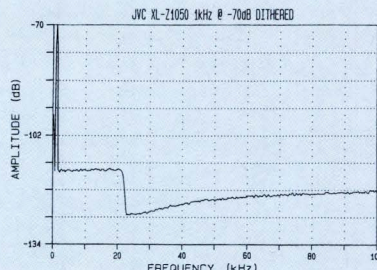
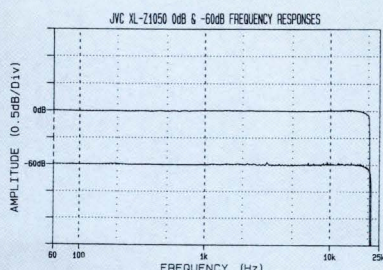
LAB REPORT

In many respects this player leads modern bitstream technology. THD at peak level, for example, stays within 0.0003-0.0015 per cent at the frequency extremes, though the 3D plot shows an increase in 3rd harmonic 8-14kHz. The action of the analogue filter as it bites into this harmonic at higher frequencies can also be seen. More importantly, however, distortion is kept to just 0.0014-0.0096 per cent at -30dB — crucial in terms of the music recorded on CD.

The 98dB suppression of stop-band noise is also reflected in the clean 3D plot, while the wide dynamic range and highly effective variable order noise shaping (VANS) is proven by the -70dB plot with its freedom from sampling and harmonic distortions. But the one significant drawback is the uncommonly large +13dB noise modulation figure, which effectively puts paid to its state-of-the-art 114dB S/N ratio, and possibly affects the sound quality adversely too.

TEST RESULTS

Channel Balance	0.04dB	0.04dB	0.09dB	Output Impedance	105ohm
Channel Separation	124.3dB	123.2dB	92.6dB	Radio Frequency Spurious	3mV broadband
THD vs Level, 0dB	-110.0dB	-109.6dB	-96.6dB	1Hz Noise Modulation	+13.0dB
-30dB	-96.9dB	-83.5dB	-80.4dB	CCIR IMD, 0dB	-100.6dB
-60dB	-61.2dB	-55.8dB	-54.2dB	Suppression of stop-band IMD	97.5dB
-80dB	-28.4dB	-31.3dB	-34.1dB	De-emphasis Accuracy, 1kHz	+0.02dB
Dithered, -90dB	-18.0dB	-22.4dB	-25.4dB	5kHz	+0.12dB
Dithered, -100dB		-21.4dB		16kHz	-0.01dB
Resolution @ -60dB		-14.0dB		S/N Ratio (A-wtd), w emp, 0LSB	116.6dB
-80dB		0.00dB	-0.01dB	w/o emp, 0LSB	114.0dB
-90dB		-0.12dB	-0.06dB	w/o emp, 1LSB	113.8dB
-100dB		-0.47dB	-0.32dB	Digital Output	Coaxial/Optical
Peak Output Level, L	+0.04dB	+1.20dB		Crystal Clock Accuracy	-57.5ppm
R	2.229V	2.218V		Track Access Time (99)	4.5secs
Relative Output Level		+0.92dB		Typical Retail Price	£500



Kenwood DP-7050



Judging from appearance alone, Kenwood might justifiably be accused of tinkering with the elegantly chamfered fascia of its DP-7040 in order to reintroduce it as the DP-7050, complete with a £50 premium. This £330 DP-7050 is certainly every bit as luxurious as its predecessor, the sealed CDM-19 transport mechanism forming the heart of a player that's both generously equipped and gloriously over-engineered.

For example, Kenwood's Disc File will store information on up to 80 CDs in either track or time modes, a facility that's joined by index search, intro scan, various tape edit and repeat modes, peak search and volume control on its accompanying remote handset.

However, in this fourth incarnation of the 7000 Series, Kenwood has chosen to incorporate a foreign convertor technol-

ogy, in Philips' top Bit Stream system, the fabled DAC7.

Sound quality

The despondent glances that passed between our listeners made it clear that all was not well. "A bit of a mixed bag", they began "subjectively loud, slightly hard and occasionally invasive." They then suggested that the balance only became uncomfortable when struggling with loud and busy pieces of music; Mary Carpenter's voice, for example, took on an increasingly nasal and forward tone as the arrangement grew in pitch and urgency.

On the whole, individual performers appeared sharply etched but cast as silhouettes rather than the rounded musicians we had come to expect. Sadao's ripe-sounding sax prompted strong criticism of a thin and weedy resonance, which

was likened to the rasp of a kazoo.

On the positive side the listeners applauded both its sense of pace and momentum, for this is neither a sluggish nor muggy-sounding player. Its reluctance to create a feeling of space and atmosphere seems due to a dry tonal quality that prevents the full richness, depth of tone and sheer dynamics of strings, brass and percussion from being realised.

Conclusion

On hearing of the DP-7050's origins, our listeners remarked upon the disparity between its dry, thin sound and the gracious if sober quality of its predecessors which were of course based upon an alternative bitstream technology. They concluded that there was probably a potentially better player inside suffering the straightjacket of its present implementation.

Contact

TRIO-KENWOOD UK LTD,
KENWOOD HOUSE,
DWIGHT ROAD,
WATFORD,
HERTS WD1 8EB

0923 816 444

Verdict

- +** Superbly engineered with a dry and upbeat sound.
- Its composure is strained by busy or complex recordings.

▶ **£330.00 RRP**

LAB REPORT

Kenwood's implementation of the Philips TDA1547 (DAC7) with an NPC SM5840CP eight times oversampling filter and SAA7350 noise-shaper is unique. The Philips CD950 uses the same complement of chips, yet by running the SAA7350 at 11.3MHz it incurs a huge 'bump' of ultrasonic re-quantisation noise.

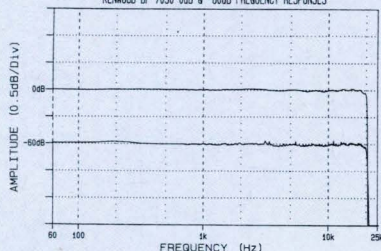
Instead Kenwood has opted for a 16.9MHz master clock (192 times oversampling), reducing digital noise by 30dB against conventional implementations and improving 20kHz distortion from 0.022 to 0.0035 per cent.

Other systems also rely on the faster 16.9MHz clock but either use alternative oversampling filters, or deploy two DAC7 chips in double-differential mode. Kenwood's solution leaves us with a combination of ultra-low distortion, fine 20kHz linearity, an excellent 106dB S/N ratio and quite the most accurate de-emphasis routine on record.

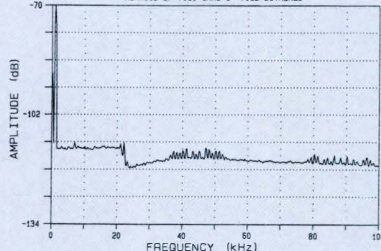
TEST RESULTS

Channel Balance	0.04dB	0.04dB	0.07dB	Output Impedance	394ohm
Channel Separation	121.7dB	109.4dB	82.4dB	Radio Frequency Spurious	9mV @ 34MHz
THD vs Level, 0dB	-100.1dB	-101.0dB	-89.2dB	1Hz Noise Modulation	+6.6dB
-30dB	-88.8dB	-80.8dB	-77.2dB	CCIR IMD, 0dB	-98.9dB
-60dB	-51.6dB	-47.1dB	-50.3dB	Suppression of stop-band IMD	60.9dB
-80dB	-27.5dB	-27.2dB	-30.4dB	De-emphasis Accuracy, 1kHz	0.00dB
Dithered, -90dB	-16.6dB	-17.8dB	-21.4dB	5kHz	0.00dB
Dithered, -100dB	-16.0dB	-16.0dB	-10.6dB	S/N Ratio (A-wtd), w emp, 0LSB	108.0dB
Dithered, -110dB	-10.6dB	-10.6dB	+0.01dB	w/o emp, 0LSB	108.3dB
Resolution @ -60dB	-0.02dB	-0.03dB		w/o emp, 1LSB	106.1dB
-80dB	+0.06dB	+0.01dB		Digital Output	Optical
-90dB	-1.35dB	+0.06dB		Crystal Clock Accuracy	+118.8ppm
-100dB	-1.05dB	+0.65dB		Track Access Time (99)	4secs
Peak Output Level, L	2.107V			Typical Retail Price	£330
R	2.118V				
Relative Output Level	+0.48dB				

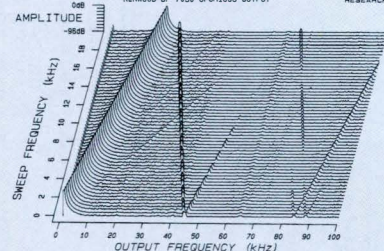
KENWOOD DP-7050 0dB 6 - 60dB FREQUENCY RESPONSES



KENWOOD DP-7050 1kHz @ -70dB DITHERED



KENWOOD DP-7050 SPURIOUS OUTPUT



Marantz CD-52IISE



must admit to becoming rather dizzy with Marantz' merry-go-round of modifications. To my mind the original CD-52 and CD-52SE never really had a chance to establish themselves before being torpedoed by the CD-52II, a player that boasted various SE-style tweaks at the price of a standard 52.

Naturally, a formal SE version of this already semi-SE CD-52II was all but inevitable, providing us with yet another version of what has become a very familiar-looking machine.

This version sees the same JRC op-amps, damped 11.3MHz crystal, the same BGF supply electrolytic, Silmic decoupling and back-to-back AC coupling caps first devised for the 52SE and, in part, the 52II. In this fourth version, however, Marantz has also drafted in a new mu-metal mains transformer together with a pair of red

Cerafine electrolytics for the analogue power supply, simple changes that will influence the basic character of its Bit Stream chipset.

Sound quality

Auditioned immediately after the CD-52II, our panel recognised its common heritage and commented that "the (acoustic) window was thrown wide open, only to let in bags of riotous information".

This larger-than-life perspective was revealed in the imposing and eager resonance of Mary-Chapin Carpenter's voice, which built up to a glaring sibilance at higher levels. By contrast the sweeter sound of Arnold's *Viola Concerto* was described as 'sugar-coated'.

The sheer quantity of information, the exuberance and naive enthusiasm that bubbles from the 52IISE is impressive but

also disorientating, a melle of instruments that tumble from the speakers with scant regard to the form or structure of the music. On the other hand its immediacy, and fresh and frisky balance can be quite attractive; it's simply a matter of readjusting your sensibilities.

Conclusion

With a publicity bandwagon still running at high speed, these latest Marantz players have garnered something of an heroic, if not entirely realistic reputation. A fair and blind listening test is no respecter of reputation of course, so with its collective feet placed securely on terra firma, our panel identified with the Marantz 'family sound', but concluded that the 52IISE was "a slightly contrived and jazzed-up version of the CD-52ii" — all the more exciting, but also all the more risky.

Contact

MARANTZ HI-FI (UK) LTD.
KINGSBRIDGE HOUSE,
PADBURY OAKS,
581 BATH ROAD, LONGFORD,
MIDDLESEX UB7 0EH

0753 680 868

Verdict

- +** Bubbly and exciting sound, reminiscent of the CD-52.
- Not a CD player for those with a faint heart.
- ▶** £300.00 RRP

LAB REPORT

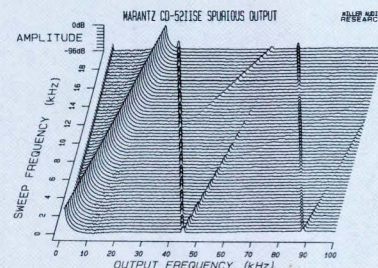
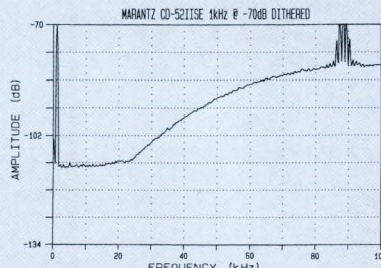
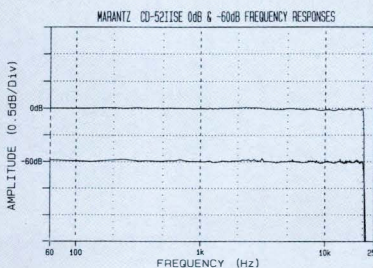
If any further proof was required of the dominant role played by the SAA7310 decoder, NPC SM5840 oversampling filter and SAA7350 Bit Stream DAC then this is it. We are again faced with a lightly rippled but essentially flat frequency response that's indistinguishable from any other of the CD-52 series.

Similarly, Marantz choice of decoder ties it to an 11.3MHz master clock, which in turn results in the huge mound of ultrasonic re-quantisation noise from the SAA7350's noise-shapers, noise that could introduce some unpredictability into its subjective performance with different amplifiers.

Otherwise the slightly higher 0.0012-0.03 per cent THD, the increased +3.7dB linearity deviation and reduced 100dB S/N ratio suggest that this 52IISE errs towards the lower end of Philips' production tolerance. Another sample might just as easily have matched the 52II — it's simply the luck of the draw.

TEST RESULTS

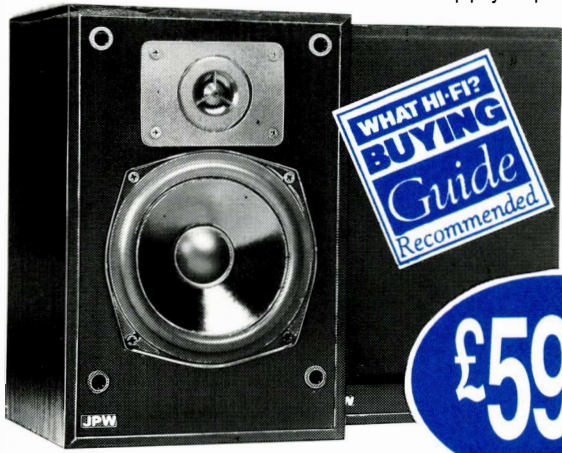
Channel Balance	0.12dB	0.11dB	0.12dB	Output Impedance	204ohm
Channel Separation	110.6dB	111.4dB	88.9dB	Radio Frequency Spuria	
THD vs Level, 0dB	-98.2dB	-96.1dB	-70.6dB	1Hz Noise Modulation	+4.0dB
-30dB	-82.5dB	-77.1dB	-47.5dB	CCIRIMD, 0dB	-96.3dB
-60dB	-48.0dB	-44.3dB	-19.1dB	Suppression of stop-band IMD	60.5dB
-80dB	-26.2dB	-24.6dB	+1.40dB	De-emphasis Accuracy, 1kHz	+0.01dB
-90dB	-16.4dB	-15.8dB	+8.50dB	5kHz	0.00dB
Dithered, -90dB		-14.4dB		16kHz	-0.01dB
Dithered, -100dB		-6.50dB		S/N Ratio (A-wtd), w emp, 0LSB	101.8dB
Resolution @ -60dB		+0.04dB	+0.02dB	w/o emp, 0LSB	102.7dB
-80dB		+0.70dB	+0.48dB	w/o emp, 1LSB	100.4dB
-90dB		+1.65dB	+1.18dB	Digital Output	Coaxial
-100dB		+2.10dB	+3.65dB	Crystal Clock Accuracy	+26.3ppm
Peak Output Level, L		2.184V		Track Access Time (99)	3.2secs
R		2.213V		Typical Retail Price	£300
Relative Output Level			+0.82dB		





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Pioneer PD-S901



Appearance alone suggests the £470 PD-S901 is no ordinary CD player. For a start it features Pioneer's novel 'stable platter mechanism', a mini-turntable that supports the disc from below while the laser reads from above, requiring the CD be loaded upside-down (silver side up). We first encountered this unusual disc drive in Pioneer's PD-7700 and PD-8700 (issue 10).

Inside is Pioneer's 'legato link conversion' (LLC), a by-product of an unusual eight times oversampling filter. Conventional digital filters attempt to scrub-out the mirror-images of music data that occur above 22.05kHz (half the 44.1kHz sampling frequency), but the LLC filter attempts to dovetail these digital reflections into the top octave of music.

The end result is a frequency response that seems to extend beyond 20kHz,

even if these extra signals are digital rubbish rather than the musical harmonics that Pioneer suggests. However, the S901 is solidly built, beautifully finished and a joy to operate with all the usual features under handset control.

Sound quality

The confidence of this player was instantly revealed by its combination of subtlety, authority and back-to-basics power. Tonally it's on the dark side of neutral, but remains free of grittiness, fizziness or any other fatiguing nasties of lesser players. Its smoothness reinforced the body of Watanabe's alto sax and prevented it sounding like a pinched, mute trumpet.

Very little detail escapes. The crack of wood blocks in Prokofiev's *Romeo and Juliet* announced a confident performance which sustained the delicate sweeping

quality of strings alongside the weighty, pulsive rhythm of tympani and bass drums. Likewise the subtle inflections, intonation and huskiness of Mary-Chapin Carpenter was revealed seductively, while conveying all the weight and resonance of the piano.

Classical tracks undoubtedly benefitted from this broad sense of staging and depth, the player bringing the various groups of strings, woodwind and brass from Arnold's *Concerto* into sharp relief.

Conclusion

The success of Pioneer's LLC is not always predictable, but when on form its rock solid imagery and walk-in soundstaging makes for a dazzling experience. So it is here, the PD-S901 conveying its music in a self-assured but rarely authoritarian manner — a sound that invites rather than cajoles. Strongly Recommended.

Contact

PIONEER HIGH FIDELITY (GB) LTD.
FIELD WAY,
GREENFORD,
MIDDLESEX UB6 8UZ

081 575 5757

Verdict

- Very powerful but controlled and engaging sound.
 - Could sound too civilised or laid back in some systems.
- ▶ **£470.00 RRP**

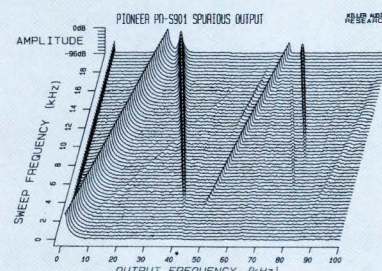
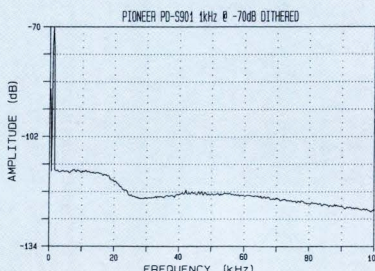
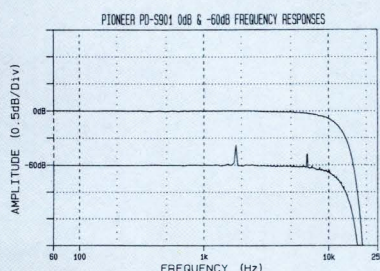
LAB REPORT

A thorough overview of LLC is available in issue 113, where the system is explored along with Wadia's DigiMaster software, a more expensive variation on an identical theme. Either way the effects of Pioneer's LLC filter (the PD0116A) are most obvious from the premature frequency response roll-off and the thumping great stop-band images of the 3D plot.

This treble loss is misleading, however, for although output falls to -3.7dB at 20kHz, the (dark) left-hand sampling image (on the 3D plot) helps to extend this gentle roll-off beyond the audio band, rolling off gently to -12.3dB at 25kHz and -47.7dB at 35kHz. By contrast a modern FIR digital filter would achieve at least 60dB attenuation beyond 22.05kHz. Otherwise the PD-S901 is a model Bit Streamer, featuring very low distortion (typically 0.0009-0.003 per cent), glitch-free low-level resolution and a wide 108dB S/N ratio. RF noise is also low.

TEST RESULTS

	20Hz	1kHz	20kHz	490ohm
Channel Balance	0.01dB	0.01dB	0.02dB	3mV broadband
Channel Separation	147.9dB	133.5dB	123.2dB	-97.9dB
THD vs Level, 0dB	-100.7dB	-96.4dB	-89.3dB	6.6dB
-30dB	-96.6dB	-82.7dB	-78.9dB	-0.01dB
-60dB	-62.6dB	-56.3dB	-53.2dB	-0.01dB
-90dB	-28.4dB	-30.6dB	-32.0dB	117.5dB
Dithered, -90dB	-18.3dB	-21.7dB	-22.1dB	114.5dB
Dithered, -100dB		-19.0dB		108.4dB
Dithered, -110dB		-8.0dB		Coax/Opt
Resolution @ -60dB		+0.01dB	-0.01dB	+6.3ppm
-80dB		-0.02dB	-0.07dB	Track Access Time (99)
-90dB		-0.35dB	-0.35dB	4.5secs
-100dB		-0.30dB	+0.10dB	£470
Peak Output Level, L		2.377V		
R		2.409V		
Relative Output Level			+1.56dB	



Rotel RCD-965BX LE



Contact

GAMEPATH LTD,
25 HEATHFIELD,
STACEY BUSHES,
MILTON KEYNES,
MK12 6HR

0908 317 707

Rather than tool-up for a new generation of CD players it is often more prudent for a manufacturer to revitalise an existing and very popular chassis. To this end Rotel is introducing an LE version of its Best Buy RCD-965BX, as something of a stop-gap measure while awaiting its next generation of mainstream CD players.

This looks and feels just like the original article save for the Limited Edition screenprint on the satin black fascia. There's no change on the features front, with a sensible range of program, repeat, random and index skip controls which are supplemented by a direct track access keypad on the matching remote handset.

Under the bonnet, however, this LE version is distinguished by just four new slit-foil electrolytics. This revision will set you back £80, a bitter pill that Rotel hopes

to sweeten with a length of Monster Interlink 400.

Sound quality

Rather than the unanimous applause that had greeted the 965BX in issue 100, this LE variation received a rather mixed reaction from our panel. The player was praised for its ability to communicate the emotive strength of difficult and distant recordings like the Arnold *Viola Concerto*, yet was criticised for the grey, dry and dirty sound delivered from our selection of pop discs.

There's an immediacy which had the effect of 'waking-up the orchestra', infusing strings and woodwind with an excitement, charge and passion that had been missing earlier in the day. Similarly, Prokofiev's *Romeo and Juliet* was realistically tense and dramatic, the music flow-

ing as an integrated whole.

But the jazz and pop discs lacked the poise, the elegance and atmosphere that was so readily developed by the basic 965BX, as individual performers — sax and percussion in particular — were spotlighted with an unwelcome ferocity.

Conclusion

Rotel has infused its LE variation on the 965BX theme with an impassioned and biting character, one which can appear as zest and colour in one instance, but can also sound rough and fatiguing in another, so anyone anticipating a refined version of what is already a highly sophisticated player might find themselves taken aback by a brighter and rather less predictable sound. Meanwhile we are left to ponder why Rotel has chosen to fix what was never broken . . .

Verdict

- A bright, forward and potentially gripping sound.
 - Alas the subtlety and enchantment of the '965 is lost.
- ▶ **£380.00 RRP**

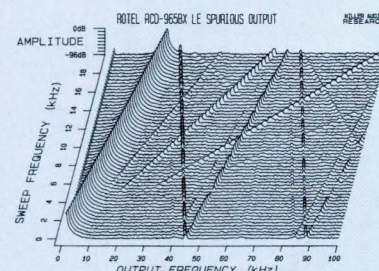
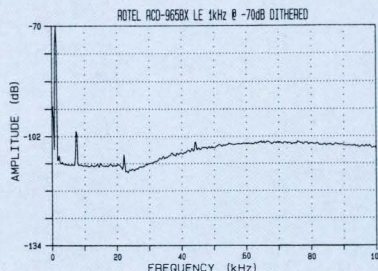
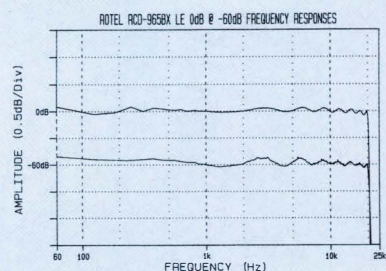
LAB REPORT

Broadly speaking the LE's technical fingerprint is indistinguishable from that of the original 965BX reviewed in issue 100. The third and fifth harmonics plus rippled stop-band images (V-patterns) visible on the 3D plot all derive from the Philips SAA7323 PDM DAC and its integral four times oversampling filter. The frequency response is similarly rippled, although the -60dB trace is rather less affected by hum products than our earlier 965BX.

The 0.0023-0.032 per cent peak-level distortion is wholly typical, as is the leaky CLV reference tone which comes through the -70dB plot and knocks some 4-5dB off the potential S/N ratio. Unusually, however, this unwanted spike is also accompanied by a series of 5.3Hz jitter sidebands, which is a worrying development that has appeared since issue 100. Nor is this LE quite as linear as the original 965BX, suffering an error of some -4.6dB at -100dB.

TEST RESULTS

Channel Balance	0.09dB	0.09dB	0.01dB	Output Impedance	203ohm
Channel Separation	93.5dB	94.7dB	96.2dB	Radio Frequency Spurious	3mV @ 11.3MHz
THD vs Level, 0dB	-92.2dB	-92.9dB	-69.9dB	1Hz Noise Modulation	+1.0dB
-30dB	-78.5dB	-72.5dB	-66.7dB	CCIRIMD, 0dB	-96.2dB
-60dB	-50.0dB	-45.2dB	-38.5dB	Suppression of stop-band IMD	54.3dB
-80dB	-28.1dB	-21.6dB	-16.4dB	De-emphasis Accuracy, 1kHz	-0.04dB
Dithered, -90dB	-17.5dB	-12.5dB	-6.50dB	5kHz	+0.03dB
Dithered, -100dB		-11.5dB		16kHz	-0.01dB
Dithered, -110dB		-3.50dB		S/N Ratio (A-wtd), w emp, 0LSB	98.9dB
Resolution @ -60dB		-0.07dB	-0.11dB	w/o emp, 0LSB	96.1dB
-80dB		-1.10dB	-1.26dB	w/o emp, 1LSB	95.0dB
-90dB		-2.65dB	-3.25dB	Digital Output	Coaxial
-100dB		-4.60dB	-4.50dB	Crystal Clock Accuracy	+3.75ppm
Peak Output Level, L		2.101V		Track Access Time (99)	2.5secs
R		2.124V		Typical Retail Price	£380
Relative Output Level		+0.48dB			(inc Monster Interlink 400)



Technics SL-PS840



This novel £420 SL-PS840 has plenty of features to its credit. The player itself is surrounded by a 'viscoelastic belt' referred to as THCB (Technics Hybrid Construction Base), a fancy acronym for something that helps absorb incoming vibrations. With similar thoughts in mind, the SL I transport mechanism has been centrally positioned and mechanically decoupled for maximum isolation.

Incidentally its swing-arm disc loading mechanism is just about the quietest and slickest in town, speeding in and out of the player in virtual silence while locating peripheral tracks in less than two seconds flat — not bad from a standing start.

Technics' recent fascination with MOSFET technology has also filtered through as the basis of its so-called 'Virtual Battery Operation'. Its literature on the subject is, broadly speaking, guff though

the concept of adopting a MOSFET power-supply buffer and a pre-charged capacitor which acts as a low-noise voltage reference is sound enough.

Sound quality

Judging from the response of our listeners this player has a highly realistic sound, free from contrived hype or glare without losing its "equally natural grip of musical dynamics". Carpenter's piano sounded "realistically clangy", the instrument played with both spirit and feeling despite remaining slightly detached from the main body of the recording.

On the whole the performances are relaxed but also slightly recessed, with a syrupy-sweet treble that's still able to reveal the delicate brush of cymbals without exacerbating the tape noise of an old, analogue recording.

Similarly, the rhythmic percussion contained within Prokofiev's *Romeo and Juliet* remained just as spacious and delicate in tone even when a full-bodied and rasping brass chorus might burst confidently from the speakers. In such circumstances the sweet balance of the player was manifest in its unmistakable refinement, rather than in a prematurely curtailed treble.

Conclusion

In certain respects this unexpected newcomer is perhaps too easy-going, too laid-back or syrupy to portray accurately the most up-beat material. But then the SL-PS840 was never conceived to blow your neighbour's socks off, a party trick best left to the funkier sound of Technics cheaper players. Instead it's one to buy in haste and savour at your leisure.

Contact

PANASONIC UK LTD,
PANASONIC HOUSE,
WILLOUGHBY ROAD,
BRACKNELL,
BERKS
RG12 8PF

0344 862 444

Verdict

- + A mature and very slick version of favourites like the '520A.
- Too easy going, could do with a little extra fibre in its belly.
- ▶ £420.00 RRP

LAB REPORT

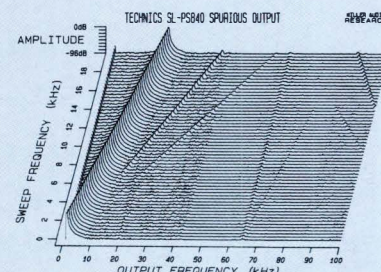
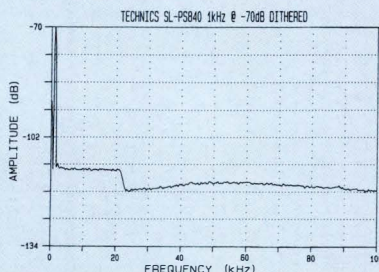
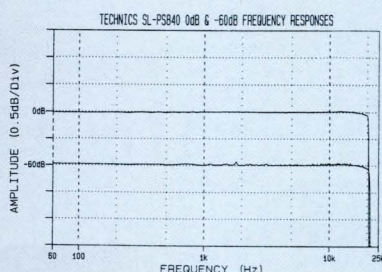
If Technics' SL-PS840 bears a physical resemblance to the earlier SL-PS900 (issue 100), the technical bloodline is also continued with a new top-end MN64761 DAC. Its eight PWM networks, full 64 times oversampling and third order noise shapers produce the purely noise-like spurious output above 20kHz.

As can be seen from the -70dB plot, the re-quantisation noise from 20kHz-100kHz is quite free of any sampling intermodulation.

Stop-band images are also stomped on from a great height (well, 105dB anyway), producing the clean 3D plot and ripple-free frequency responses. Distortion is kept at a low 0.00085-0.004 per cent and the DAC's linearity holds true to within 0.4dB across a full 100dB dynamic range and at all frequencies. Meanwhile noise modulation remains a gratifyingly low +2.6dB, a fine result in view of the wide 'real-life' S/N ratio of 103dB.

TEST RESULTS

Channel Balance	20Hz	1kHz	20kHz	Output Impedance	971ohm
Channel Separation	0.00dB	0.02dB	0.08dB	Radio Frequency Spuria	6mV @ 85MHz
THD vs Level, 0dB	133.3dB	112.8dB	86.1dB	1Hz Noise Modulation	+2.6dB
-30dB	-95.4dB	-101.4dB	-87.5dB	CCIR IMD, 0dB	-95.5dB
-60dB	-97.0dB	-81.7dB	-77.3dB	Suppression of stop-band IMD	104.8dB
-80dB	-61.2dB	-52.9dB	-49.8dB	De-emphasis Accuracy, 1kHz	+0.04dB
-90dB	-28.5dB	-31.1dB	-30.2dB	5kHz	+0.10dB
Dithered, -90dB	-18.0dB	-20.8dB	-21.7dB	16kHz	+0.08dB
Dithered, -100dB		-16.4dB		S/N Ratio (A-wtd), w emp, 0LSB	119.2dB
Dithered, -110dB		-7.05dB		w/o emp, 0LSB	117.1dB
Resolution @ -60dB		-0.01dB	0.00dB	w/o emp, 1LSB	103.3dB
-80dB		-0.06dB	-0.03dB	Digital Output	Optical
-90dB		-0.42dB	-0.23dB	Crystal Clock Accuracy	+8.8ppm
-100dB		-0.10dB	-0.20dB	Track Access Time (99)	1.5secs (!)
Peak Output Level, L		2.460V		Typical Retail Price	£420
R		2.452V			
Relative Output Level			+1.78dB		



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AVI S2000MC



AV International is just one of a number of UK companies doing rather well over there while remaining virtually unknown over here. The £999 S2000MC CD player uses the same CDM9/44 transport and nextel-covered 922/02 loader as Sugden's SDT-1 but features a very different brand of genuine 20-bit technology. The mid-sized enclosure is both stylish and exceptionally rugged although the range of facilities, limited to track skip, search and pause, is basic in the extreme.

Furthermore, although AVI has adopted its own microprocessor, display and IR receiver circuits, the unique 'logic' is rather stubborn, refusing to entertain successive keystrokes until the previous command has been executed. The resultant delay encountered when skipping from track to track is frustrating by modern

standards, a quirk in what is otherwise an extremely elegant design.

Sound quality

"Understated, but in the nicest possible way" our listeners remarked, "a player that remains confident without shouting its prowess from the roof tops". Tonally the sound is exceptionally neutral, the weighty but very 'linear' bass allied to an extended but equally smooth and tidy treble. Nevertheless, the S2000MC does sound strangely quiet, and despite being precisely level-matched for our listening tests, seemed less able to handle the dynamic contrasts described by the Linn and Meridian players, for example.

The bustling quality of Prokofiev's *Romeo and Juliet* caused various groups of instruments to become slightly defocused as they picked-up in tempo. Once again

our panel described its presentation as very civilised, disarmingly polite and generally untroubled, but still lacking the drive and energy of more up-beat competition. Rhythmically "everything swings very nicely along", but there is not the eagerness, the fever and passion generated by the most entertaining of players.

Conclusion

Our panel described the S2000MC as: "an example of a well-executed but sadly over-attended player, and one that's perhaps a little too casual or detached for its own good". On the other hand its cool, calm and very level-headed approach to the rigours of music-making is enchanting in its own way. There's no reason why the S2000MC shouldn't be a good long-term bet — an expensive bet, granted, but well worth considering nonetheless.

Contact

AV INTERNATIONAL,
UNIT F3C3, BATH ROAD
TRADING ESTATE,
STROUD, GLOUCESTERSHIRE
GL5 3QF

0903 765 682

Verdict

- +** Novel design work from a past master of the digital art.
- Can sound too civilised to get the blood pumping.
- ▶** **£999.00 RRP**

LAB REPORT

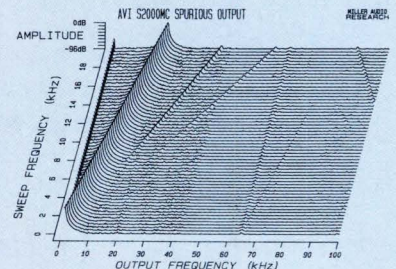
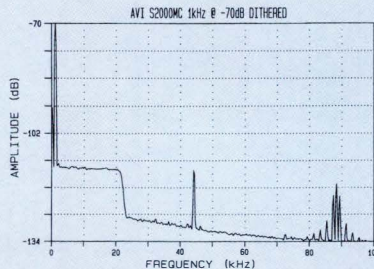
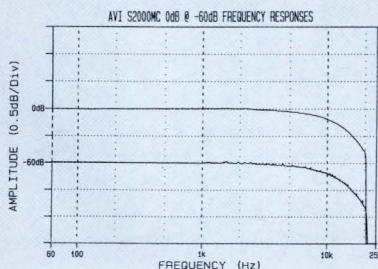
AVI may well have chosen to base its player on CD engine, servo and decoder boards from Philips Industrial Supplies, but the choice of DF1700 eight times oversampling filter and PCM63P DACs (all from Burr Brown) dominate its measured performance. A similar combination is found in the DSM M DAC from Audio Synthesis (issue 113). Nevertheless Burr Brown's claim for 110dB stop-band rejection, repeated by AVI, is not entirely realistic.

The -0.8dB treble roll-off has been engineered by AVI in its Signetics based analogue filter, helping to reduce 20kHz distortion to a low 0.0052 per cent. Distortion is similarly impressive at lower levels, betraying very little of the 0dB to -30dB 'multi-bit lurch' suffered by older 16-bit designs. Tight linearity and wide 113dB S/N are equally superb even though the +14dB noise modulation is all but inevitable with this choice of technology.

	20Hz	1kHz	20kHz
Channel Balance	0.00dB	0.00dB	0.02dB
Channel Separation	135.6dB	129.3dB	104.7dB
THD vs Level, 0dB	-98.0dB	-97.0dB	-85.6dB
-30dB	-78.7dB	-76.4dB	-80.2dB
-60dB	-55.9dB	-50.6dB	-59.5dB
-80dB	-28.0dB	-30.3dB	-41.4dB
Dithered, -90dB	-17.5dB	-21.3dB	-31.6dB
Dithered, -100dB		-20.2dB	-13.5dB
Dithered, -110dB		-0.01dB	0.00dB
Resolution @ -60dB			
-80dB			+0.14dB
-90dB			-0.17dB
-100dB			+0.10dB
Peak Output Level, L			2.165V
R			2.165V
Relative Output Level			+0.69dB

TEST RESULTS

Output Impedance	9.3ohm
Radio Frequency Spurious	1mV broadband +13.6dB
1Hz Noise Modulation	-95.5dB
CCIR IMD, 0dB	-96.5dB
Suppression of stop-band IMD	96.5dB
De-emphasis Accuracy, 1kHz	+0.03dB
5kHz	+0.10dB
16kHz	-0.65dB
S/N Ratio (A-wtd), w emp, 0LSB	115.6dB
w/o emp, 0LSB	113.0dB
w/o emp, 1LSB	113.0dB
Digital Output	Coaxial
Crystal Clock Accuracy	+5.0ppm
Track Access Time (99)	see text
Typical Retail Price	£999



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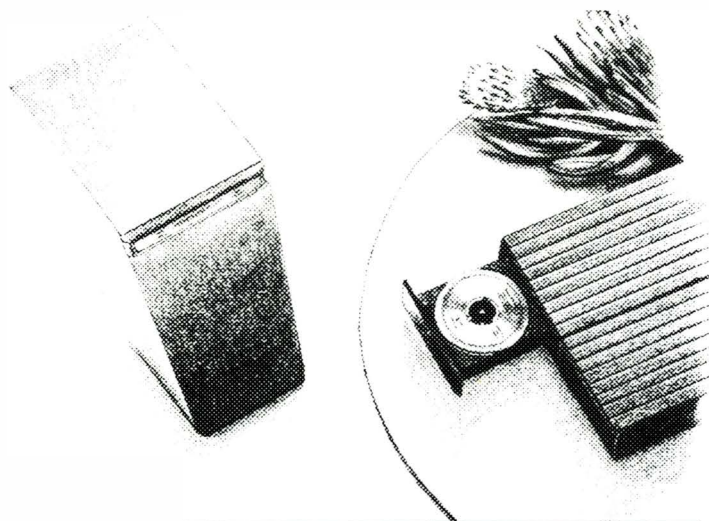
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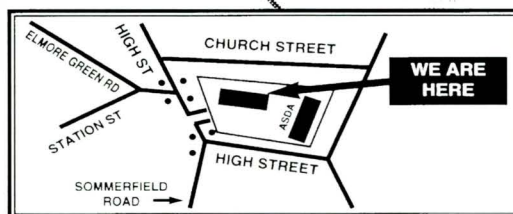
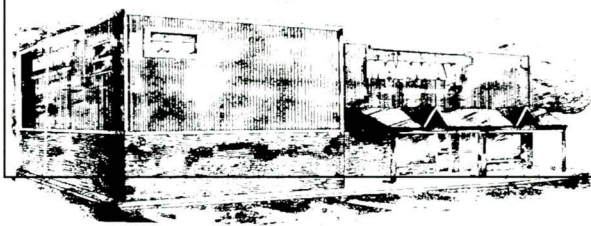
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Linn Karik



Long before the *Karik* CD transport was launched the prospect of a *Karik* CD player was already a twinkle in Linn's eye, for all its latest products have been conceived with possible future modification in mind. As a result the unit has always had provision for a DAC board, in this instance a few square inches of PCB that plays host to a Crystal bitstream converter.

The transport mechanism is not manufactured entirely in-house but is based upon a standard Far Eastern 3-beam linear tracking laser assembly. This assembly has been 'tinkered with' to improve reliability and immersed in an alloy housing of Linn's own design, its lightning-quick drawer being a key feature.

Meanwhile, the supplementary DAC board extracts a very stable clock feed from the transport's master oscillator, us-

ing a screened coaxial cable that's kept separate from the power supply and data lines. This, plus a surfeit of surface-mount components, indicates the *Karik* is technologically bang-up-to-date.

Sound quality

In general terms this player has an expansive but slightly dry and airy balance with no artificial euphony to cloud the natural sparkle and perspective of the music at hand. This big and confident presentation drew out the natural scale and energy of Arnold's *Viola Concerto*, projecting stable and tightly focused images without the very distant perspective we'd endured earlier in the day.

A combination of spaciousness, substance and impact made all the difference to our Prokofiev disc, which possessed a drive and spirit readily lost by cheaper

players. There was now the sense of somebody actually hitting a bass drum rather than subjecting us to an amorphous wash of bass.

Tonal subtleties proved equally explicit, contrasting the seductive and aggressive tones of Mary-Chapin Carpenter. Similarly the differences between the right and left hand of the accompanying piano were equally clear, another refinement missing with so many other players.

Conclusion

Here is a player that seems to thrive on the challenge of unravelling the most convoluted of musical styles, for its music retains a stubborn grip on both dynamics and tone rather than collapsing in a fuzzy heap. This dignified performer is one of the few so-called 'high-end' players to justify its price; strongly Recommended.

Contact

LINN PRODUCTS LTD.
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041 644 5111

Verdict

- +** Basic DAC makes the most of an advanced CD transport.
- Perhaps a little too dry for some systems. Expensive.
- ▶** **£1,497.00 RRP**

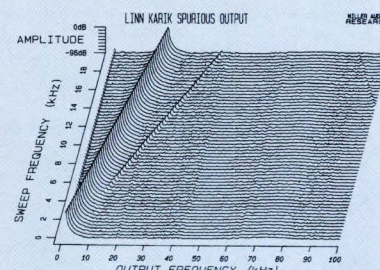
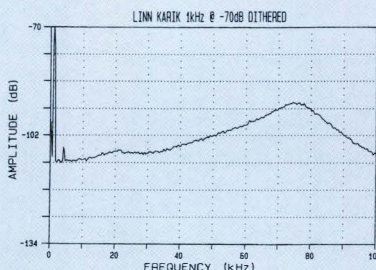
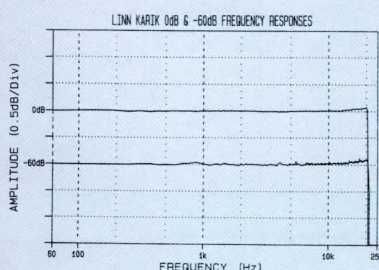
LAB REPORT

Regular readers might care to refer back to Roksan's ROK-DA1 convertor in issue 113 which was one of the very first to feature the Crystal CS4328 bitstream DAC. The plots recorded here obviously bear a strong resemblance, especially the -70dB trace which highlights the bumpy ultrasonic noise floor reaching a peak around 75kHz before the built-in filter and MOSFET output stages begin to bite. The unusual contouring of this trace is specific to the fifth order noise-shapers and limited 64 times oversampling.

However, Linn's application, with its surface mount LM837 op-amp, squeezes THD from 0.07 per cent (Roksan) down to 0.005 per cent at 20kHz. Otherwise the good distortion performance at lower levels, excellent low-level linearity and relatively poor 96dB S/N ratio are all entirely characteristic of the CS4328 itself, not the implementation.

TEST RESULTS

Channel Balance	20Hz	1kHz	20kHz	Output Impedance	101ohm
Channel Separation	0.04dB	0.04dB	0.08dB	Radio Frequency Spuria	11mV @ 67MHz
THD vs Level, 0dB	110.5dB	104.5dB	77.6dB	1Hz Noise Modulation	+0.9dB
-30dB	-99.6dB	-98.2dB	-85.3dB	CCIR IMD, 0dB	-80.5dB
-60dB	-94.3dB	-78.9dB	-63.2dB	Suppression of stop-band IMD	100.5dB
-80dB	-61.2dB	-48.6dB	-32.8dB	De-emphasis Accuracy, 1kHz	-0.18dB
Dithered, -90dB	-33.5dB	-27.8dB	-13.2dB	5kHz	-0.17dB
Dithered, -100dB	-18.0dB	-17.7dB	-2.50dB	16kHz	-0.17dB
Dithered, -110dB		-10.7dB		S/N Ratio (A-wtd), w emp, 0LSB	117.6dB
Resolution @ -60dB		-6.50dB		w/o emp, 0LSB	117.3dB
-80dB		-0.02dB	0.00dB	w/o emp, 1LSB	96.3dB
-90dB		-0.34dB	-0.22dB	Digital Output	BNC/Optical
-100dB		-0.38dB	-0.73dB	Crystal Clock Accuracy	-6.3ppm
Peak Output Level, L		-0.60dB	-0.75dB	Track Access Time (99)	4.5secs
R		2.021V		Typical Retail Price	£1,497
Relative Output Level		2.011V			
		+0.07dB			



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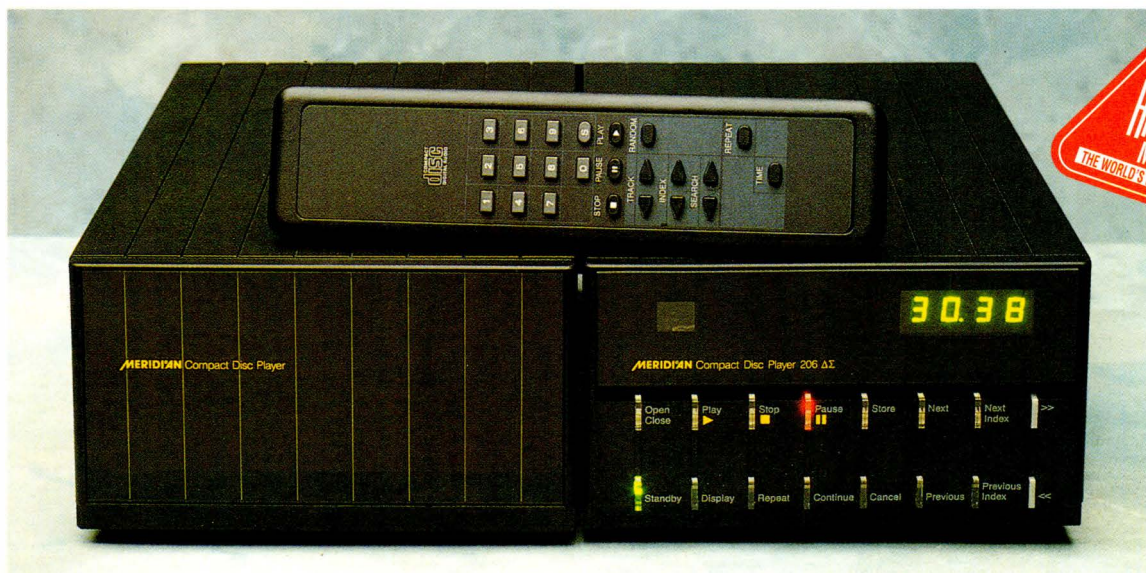


Reviewers comments on the Unisis integrated; "From top to bottom this is a remarkably well engineered amplifier. Appearance doesn't substitute for performance." Noel Keywood, HiFi World.
"Most valve amplifiers present the bass about half a beat behind the treble. The Unisis played both with spot-on timing accuracy" Alan Sircom, HiFi World, August 1992.



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Meridian 206 $\Delta\Sigma$



Since the dawn of digital time, Meridian has been associated with Philips, a partnership recently severed by the launch of another 206 variant, the £995 206 Delta-Sigma, spurning DAC7 in favour of Crystal's flavour of the year CS4328 bitstream chip.

Outwardly there's little change, the siamesed two-box construction, restricted display, and ordered rows of function keys contribute to an inimitable style. Inside, however, a new twin-processor servo board will now accept 'stacked' instructions, so commands can be over-ridden if you make a mistake or change your mind through a sequence of keystrokes.

New servo software improves the 206's handling of defective CDs while prompting the DAC's auto recalibrate facility every time a disc is stopped or loaded. Crystal's DAC has already been

used to good effect by Roksan, EMF, and Linn though Meridian's four-layer partitioned board with multi-regulated supplies, large Nichicon MUSE and polypropylene decoupling caps plus discrete Class A output buffer is unique.

Sound quality

This player delivered a positive, sure-footed sound without being forward or hyped-up. Unprompted, our panel likened this confidence to the Linn even though it tempers the Karik's dryness with extra warmth, ambience and roundedness. Music flows in an undemanding, natural way, sobering-up bass lines that seemed to plod or stagger with many lesser players.

Pop and vocal selections were "well lit" and "brilliant", the snap of strings and decay of piano, all executed in a clear yet methodical manner without sterility. All

pieces of music had a sense of controlled and focused power, the player seemingly unfazed by the most arduous of styles. This was exemplified by Arnold's *Viola Concerto*, a distant and barely accessible piece of music that maintained the interest of our panel with subtle counterpointing and twists and turns of strings and woodwind — often vague and imprecise on more mundane players.

Conclusion

The DAC7 version of this 206 earned Meridian little approbation in issue 107, a situation utterly reversed by the switch from Philips to Crystal bitstream technology. The result is a familiar more user-friendly player that delves deeper into the architecture of the recording without detriment to the music itself. A Best Buy for Meridian seems appropriate.

Contact

MERIDIAN AUDIO LTD,
14 CLIFTON ROAD,
HUNTINGDON,
CAMBS PE18 7EJ

0480 434 334

Verdict

- +** Quite the most expressive of all Meridian's players.
- Transport is cumbersome by modern standards.
- ▶** **£995.00 RRP**

LAB REPORT

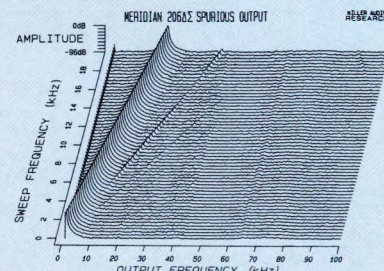
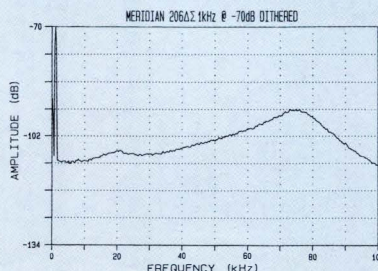
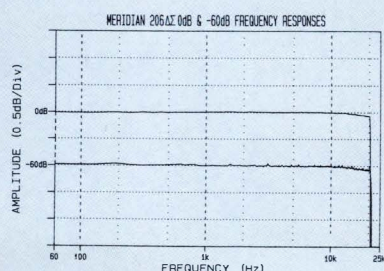
What we have here, on the whole, is a collection of measurements that more closely resemble the Roksan ROK-DA1 (issue 113) and Linn Karik than the previous version of the 206B (issue 107). The change from DAC7 to CS4328 is immediately reflected in the -70dB plot which demonstrates the greater effectiveness of the Crystal fifth order over the Philips third order noise-shapers when both are run at a common 11.3MHz master clock frequency.

Distortion is not as low at low and mid frequencies as with the DAC7 chipset, yet this Crystal version has a clear advantage in the treble, suffering 0.0063 instead of 0.021 per cent at 20kHz. Also, what distortion exists is principally 2nd-order (see 3D plot), a character maintained by intermodulation as well as harmonic distortions. However, a 97dB S/N ratio is far weaker than possible with DAC7, as are the 1dB deviations in linearity below -90dB.

	20Hz	1kHz	20kHz
Channel Balance	0.03dB	0.03dB	0.00dB
Channel Separation	109.8dB	108.6dB	77.8dB
THD vs Level, 0dB	-103.3dB	-98.6dB	-84.0dB
-30dB	-90.1dB	-79.4dB	-64.7dB
-60dB	-53.4dB	-49.2dB	-34.2dB
-80dB	-22.9dB	-26.9dB	-14.8dB
-90dB	-15.8dB	-18.5dB	-5.50dB
Dithered, -90dB			-10.7dB
Dithered, -100dB			-5.50dB
Dithered, -110dB			0.00dB
Resolution @ -60dB			0.00dB
-80dB			-0.25dB
-90dB			-1.05dB
-100dB			-1.00dB
Peak Output Level, L			2.203V
R			2.195V
Relative Output Level			+0.82dB

TEST RESULTS

Output Impedance	46.0ohm
Radio Frequency Spurious	4mV @ 11.3MHz
1Hz Noise Modulation	+1.6dB
CCIR IMD, 0dB	-80.5dB
Suppression of stop-band IMD	96.2dB
De-emphasis Accuracy, 1kHz	-0.02dB
5kHz	-0.02dB
16kHz	-0.01dB
S/N Ratio (A-wtd), w emp, 0LSB	101.2dB
w/o emp, 0LSB	97.0dB
w/o emp, 1LSB	97.1dB
Digital Output	Coaxial/Optical
Crystal Clock Accuracy	+5.0ppm
Track Access Time (99)	5.5secs
Typical Retail Price	£995



Sugden SDT-1



With the experience of its *SDA-1* and *PDA-10* outboard converters (issue 113) now firmly tucked under its belt, Sugden has released a fully-fledged integrated CD player, the £950 *SDT-1*. External appearance is dated but certainly rugged and includes a limited selection of controls for track skip, play, pause and stop. A primitive remote control (a renegade from the Philips parts bin) adds both repeat and shuffle play facilities but not direct track access.

A green filter serves to disguise a standard Philips display, while yet another CD Engine II package from Philips Industrial Supplies is found inside. In this instance it includes a posh (version 44) CDM9 mechanism, complete with a felt-covered loading tray and separate servo and decoder/digital output boards, onto which Sugden has grafted a new micro-

processor and condensed version of its *SDA-1* DAC — the only traditional 16-bit design in our entire test.

Sound quality

There's an immediacy about this player, an uninhibited and fresh sound that swells in response to the dynamics of the music, prompting one listener to remark: "what you hear is what you get" in response to the forthright and honest sound. A good deal of huskiness was heard from our vocal selections, a realistic rasp that was readily glossed over by other players.

By contrast Arnold's *Viola Concerto* sounded distant and reduced in scale even though it was still intricately focused and detailed. This was our first inkling of the player's fickle character, its appreciation of stereo space varying from track to track.

The agitated disposition of its sound

confused the order and form of our Prokofiev selection. Any rhythmically complex piece of music involving massed strings, brass or percussion is likely to become blurred as different instruments run into one another. Yet simpler pop tracks are just as likely to sound solid, open and dynamic. All told, a very mixed result.

Conclusion

First impressions can be misleading, as the *SDT-1* served to demonstrate. This player has a tendency to reduce the scale and atmosphere of its music without necessarily compromising the overall sense of detail. The high levels of clock noise and jitter encountered during the lab tests may well tally with the reservations of our (blind) listening panel. The sheer sonic unpredictability makes the *SDT-1* something of an expensive gamble.

Contact

J E SUGDEN & CO LTD,
VALLEY WORKS,
STATION LANE,
HECKMONDWICKE,
WEST YORKS
WF16 0NF

0924 404 088

Verdict

- +** Capable of some thrilling dynamics with the right CD.
- Circulating interference makes it unpredictable.

▶ **£950.00 RRP**

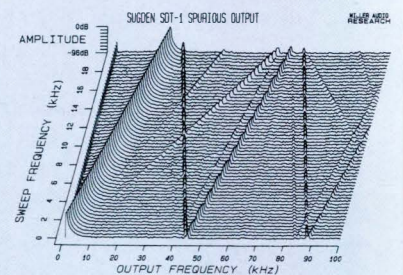
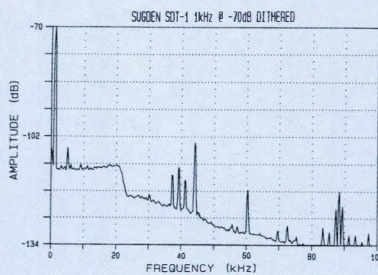
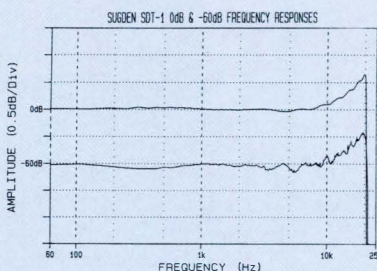
LAB REPORT

The 16-bit heritage is clear from the graphs, especially the 3D plot which shows the rippled V-shaped stop-band images typical of Philips SAA7220P/B four times oversampling filter. Similarly, the TDA1541SI (Crown) DAC betrays the customary 'multi-bit lurch' in distortion from just 0.003 per cent at 0dB to 0.044 per cent at -30dB, with 3rd order IMD at a high 0.057 per cent.

These features, plus the -5.5dB kink in linearity at -90dB, the 'bright' treble (+0.68dB at 20kHz) and high +15dB noise modulation were also a feature of Sugden's *SDA-1* convertor (Issue 113), although the *SDA-1* was free of the high 11.3MHz clock noise and substantial jitter sidebands present either side of low-level (cf -40dB and below) high frequency signals. In this instance spurious sidebands occurred at +/-3.575kHz (-40dB to -70dB) and +/-1.075kHz (-70dB to -100dB), equivalent to -33dB at -60dB or 2.2 per cent IMD.

TEST RESULTS

	20Hz	1kHz	20kHz	
Channel Balance	0.14dB	0.13dB	0.08dB	Output Impedance
Channel Separation	113.8dB	85.5dB	75.1dB	Radio Frequency Spurious
THD vs Level, 0dB	-96.8dB	-90.5dB	-70.7dB	35mV @ 11.3/22.6MHz
-30dB	-71.6dB	-67.1dB	-59.8dB	1Hz Noise Modulation
-60dB	-43.2dB	-43.9dB	-35.2dB	CCIR IMD, 0dB
-80dB	-18.6dB	-21.3dB	-34.2dB	Suppression of stop-band IMD
-100dB	-4.50dB	-11.2dB	-24.5dB	De-emphasis Accuracy, 1kHz
Dithered, -90dB				5kHz
Dithered, -100dB				16kHz
Dithered, -110dB				S/N Ratio (A-wtd), w emp, 0LSB
Resolution @ -60dB	+0.04dB	+0.18dB		w/o emp, 0LSB
-80dB	-0.35dB	-0.83dB		Digital Output
-90dB	-5.45dB	-3.75dB		Crystal Clock Accuracy
-100dB	-2.60dB	+1.70dB		Track Access Time (99)
Peak Output Level, L	2.348V			Typical Retail Price
R	2.312V			£950
Relative Output Level	+1.33dB			



Teac VRDS-10



Having already squeezed a Philips Bit Stream DAC into two of its budget CD players, Teac was left with little choice but to upgrade its new flagship model to full DAC7 status. This is the £769 VRDS-10, named in deference to the vibration-free rigid disc-clamping mechanism applauded in its P-500, P-10 and P-2 CD transports.

The sturdy black alloy fascia, the gold sliver of its disc tray and a cautious smattering of facilities lend this machine a purposeful appearance. A small observation window exposes part of the transport 'bridge', from which hangs a brushless motor and the inverted platter. Once loaded, a CD is forced up against the underside of this platter and is read from below, conventionally, by a three-beam laser assembly. This irons out microscopic warps in the CD while preventing the

edges of the disc from flapping as it rotates at speed. Less demand is placed on the servo, focus and tracking electronics, producing a sharper RF eye pattern from the CD and less jitter in the digital datastream.

Sound quality

The sound of this player provoked a mixed reaction from our panel. The most positive found it extremely involving, both in its intimate portrayal of vocals and in the vivid 'stringy' timbre of Arnold's *Viola Concerto*. Prokofiev's *Romeo & Juliet* also bobbed along eagerly, though the overall performance was described as "very high resolution, but cool rather than sweet".

Some also appreciated "the grandeur of its sound", first heard as the confident start of a simple vocal recording, only to be dashed as the performer "opened the throttle". Although the *Viola Concerto*

sounded equally impressive and well-focused, it was a shade on the lean side and slightly brittle in its reproduction of strings. In the same way, our *Romeo and Juliet* selection was also eventually overwhelmed by the sheer intensity of the piece.

The unenthusiastic criticised the VRDS-10 for its glaring vocal quality, its fundamental lack of stereo depth and uniform butchery of musical dynamics and bass weight. Like I said, a very mixed reaction.

Conclusion

Cool, dispassionate and unadventurous or, as one listener put it, "a Fox's glacier mint of a player". All of which is in stark contrast with the machismo of the construction, the bold appearance and bare minimum of facilities. However, the 'blind' panel were not exposed to the psychology of Teac's aesthetics...

Contact

TEAC UK LTD.
5 MARLIN HOUSE,
THE CROXLEY CENTRE,
WATFORD,
HERTS WD1 8YA

0923 819 630

Verdict

+ Very reasonably priced for this quality of engineering.

- Sounds unexpectedly thin and lightweight.

► £770.00 RRP

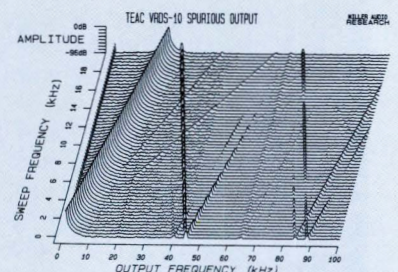
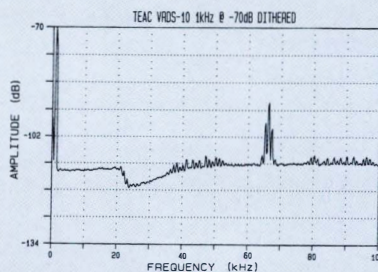
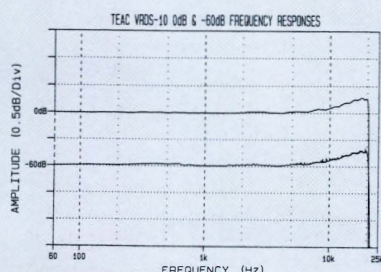
LAB REPORT

Compare these plots with those of the CD-P4500 (issue 107) and CD-P3500 (issue 112) and the VRDS-10's lineage is obvious. Here, however, Teac employs a Philips SAA7350 solely for its virtues as an oversampler and 3rd-order noise-shaper, not for its capabilities as a DAC. Nevertheless it uses the same NPC SM5840 digital filter, which gives the V-shaped stop-band images on the 3D plot and the rippled frequency response (-0.43dB @ 20Hz and +0.33dB @ 20kHz).

The double-differential operation of the two DAC7 bit convertors reduces THD from typically 0.0013-0.014 to 0.00056-0.0025 per cent and improves low-level linearity from errors of -2.4/+4.6dB to just -0.3/+0.4dB. However, the analogue stage is very disappointing, its high 1.1kohm output impedance represents a drop in signal level of nearly 1dB into a standard 10kohm load, suggesting the VRDS-10 is likely to be both cable and amplifier sensitive.

TEST RESULTS

Channel Balance	0.08dB	0.08dB	0.17dB	Output Impedance	1.14kohm
Channel Separation	127.5dB	131.6dB	114.5dB	Radio Frequency Spurious	3mV @ 135MHz
THD vs Level, 0dB	-104.6dB	-99.3dB	-92.1dB	1Hz Noise Modulation	+7.0dB
-30dB	-90.0dB	-81.1dB	-73.2dB	CCIR IMD, 0dB	-95.5dB
-60dB	-56.2dB	-49.1dB	-45.5dB	Suppression of stop-band IMD	60.9dB
-80dB	-27.8dB	-31.0dB	-27.1dB	De-emphasis Accuracy, 1kHz	0.00dB
Dithered, -90dB	-15.4dB	-21.7dB	-16.3dB	5kHz	+0.05dB
Dithered, -100dB		-20.1dB		16kHz	+0.25dB
Dithered, -110dB		-11.0dB		S/N Ratio (A-wtd), w emp, 0LSB	117.1dB
Resolution @ -60dB		0.00dB	-0.02dB	w/o emp, 0LSB	116.7dB
-80dB		+0.11dB	+0.02dB	w/o emp, 1LSB	106.0dB
-90dB		+0.05dB	-0.32dB	Digital Output	Coaxial/Optical
-100dB		+0.40dB	+0.15dB	Crystal Clock Accuracy	+50.0ppm
Peak Output Level, L		2.164V		Track Access Time (99)	3secs
R		2.185V		Typical Retail Price	£769
Relative Output Level		+0.73dB			



Conclusions, Best Buys & Recommendations

To make life easier we've grouped this selection of CD players into three separate price bands: up to £250, from £250-£500 and, finally, £500 and above. Naturally the players were not assessed category by category but were auditioned completely blind and in a thoroughly random order.

It was only after sorting the results of several days' listening that we discovered the sub £250 category was filled with *Choice* swingtags. The panel had remarked upon the very predictable sound of the budget players, a frustrating lack of variety which meant a substantial sub-group was either Recommended or relegated to 'worth considering' en masse.

With hindsight this might have been anticipated. Most budget players are converging towards a common bitstream technology along with very similar transport mechanisms and analogue circuitry. With more cash to play with, designers of costlier gear can afford to be more adventurous and versatile, a notion confirmed by the diverse tonal flavours offered by AVI, Sugden, Linn and Meridian in our top category. 'Different' does not of course always mean 'better', but does at least add up to a wider variety of choice.

Recommendations and Best Buys below £250

Two sub £250 players were awarded a Best Buy rating. Sherwood's £120 *CD-3020R* is at present available through dealer Richer Sounds and its associated distributor Hi-Fi Direct, which goes a long way towards explaining its very competitive price. This novel bitstreamer adopts a profligate approach to music-making that rides rough-shod over technical niceties while leaving much of the music's heart, soul and atmosphere.

Following in the footsteps of both the 397 and 797, Sony's £180 *CDP-597* is a rare example of excellence in construction, facilities, technical performance and sound quality at an equally excellent price, sounding both intimate and compelling but also forward and exciting, and without the 'boom and tizz' that might be introduced to boost the confidence of a lesser player.

Among the Recommendations, Philips' £150 *CD920* is a cosy-sounding player at a cosy price. Musically understated rather than balmy or ripe-sounding, it's still very listenable bearing in mind the limitations of Philips' new budget DAC.

NAD has chosen to stick with tried-and-tested

bitstream technology in the £220 *502*. This builds on the stability, sure-footedness and detailing of the *5425* although the panel felt the end result sounded a little mechanical.

Marantz has calmed the fiery temperament of its original *CD-52* with the £230 *CD52 MkII* version. The music it creates is full of beans, even if the awesome reputation this machine has gained seems perhaps a tad unrealistic.

Sansui's £240 *CD-X217* sounds altogether warmer and more cautious, yet this latter-day version of the *CD-X311* is a fine choice for enthusiasts who disliked the grainy hardness of early CD players.

Yamaha's £249 *CDX-660* may be tricky to track down, as we heard while going to press that it's likely to be replaced soon. This trimmed-down version of the *CDX-860* has a slower and heavier sound, but one that's no less endearing.

Recommendations and Best Buys £250-£500

Marantz' £300 *CD-52IISE* returns to the eager, frizzy but larger-than-life 'warts and all' presentation of the original *CD-52*. Unfortunately the price of this unabashed enthusiasm climbs from £200 to £300 courtesy Marantz' various modifications.

However, this intermediate price category was really dominated by two players. The £420 *SL-PS840* from Technics fell steaming from a hot production line into the lap of a firm *Choice* Recommendation, while the £470 Pioneer *PD-S901* certainly succeeded in rescuing the reputation of Pioneer's Legato Link Conversion technology. Despite divergent technologies, both share a combination of subtlety, raw power and an unflappable sense of poise.

Recommendations and Best Buys above £500

Meridian's latest £995 *206ΔΣ* exerts an unwavering grip over the trickiest of tunes without strangling the subtlest of emotions buried within its midst. It also sounds astonishingly open and transparent, qualities that held it above any of the other players in this group.

Linn's £1,497 *Karik* is a simple but elegant derivation of its standalone CD transport, a dual-purpose machine that fosters a dry but exceedingly detailed, confident and dignified sound that can be relied upon no matter how arduous the recording.



Best Buy and Recommended Listing

The following chart summarises by price band the various Best Buy and Recommended Compact Disc players tested over the past year. Selected alternatives from earlier review projects are also listed.

Below £250

BEST BUYS

- Sherwood CD-3020 (£120) Although it has little respect for musical convention, what emerges is still remarkably entertaining.
- Sony CDP-397 (£140) Entirely composed of surface-mount components; unsophisticated but enthusiastic sound.
- Sony CDP-597 (£180) Lightweight version of CDP-797 is equally flexible but provides a warmer and smoother sound.
- Technics SL-PG520A (£200) A cracking player. Superb clarity and dynamics, thrilling but musically involving too.
- Technics SL-PS620A (£230) This costlier, tarted-up 520A loses very little in the way of clarity, sparkle or compelling dynamics.

RECOMMENDED

- Aiwa XC-300 (£130) Cheap, cheerful and gratifyingly free of digital 'nasties'; safe rather than thrilling on the sonic front.
- JVC XL-Z452 (£180) A lightweight player with a surprisingly bold and detailed sound. Impressive stuff for the money.
- Kenwood DP-3040 (£180) The sophisticated sound could teach Kenwood's costlier offerings a thing or two.
- Marantz CD-52 II (£230) This replacement for the CD-52SE is less colourful but equally appealing.
- NAD 502 (£220) Updated 5425 has traded spontaneity for a more precise but mechanical style of music making.
- Philips CD604 (£130) Slightly ponderous but weighty-sounding player. Decent sound at a daft price.
- Philips CD920 (£150) Appalling technical record but a surprisingly clean if understated sound.
- Pioneer PD-201 (£150) A genuinely fizzy and exciting sound. Hardly neutral but audacious and entertaining nonetheless.
- Sansui CD-X217 (£240) Sansui's returned to its roots with the balmy and very comfortable sound of this player.
- Sony CDP-797 (£200) Succeeds with its taut imaging, clean and impressive soundstaging. Can seem a little too lean or dry.
- TEAC CD-P4500 (£250) Described as having a certain 'organic warmth', sounds very composed and easy-going.
- Technics SL-PG320A (£140) A remote-less version of the '420A with an equally dry but vivid sound. A good 'un.
- Technics SL-PG420A (£160) Offers an open, transparent and uncommonly fresh sound but a little of the 'magic' is missing.
- Yamaha CDX-660 (£250) Cheaper iteration of the CDX-860 provides a slightly slower and heavier sound.

£250 - £500

BEST BUYS

- Rotel RCD-965BX (£280) An exceptionally refined bitstreamer: transparent, exquisitely detailed and powerfully emotive.

RECOMMENDED

- Arcam Alpha Plus (£420) The 1992-version of a classic 16-bit player with an all-round smoother sound.
- Kenwood DP-7040 (£300) Classy, polished sound from a decidedly refined piece of engineering.
- Marantz CD-52 II SE (£300) A full complement of mods has recaptured the frothy if startling sound of the original '52.
- Musical Fidelity CDT (£500) Oddball player with appalling digital gubbins yet saved by the euphony of its valves.
- Philips CD950 (£350) The first to employ Philips' advanced DAC7 chipset. Sounds very crisp, clear and confident.
- Pioneer PD-S901 (£470) Very refined but confident, crisp and powerful sound, Pioneer' best Legato Link player so far.
- Technics SL-PS840 (£420) Refined but highly detailed and engrossing performance from the fastest, slickest player on the planet.
- Yamaha CDX-860 (£280) Powerful and confident yet delicate and nimble when the occasion demands.

Over £500

BEST BUYS

- Meridian 206ΔΣ (£995) A new variation on the 206 theme with the most liquid and captivating sound to date.

RECOMMENDED

- Linn Karik (£1,497) Based on Linn's original drive, this player sounds dry but very positive, detailed and engrossing.



In-wall loudspeakers

The flush-mounted in-the-wall loudspeaker — hereinafter referred to as a wallspeaker (though maybe ceilingspeaker is more appropriate, since that is where it's as likely to end up in British homes) — is a comparatively new phenomenon. It's already a big success in the US, riding the twin trends towards multi-room installations and surround-sound 'home cinema' systems, but the habit hasn't spread to the UK at all, apart from the activities of a handful of specialist installers.

It's the nearest thing yet to the invisible loudspeaker, which is why it's especially well suited to applications where intrusiveness is a particular handicap and discretion a high priority. And since rather more than half the British adult population stereotypically regards the loudspeaker as one of the least desirable pieces of furniture to clutter up the home, why isn't the wallspeaker becoming big business over on this side of the Atlantic?

The optimistic response is that it will, in time. Certainly consumer electronics trends often get started first of all in the US of A and start spreading over here a year or five later.

Timber and plasterboard

The main reason why UK progress has been relatively slow lies in the different building styles of American and British homes. The wallspeaker is designed to be easily installed into a stud-type wall — a timber frame construction with plasterboard facings, which allows a suitable size hole to be easily cut out by means of drill and jigsaw, and leaves an acoustically useable cavity within. This form of construction has been widely used in the US for many decades, but has only more recently spread to the UK, where much of the housing stock has brick or breezeblock internal partition walls. (Which may well make the ceiling, in between the joists, the feasible alternative.)

Besides this practical constraint, there's also been an almost total lack of media and manufacturer interest in promoting the idea of flush-mount speakers. To my knowledge this is the first British attempt to review wallspeakers; the first to try

and establish the strengths and weaknesses of a potentially interesting and decidedly unconventional hi-fi alternative. UK brands like KEF and B&W do make flush-mount systems, but they are designed primarily for the US market, and neither company seems particularly interested in getting the habit started over here.

I don't know exactly how many British dealers even bother to stock, never mind demonstrate the wallspeaker option, but I suspect it's very few. Those that do so accept that the wallspeaker has limitations, but report that customers show great enthusiasm for its fundamental strength, to enable real loudspeakers to boldly go into realms hitherto dominated by squawking portables.

Acoustic advantage

In its current commercial applications at least, the wallspeaker doesn't yet match a proper pair of audiophile quality loudspeakers in certain important respects, though it does have a singular acoustic advantage and can certainly give the typical bookshelf model a fair run for its money. And there's a crucial advantage in being able to add surround- and multi-room-sound without leaving all the evidence lying around.

Whether that's sufficient to justify a bit of a price premium for little more than a loudspeaker front panel without the cabinet might be debatable, and factors like installation time and long cable runs can add further costs — but these in turn may be offset against not requiring decent speaker stands. However, do bear in mind that the installation is effectively permanent, like a fitted kitchen or bathroom; wallspeakers are definitely for the Dunroamin set.

Engineeringwise the wallspeaker is little more than a couple of drivers and a crossover network mounted on a baffle, with neat grille and frame cosmetics to aid invisibility. But flush mounting per se has useful technical consequences. In a very real sense it approaches the infinite baffle and wall-mount ideals, and should certainly be free from colorations directly attributable to the cabinet itself, from baffle-edge distribution acoustic discontinuities, and from

Swing tags

Products that make the grade are awarded the Best Buy or Recommended accolade.

A product carrying the Best Buy swingtag is of excellent quality and good value for money in its price category.

Recommended products are runners up, but still definitely worth considering within their price bands.



Tech Talk

Although it isn't the only factor that discriminates between the good, the bad and the indifferent, every speaker has a distinct frequency balance which says much about the way it will sound. This is measured in the same room as the listening tests take place, using a far field averaged energy technique which has the disadvantage of adding the characteristics of the room to those of the speaker, but the advantage of being truly relevant to the real world situation.

A single isolated in-room response of a loudspeaker is of limited value, but by carefully following the same procedures over several years, a large database of information allows reliable comparisons to be made, and some of the effects of the room can be taken into account. Two separate sets of room measurements are made, one with the cavity behind the speaker left completely open, the other boxed in at the back, creating a sealed box of about 12litres volume; intermediate cavity sizes will produce more or less intermediate results.

A perfectly flat straight line is not expected. Low frequencies are heavily modified by the main room modes

the interference of the first reflections generated from the wall normally immediately behind a loudspeaker.

The in-wall flush-mount radiates into a hemispherical space (at least up until the point at which walls floor and sidewalls come into play), which will itself reinforce midbass frequencies. Ceiling mounting may well exaggerate this effect by reducing the radiating segment to a quarter or even an eighth of a sphere, depending on where the units are placed.

Since the out-of-phase rear radiation is completely discarded, and the speaker itself will be further away from the listener, a little extra power will be needed to achieve the same loudness at the listening position. Conversely, keeping the speakers as far away as possible will be handy for small rooms and should ensure good drive unit integration over most of the room.

Much less predictable will be the influence of the wall and cavity itself. Quite how a particular wall will react to vibrations created by the drive units is anyone's guess, while the depth and volume of the cavity will also vary substantially from one installation to another.

In the loo sounds

Lacking any form of stud wall in an eighty year old house, but blessed with a corridor and loo immediately behind the wall behind my normal loudspeakers, I constructed a couple of service hatch type openings, able to accept wooden baffles cut for each of the test wallspeakers (and, not coincidentally, just big enough to accommodate a 15inch Tannoy dual-concentric driver; but that's for a future project).

This arrangement will not behave quite like the typical stud wall, even if such exists, but its very high mass and open back (dipole) option should provide the absolute optimum performance conditions, and may well be replicated in practice when a flush-mount is fitted into a ceiling and allowed to back-radiate into a roof void.

The alternative of closing up the back creates a more realistic yet pessimistic scenario, loading the driver with a shallow, damped 12.5litre sealed

— notably the c10dB boost at 30Hz (or 10dB suckout at 42Hz if you prefer) and early reflection modes, which are active well up into the midband for a small speaker close to the wall.

Nevertheless, comparison with listening findings does suggest the ideal balance should be as flat and smooth as possible. Gentle variations are preferable to sharp discontinuities, prominences tend to be more irritating than dips, and a gentle high frequency roll-off usually sounds perfectly acceptable.

Serious Loudness

If you really want to annoy the neighbours and rattle a few window panes then the temptation is to look for a speaker capable of handling loads of watts. This is actually almost exactly the wrong way of going about things as the key to the total loudness capability of a hi-fi system is the loudspeaker's sensitivity rather than the amplifier's power rating.

Basically, the more sensitive a speaker, the more output you will get for a given number of watts. If you have an amplifier feeding a pair of speakers with a sensitivity of say, 89dB, and then, keeping the volume level on the amplifier exactly the same, you change to pair with a sensitivity of 92dB, they will sound twice as loud as the other pair.

Our quoted figures are all taken under identical 'real life' conditions averaged across the main audio band, so genuine comparison is meaningful (unlike the fictional optimism of some manufacturer specs).

The catch is the impedance. A 4ohm load actually draws twice the amplifier current (and hence power) of an 8ohm model for the same volume control setting. So for true comparison subtract 3dB from the sensitivity of a 4ohm to reveal its real conversion efficiency compared with an 8ohm model.

box. Both options were assessed subjectively and objectively, on the assumption that the typical installation will lie somewhere in between.

Though blind auditioning was not feasible in view of the installation complexities, in other respects the review procedure was based as closely as possible on the regular *Choice* loudspeaker tests. The results are therefore largely comparable, placing wallspeakers into context with more conventional boxed rivals.

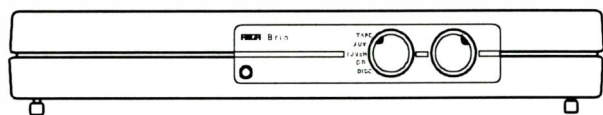
The listening room

The speaker and microphone sites parallel the listening tests, giving a measuring distance of about four metres. The room itself is a sturdily built, sparsely furnished 4.3x5.5x2.6m, with a wooden floor.

One consequence of the room-based testing is that the low frequency extension is defined as much by the room as the loudspeaker. Low frequency roll-off is traditionally expressed as the -6dB, such a technique can be applied with room measurements, but the results tend to be strongly modified by the main room modes.

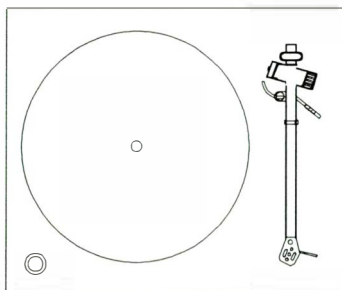
Probably more useful is to specify the relative level of 20Hz ref the midband sensitivity. However, this has the drawback that a good percentage of speakers don't go down much below 50Hz, never mind 20Hz. Until I find a better approach, I am quoting the -6dB points for both open and closed back conditions, plus the 20Hz level.

Products like these can seriously improve your listening pleasure!

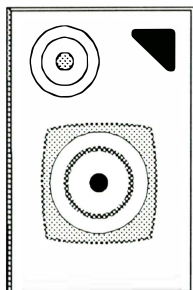


The Rega Brio Amplifier

regal



The Planar 3 Turntable



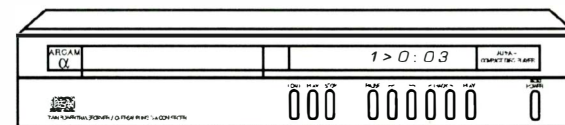
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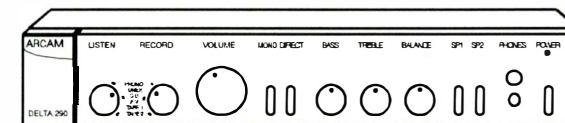
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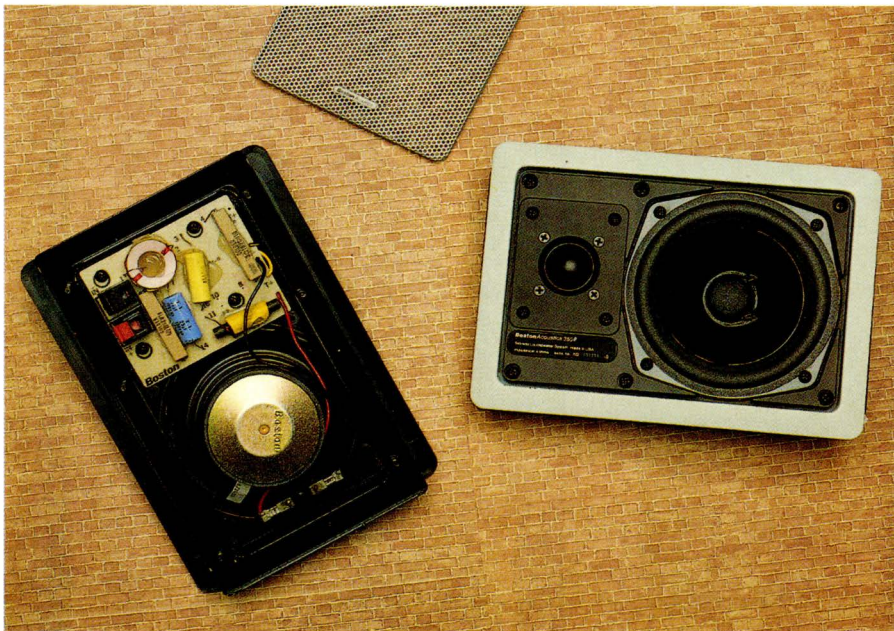
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Boston Acoustics 350



When is a template not a template? When it's a paint-mask, of course. But since I was adopting my usual blunder-in-naively-and-see-what-happens routine, I was well on the way to connecting up these babies when I discovered my carefully cut hole was too small. Five minutes work with the jigsaw restored my equilibrium, though I venture to suggest Boston might clarify this particular element in a manual that is, in other respects most friendly and accessible.

The fact that I'd got so far before the gremlins struck is also evidence of the sanity and logic of this design. You get the bits out of the box and intuitively know at once how it all goes together, because the Boston approach simply makes sense.

The smallest and least expensive of the test group, the £160 350 is the

wallspeaker equivalent of the small c£120 bookshelf miniatures which are the biggest sellers among conventional boxes by a handsome margin.

The small main driver will inevitably compromise sheer welly and loudness capabilities, but what a tiny 90mm plastic cone sacrifices in low end air-moving performance, it usually makes up for with advantages at the top of its working range, where the ear is actually more sensitive.

The overall package of two drivers mounted on a plastic baffle with metal grille is stereotypical enough, the 350's slightly grubby, matt-finished off-white actually proving rather more effective camouflage than the shinier examples. It has nicely radiused edges too, but the best features are found in the less obvious, under-the-skin engineering.

from the slightly dulled top end and mild midbass heaviness. The lack of most of the boxy qualities associated with conventional speakers has to be heard to be believed, as does the sense of scale that can be generated by something so small.

There is some lack of authority, speed and dynamics, especially when fully boxed in, but all things considered the 350 handles power pretty well and gets respectably if not dramatically loud, while maintaining reasonable overall coherence and with little distress.

Conclusion

As long as high levels aren't a first priority and the specific application doesn't conflict with the low impedance, the Boston 350 is a remarkable performer and an obvious Best Buy.

First, the driver mounting baffle is more solid than most (though it still vibrates much more than one would like when playing bass-rich music loudly). Secondly, the mounting system clamps sturdy baffle to even sturdier pressed steel ring; still far from perfect, since the contact area is restricted to two strips above and below, it nevertheless provides a degree of rigidity unmatched elsewhere.

Sound quality

With the area behind the speaker unobstructed, the sound was stunningly effective with wonderful midband openness and unusual neutrality apart



Contact

PORTFOLIO MARKETING,
67 NEW ROAD, LITTLE
KINGSHILL, GT MISSENDEN,
BUCKS HP16 0E11

0494 890 277

Verdict

- +** Beautiful bass-to-mid balance, good build quality.
- Limited power handling, rather tricky amplifier load.

▶ **£160.00 RRP**

TEST REPORT

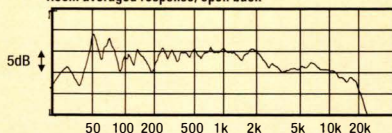
Sensitivity is a very generous 89dB, maintained very evenly across the bass and midrange. Note, however, that the impedance is low throughout much of the bass and midrange too, so although the 350 will deliver its 89dB spl at 1m for a 2.83V (RMS) setting of the amplifier volume control, it will actually be sucking 2W of power out of the amplifier in so doing; the true relative conversion efficiency referred to the sensitivity rating is around 86dB.

The measured frequency balance is remarkably flat and smooth from 50Hz right up to 2kHz, and in-room bass extension is also very impressive indeed, especially considering the high sensitivity, the relative in-room 20Hz output registering -10dB and -17dB for open and closed back conditions respectively. The one criticism comes down to the rather cautious and restrained treble, output falling quite rapidly by some 5dB close to 2kHz, but flattening out again above that point.

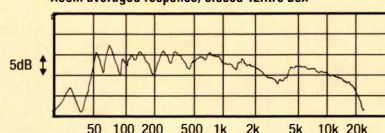
TEST RESULTS

Size (hwxwd)	24x17x7cm
Weight	1.6kg
Recommended amplifier power	20-60W
In room averaged response limits 50Hz-10kHz	±4dB
Open back LF rolloff (-6dB ref midband)	28Hz
12litre cavity LF rolloff (-6dB ref midband)	48Hz
In room output at 20Hz (ref midband), open back	-10
In room output at 20Hz (ref midband), 12litre loading	-17dB
Estimated in-room sensitivity (ref 2.83V, 1m)	89dB
Impedance characteristic (ease of drive)	current hungry
Typical price per pair (inc VAT)	£160

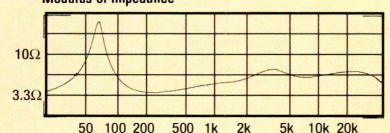
Room averaged response, open back



Room averaged response, closed 12litre box



Modulus of impedance





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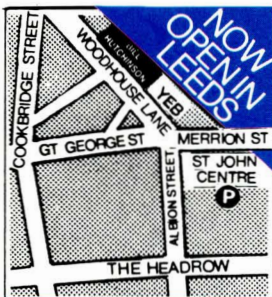
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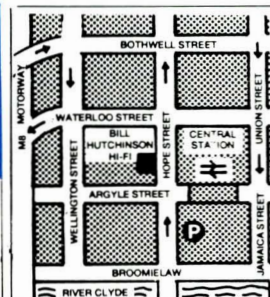
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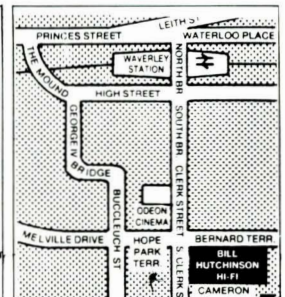
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Boston Acoustics 360



Thirty quid extra on top of the price of its baby 350 brother seems very reasonable in view of the step up in main driver size, and still leaves the £190 360 looking like something of a bargain in the context of the wallspeaker group as a whole, even without taking certain rather superior aspects of its engineering into account.

In almost every respect the 360 is simply an enlarged 350, which means the same impressive mechanical integrity of both the drive unit mounting baffle and the firmly screwed to substantial pressed steel frame means of installation. The latter is very straightforward and logical, helped by informative instruction leaflets.

Although the tweeter looks like the same 28mm soft plastic dome device, if you take the trouble to work out your pis

and r-squareds you'll realise that the main driver's 115mm plastic cone has roughly double the area of its baby brother's. Which is good from the point of view of moving air, if rather less so for cone and baffle structural integrity.

Cosmetics are unobtrusive in the extreme, with softly rounded corners that are easy on the eye and the sort of deliberately dulled finish that will blend rather better than shinier alternatives with walls and ceilings that have lost their initial freshly decorated sparkle. The main driver has a pressed steel frame and fair size magnet, tag connected from a PCB crossover with good components.

Sound quality

The sound quality tracks the measured frequency balance quite accurately, which

means it's pretty even through bass and midband but a little dulled in the treble overall and especially in the presence band. Compared to the 350, the 360 supplies a little more weight and scale, but doesn't have quite the same midrange subtlety and transparency. However, it's still remarkably impressive for an under-£200 loudspeaker, especially if the back is left open to give the main driver the opportunity to 'breathe' properly, whereupon the sound really opens out.

The slightly midbass heavy character is not unpleasant, adding a touch of loudness compensation that's quite welcome at low levels, while the sense of scale is quite remarkable from something so inexpensive. Some extra dynamic vigour and sharper timing might be welcome, but the limitations here are pretty typical of such a two-way compact, and the 360 may be driven to surprisingly high levels without distress. Closing up the box brings the usual loss of scale and openness, but the sound remains well mannered and balanced.

Conclusion

The 360 does suffer slightly from comparison with the smaller, cheaper 350, but its milder impedance makes it rather more flexible for multi-channel/room applications, and it's clearly a very competitive proposition in its own right and thoroughly deserves Recommendation.

Contact

PORTFOLIO MARKETING,
67 NEW ROAD, LITTLE
KINGSHILL, GT MISSENDEN,
BUCKS HP16 0E11

0494 890 277

Verdict

- +** Decent power handling, good balance, easy load.
- Not quite as smooth as the 350, lacks dynamic vigour.

▶ **£190.00 RRP**

TEST REPORT

The measured contrasts between Boston's 360 and 350 are such an object lesson in the trade-offs between medium size and small main drivers that comparison is irresistible. The 360 is actually a shade less sensitive overall, but more than compensates by drawing only half the amplifier current, so the overall conversion efficiency is actually c2dB higher.

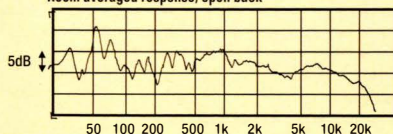
Mounted in the small (12.5litre) closed box, bass extension is very similar, but with the rear of the cone left entirely unloaded the 360 registers 6dB more relative output at 20Hz, at the expense of a little more midbass boom. Note, however, from the impedance curve that the 360's network includes some low frequency electrical trickery, making true comparison tricky.

And although the larger main driver does offer some overall bass improvement, its midrange is significantly less smooth at the top end of its working range, rolling off gently above 700Hz and leaving a mild but broad suckout 2-4kHz.

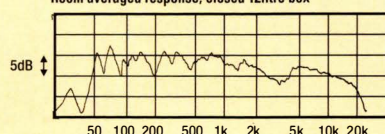
TEST RESULTS

Size (hwxwd)	30.5x22x9cm
Weight	2kg
Recommended amplifier power	15-80W
In room averaged response limits 50Hz-10kHz	±5dB
Open back LF rolloff (-6dB ref midband)	below 20Hz
12litre cavity LF rolloff (-6dB ref midband)	48Hz
In room output at 20Hz (ref midband), open back	-4
In room output at 20Hz (ref midband), 12litre loading	-15dB
Estimated in-room sensitivity (ref 2.83V, 1m)	88dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£190

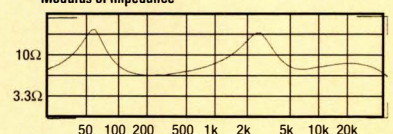
Room averaged response, open back



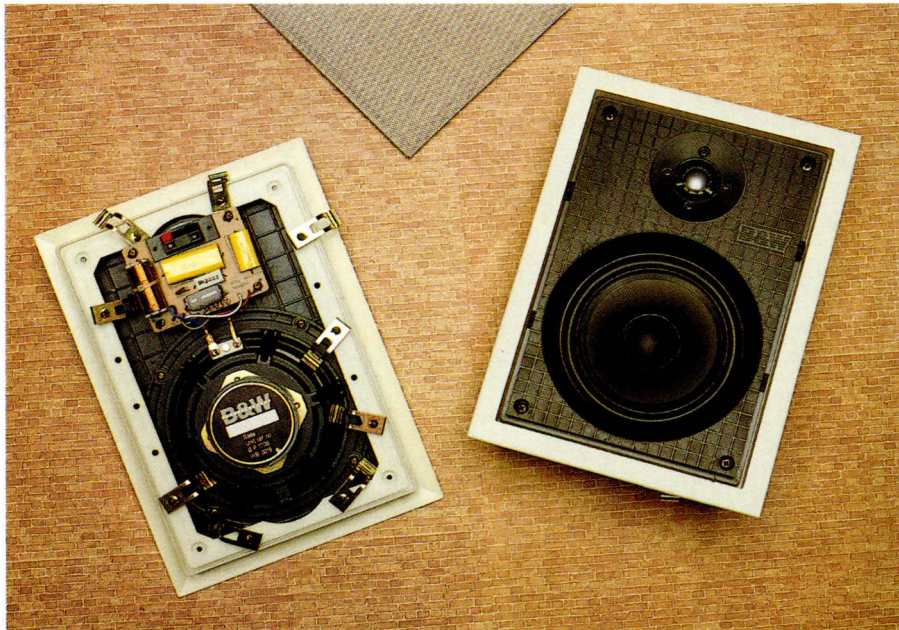
Room averaged response, closed 12litre box



Modulus of impedance



B&W CWM6



The smaller of two B&W Concept 90 flush-mount models, the CWM prefix indicates that this is a Custom Wall Mount model, a name which positively encourages the DIY decorator to do his/her thing with spraygun or ragging on the frame and grille of the speaker itself in order to match whatever decor and camouflage the installation demands.

The CWMs, both included in this report, are very similar indeed to one another, differing mainly in price (by £30) and size of main driver, and baffle. At £190, the '6 looks decent material value for money in the context of the group as a whole. The ingredients are pretty much the typical mixture of plastic mounting frame and baffle assembly fitted with main driver, tweeter and crossover.

A particular luxury touch which distin-

guishes the B&Ws is the use of a cast rather than pressed metal frame for the plastic cone main driver, on this smaller example using a 110mm diameter cone. A neat shaped foam pad fits over the modest magnet and provides simple, effective cavity damping. The perforated metal grille fits onto a plastic frame that clips to the baffle, an elaborate affair that seems a trifle rattle-prone. The tweeter has a 26mm metal dome, and is fed via an overload protection device.

The simple matt white picture frame has slight corner chamfers, and the moulded black baffle is attractively decorated on the front. Some webbed stiffening should aid baffle rigidity, as should the decent fixing screws that operate into threaded inserts, but in practice the baffle still vibrated quite significantly on music

program, and resonated at 70Hz under sine wave drive.

Much like the other British brand KEF, B&W uses a collection of spring clips to hold the mounting frame in place, an arrangement which is usefully flexible, but a bit fiddly and certainly far from the last word in rigidity.

Sound quality

The rather recessed upper midband and presence region tends to dominate the sound quality, leading to a dulling and loss of mid projection that becomes rather tiresome. The treble itself is open and clean, but a shade exposed with it, while the bass is qualita-

tively a shade leaden and heavy, and dynamics not entirely convincing.

With the back open the midband sounds clean and transparent, the sound has generous scale and stereo images focus well, especially in the optimum stereo seat. Closing in the back shuts down a measure of the mid and bass transparency, introducing a touch of thumpiness and making the presence loss somewhat more noticeable.

Conclusion

Although the basic ingredients look promising enough, in practice the CWM6 is a shade disappointing, partly because the sound is dulled in overall balance, but also because the obvious attempts to achieve a measure of mechanical integrity have been only partly successful.

Contact

B&W LOUDSPEAKERS LTD.
MARLBOROUGH ROAD,
LANCING, WEST SUSSEX
BN15 8TR

0903 750 750

Verdict

+ Good material value for money, cast metal frame main driver.

- Overall balance is distinctly dulled with heavy bass.

▶ £190.00 RRP

TEST REPORT

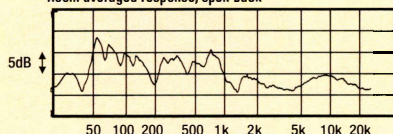
Our in-room measurements indicate an around average sensitivity rating of 87dB is achieved alongside a very easily driven amplifier load, but by way of compensation the bass extension is a shade disappointing in context. The bass is well aligned and shows good tolerance of the wide extremes represented by our two rear loading conditions, which in fact are represented by a shift in the system bass resonance from the 60Hz shown in our open-back impedance curve, up to around 90Hz with 12litre sealed box loading.

The bass-to-mid balance, from below 50Hz to around 700Hz, is impressively flat, but an obvious and quite abrupt step down in relative output level from mid to treble at around 800Hz, which amounts to nearly 6dB, is distinctly worrying. There's some recovery in the mid treble at around 6kHz, but the broad region 800Hz-6kHz — nearly a whole decade wide — looks decidedly depressed, which is bound to have significant subjective consequences.

TEST RESULTS

Size (hxxwxd)	32x23x9cm
Weight	2.1kg
Recommended amplifier power	15-70W
In room averaged response limits	
50Hz-10kHz	±6dB
Open back LF rolloff (-6dB ref midband)	28Hz
12litre cavity LF rolloff (-6dB ref midband)	50Hz
In room output at 20Hz (ref midband), open back	-9dB
In room output at 20Hz (ref midband), 12litre loading	below -15dB
Estimated in-room sensitivit (ref 2.83V, 1m)	87dB
Impedance characteristic (ease of drive)	very good
Typical price per pair (inc VAT)	£190

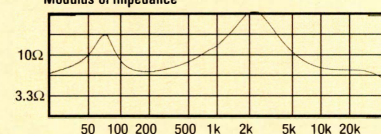
Room averaged response, open back



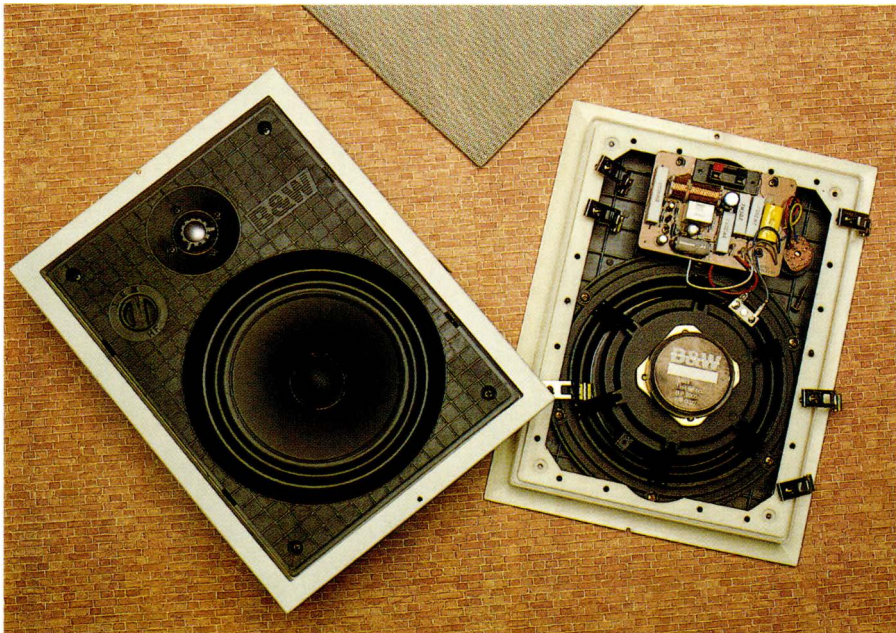
Room averaged response, closed 12litre box



Modulus of impedance



B&W CWM8



but the baffle still vibrates when playing music. A collection of spring clips hold the mounting frame in place, a flexible arrangement which is a bit fiddly and certainly far from the last word in rigidity.

Sound quality

The balance is a bit dull and distant, and the bass a long way from the last word in subtlety and drive. But wall-mounting delivers the usual and refreshing freedom from boxiness, and the tweeter has a sweetness that makes up for the shortfall in analysis which seems likely to be linked to the significant baffle vibration and flexing that's typical of most wall speakers.

Colorations are pretty well under control and stereo images are very well formed and precise. The sound quality was certainly better with the back left unobstructed, but survived pretty well being shut into much smaller confines, continuing to make enjoyable noises even without the full measure of low frequency freedom and extension.

Conclusion

Though not outstanding in any particular respect, and still suffering the structural inadequacies of the breed, the CWM8 nevertheless delivers a well balanced performance overall. I suspect a slightly larger magnet might have helped its case somewhat, but it's certainly one of the better examples of the larger flush-mount models, and is realistically priced to boot.

Slightly larger and thirty quid more expensive than its stablemate, the only other obvious distinction between the two B&Ws lies in a little knob set into the 8's baffle which allows three alternative settings for the high frequency output level (1.5dB steps above 7kHz) — a feature that would perhaps have been more useful if the speaker didn't need all the treble it could get, even when sitting right on-axis.

Details of construction and installation are much the same as for the CWM6. Indeed, increasing the size of the baffle, frame, grille and main driver is only going to make mechanical inadequacies that much more severe, even though the 50 per cent cone area increase should give a corresponding improvement in bass extension and/or sensitivity.

The £220 '8 looks decent material value for money in the group context, consisting of a typical combination of plastic mounting frame which is fitted into the wall or ceiling opening, to which is screwed a baffle assembly fitted with main driver, tweeter and crossover, to which is clipped a white perforated metal grille.

A particular luxury touch which distinguishes both B&Ws is the use of a cast rather than pressed metal frame for the 140mm plastic cone main driver. A neat shaped foam pad fits over the modest magnet to provide some rear damping. The tweeter has a 26mm metal dome, and is fed via an overload protection device on the quite elaborate, tag connected PCB crossover network.

The moulded black baffle has some webbed stiffening, and decent fixing screws



Contact

B&W LOUDSPEAKERS LTD.
MARLBOROUGH ROAD,
LANCING, WEST SUSSEX
BN15 8TR

0903 750 750

Verdict

- + Good sensitivity, easy load, decent material value.
- Some unevenness in the sound and mechanical limitations.

▶ **£220.00** RRP

TEST REPORT

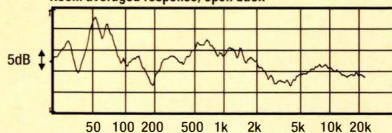
The fact that this is an enlarged variation on the CWM6 theme is confirmed by the measurements. The CWM8 rocks in at close to 90dB sensitivity, and registers a very impressive -5dB at 20Hz if the back is left open (admittedly at the expense of some midbass boom), although these are partly achieved by drawing significantly more amplifier current than its baby brother. Maximum setting on the tweeter level control does create a lowish impedance minimum at 15kHz.

The bass is actually pretty well aligned, though extrapolation of our two extreme measurement conditions does suggest the bigger the cavity behind the better. Elsewhere the response is not particularly even, the treble is rather suppressed even at its maximum setting, and the area around the crossover even more so. But the transitions are relatively gentle, which makes their subjective consequences easier to forgive and accommodate, even though the drop in relative output between 700Hz and 4kHz amounts to a very substantial 10dB.

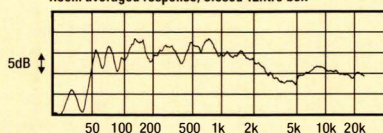
TEST RESULTS

Size (hwxwd)	36x27x10cm
Weight	2.4kg
Recommended amplifier power	20-80W
In room averaged response limits 50Hz-10kHz	±6dB
Open back LF rolloff (-6dB ref midband)	below 20Hz
12litre cavity LF rolloff (-6dB ref midband)	48Hz
In room output at 20Hz (ref midband), open back	-4
In room output at 20Hz (ref midband), closed 12litre box	below -17dB
Estimated in-room sensitivity (ref 2.83V, 1m)	89dB
Impedance characteristic (ease of drive)	quite demanding
Typical price per pair (inc VAT)	£220

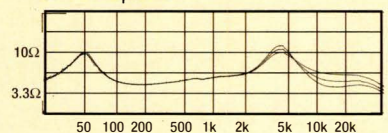
Room averaged response, open back



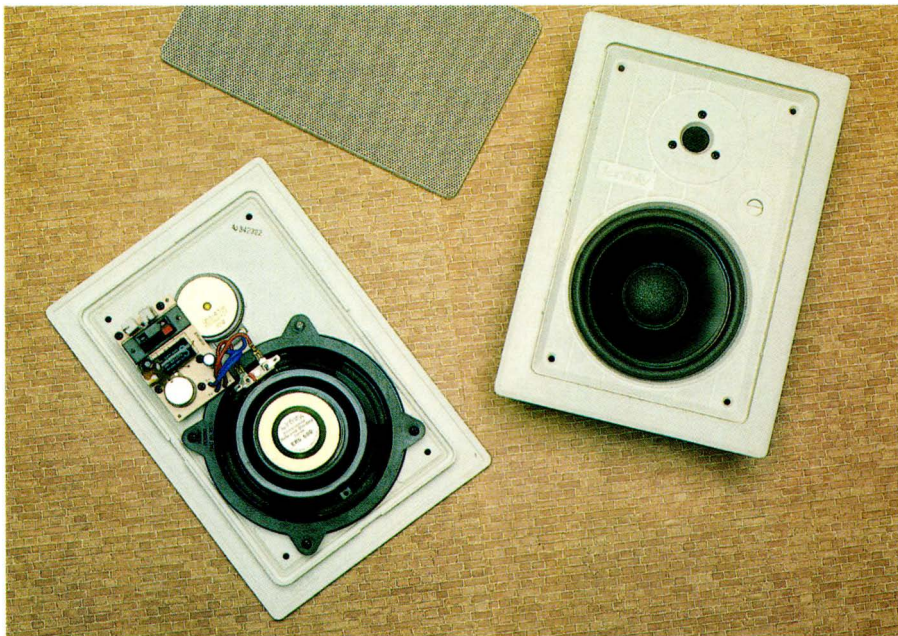
Room averaged response, closed 12litre box



Modulus of impedance



Infinity ERS 600



plastic foam dome with short horn flare. A neat idea is the thin foam sheet between the baffle and the perforated metal grille, which not only suppresses rattles but also adds a small measure of (much needed) low frequency control.

Sound quality

Though some might regard the *ERS 600* as a bit on the bright side, I confess I liked the spacious openness that is partly a function of the well maintained treble output, even if it does come with a slightly spitty quality. The openness is particularly obvious when the back is left unobstructed, even if there is too much midbass

In any group review, especially one covering a completely new and unique type of product for the very first time, there's the moment of truth when you have to get stuck into the randomly selected first samples.

The £300 *ERS 600* from major US brand Infinity was certainly good enough to impress me immediately with a glimpse of true infinite baffle heaven, making me sit up, take notice and approach the project as a whole in a very positive frame of mind. But it's also cursed with (two) sets of (overlapping) instructions that no one should have to try and unravel, along with a pretty comprehensive disregard for mechanical engineering throughout.

The *600* comes as two packages, one containing the baffle-mounted drivers and network and a classy perforated metal

grille. All the visible bits bar the driver diaphragms themselves and a foam grille insert are very prettily finished in squeaky clean white. The other is the installation kit, a curiously toy-like collection of plastic mouldings.

The frame is actually rather larger than the baffle, though less than a third of it is in contact with the opening. It's held by some very silly little plastic clips while the fairly flimsy baffle moulding is attached by four little screws that clamp the whole thing rather tenuously in place. The screws bite only into plastic, with dire warning (in the other manual) not to overtighten them. I didn't, but would have liked to have got them much tighter.

The main driver has a 115mm plastic cone in pressed steel basket, while the level adjustable tweeter uses a tiny 19mm

boom and some lack of control.

However, the fine lack of boxiness created by flush mounting does tend to betray limitations elsewhere. I suspect the squashed dynamics, limited stereo transparency and a degree of time-smearing may well be at least partly a function of the poor structural integrity.

Closing the back of the box shuts everything down rather. The midbass is better balanced but the bandwidth is less impressive and the end result a bit thick and heavy with unimpressive intelligibility.

Conclusion

The *600* is a mixed bag, and an expensive one at that. The mid-to-treble balance is better than most, and the treble adjustment aids flexibility, but the overall performance is mechanically compromised.

Contact

GAMEPATH LTD,
25 HEATHFIELD, STACEY
BUSHES, MILTON KEYNES,
MK12 6HR

0908 317 707

Verdict

+ Bright and attractively open balance, pretty finish.

- Poor mechanical integrity, limited dynamics, some time-smearing.

▶ **£300.00** RRP

TEST REPORT

The modest size main driver and magnet is doubtless responsible for a relatively modest (87dB) sensitivity in view of an impedance characteristic which will demand plenty of amplifier current. It may also explain the rather heavy midbass output, which is particularly obtrusive when the rear is unloaded, and which is still slightly obvious in our small (12litre) enclosed cavity, despite the slight damping provided by the foam grille insert.

Bass extension and the overall frequency balance are both pretty good, the latter holding within tight limits across the band, albeit with a fair amount of local unevenness and a mild suckout (-4dB, 2-3kHz) in the crossover region. There's some logic in providing the variable tweeter level control, since a ceiling installation is quite likely to leave the listener well away from the direct tweeter axis, and a little extra output will provide a measure of compensation — especially since in this case it's sensitively handled (± 2 dB) and only acts on the very top end of the range.

TEST RESULTS

Size (h \times w \times d)	32 \times 22 \times 9cm
Weight	1.6kg
Recommended amplifier power	20-70W
In room averaged response limits	
50Hz-10kHz	± 6 dB
Open back LF rolloff (-6dB ref midband)	20Hz
12litre cavity LF rolloff (-6dB ref midband)	45Hz
In room output at 20Hz (ref midband), open back	-6
In room output at 20Hz (ref midband), 12 litre loading	-15dB
Estimated in-room sensitivity (ref 2.83V, 1m)	87dB
Impedance characteristic (ease of drive)	quite demanding
Typical price per pair (inc VAT)	£300

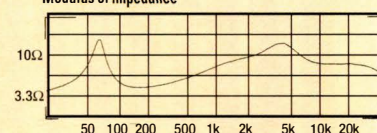
Room averaged response, open back



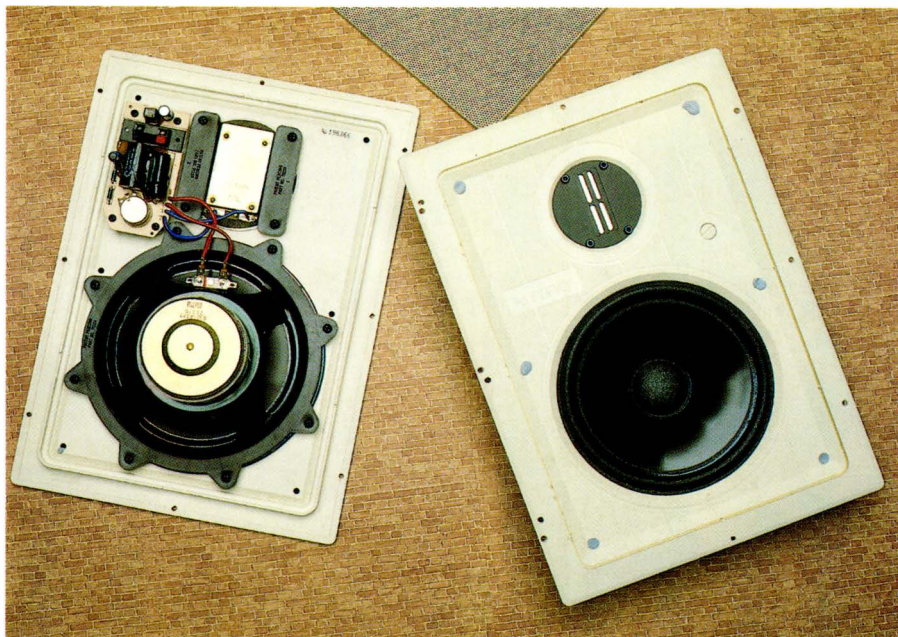
Room averaged response, closed 12litre box



Modulus of impedance



Infinity ERS 800



clip terminals and tag driver connections but heavy wire links.

Sound quality

As one can predict from a glance at the response traces, the back-open option sounds much too bass heavy, and this in turn isn't helped by relatively poor resolution at low frequencies. The sound became altogether better balanced when the rear was enclosed, although unfortunately resolution became even poorer, as the internal pressures created merely serve to worsen the fundamental mechanical limitations of that baffle.

Provided it isn't worked too hard, the 800

The largest and most expensive of this collection of speakers by some margin, the one and only excuse for a £400 pricetag would seem to be the use of a rather exotic ribbon-type tweeter, codenamed EMIT, which certainly costs more to make than the usual standard dome device, and is normally only found in relatively expensive box speakers. The actual diaphragms here are very narrow but a couple of inches long, which ensures good lateral dispersion but a degree of vertical beaming. The orientation of the tweeter vis a vis the intended listening zone therefore needs to be taken into account when installing the speakers, especially if a ceiling installation is envisaged.

That apart, the ERS800 is built along very similar lines to the 600, which means prettily enough but rather flimsily too, a

factor which is not going to be aided by the largest area — and therefore most obviously vibration-prone — front panel of all the tested wallspeakers. To my consternation, I hadn't made my adjustable 'wall hole' quite large enough to accommodate the '800's fixing frame, and resorted (with permission) to drilling the baffle edge to fix it in place. The net result seemed significantly more secure than the Infinity method, but still proved quite unable to counter significant baffle vibration when playing music with bass content.

One consequence of the big baffle is a 150mm plastic cone main driver, which is the largest in our test group, and has a decent size magnet to drive it with too, even though the frame is merely pressed steel. The quite elaborate PCB crossover uses good quality components, with spring

combines authority with good balance and a top end which is sweet and seductive. But when the volume goes up, congestion sets in, constricting the dynamic window across the whole band.

Conclusion

The ERS 800 is the sweetest and (in our small volume enclosure) the best balanced of all the speakers in this group, which does at least go some way towards justifying its high price. But mechanical constraints limit this potentially good performance to applications where only modest levels are required. Turn up the wick and things become progressively less coherent and convincing. It's fine providing day in and out audio support for the family TV set, for example, but don't expect it to rock or to roll with any great success.

Contact

GAMEPATH LTD,
25 HEATHFIELD, STACEY
BUSHES, MILTON KEYNES,
MK12 6HR

0908 317 707

Verdict

- +** An ultra-sweet and high-tech treble drive unit.
- Limited dynamics, poor mechanical integrity.
- ▶** **£400.00** RRP

TEST REPORT

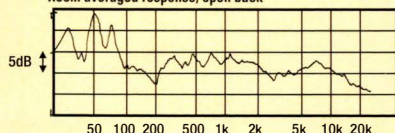
The performance at the upper end of the frequency range is actually rather good, confirming the value of the classy high tech tweeter, but the ERS800's boomy midbass tendencies are even more pronounced than its baby brother's, especially if the rear is left unobstructed. Our small 12litre enclosed volume gave much more satisfactory results, achieving better control at the expense of some absolute extension, but even so the midbass is a shade full, and will become progressively more so with larger rear cavities.

Sensitivity is a satisfactory 88dB or thereabouts, albeit compromised by a low impedance, which has a nasty dip at 5.5kHz if the (± 3 dB) tweeter control is set to minimum, and also falls to a very low level above 15kHz if set to 'max', neither of which will make life easy for the driving amplifier — the mid point looks the safest bet. The mid-to-treble balance is exceptionally good, with only a shallow 2-5kHz depression and a smooth, extended treble.

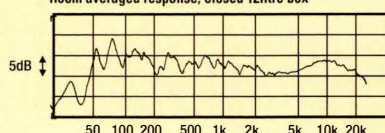
TEST RESULTS

Size (hxwxhd)	40x28.5x9.5cm
Weight	2.4kg
Recommended amplifier power	20-80W
In room averaged response limits	
50Hz-10kHz	± 5 dB
Open back LF rolloff (-6dB ref midband)	below 20Hz
12litre cavity LF rolloff (-6dB ref midband)	30Hz
In room output at 20H (ref midband), open back	-1
In room output at 20H (ref midband), 12litre loading	-14dB
Estimated in-room sensitivity (ref 2.83V, 1m)	88dB
Impedance characteristic (ease of drive)	demanding and tricky
Typical price per pair (inc VAT)	£400

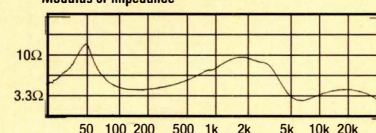
Room averaged response, open back



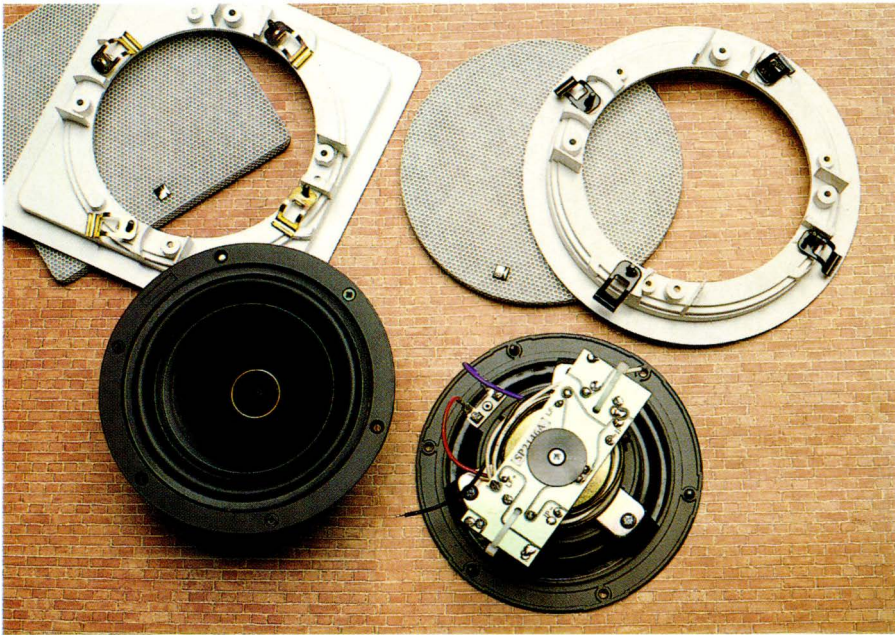
Room averaged response, closed 12litre box



Modulus of impedance



KEF CK160Q S/R



The £219 KEF CK160Q's distinction is that it uses a co-axial drive unit, which mounts a miniature tweeter down the throat of the main bass/mid drive unit and eliminates the need for a driver mounting plate (baffle) in the usual sense of the word. And given that the average flush-mount speaker baffle has just a shade more structural integrity than quick-set yoghurt, this is known as starting off on the right foot.

KEF has been using Uni-Q drivers in regular domestic loudspeakers for some years now, but this is the first flush-mount variation on the theme. The (rather feeble) crossover network is fitted directly onto the main magnet, so the whole thing is a self-sufficient entity built on a nice sturdy cast main driver chassis which has a 110mm plastic cone.

This ready-to-rock module (known separately as the CR160 and priced at £179 per pair) is then mounted into a round (R) or square (S) plastic frame/grille arrangement, which looks cute enough but represents the first source of mechanical compromise.

Much more mechanical integrity is then sacrificed by the four spring clips which are used to 'secure' the mounting frame into the wall or ceiling cutout. Intelligent DIY work could eliminate the frame entirely, which would certainly improve the low frequency performance.

Sound quality

The sound has nice midband coherence and very fine stereo imaging, with relatively mild nasal and cuppy effects. However, the rather strong lower treble does

make itself obvious in a slightly 'thuthy', 'spitchy' coloration on voices which can be irritating, especially on close-miked recordings. The best results are found around 45 degrees off the main forward axis, which should be good for ceiling-mounting installations.

With the back unobstructed the bass is a bit thumpy and ill-defined, with some overall time smear, but the end result is still engagingly foot-tapping and entertaining, if not exactly authoritative and driving. Boxed in at the back, the balance actually improves somewhat, but bass definition takes on a rather dirty sluggish quality.

Conclusion

The CK160Q could fairly be accused of having a little too much character for its own good, would certainly benefit from mechanically better mounting arrangements, and probably some means of adjusting (ie reducing) the relative treble output too for situations where close-to-axis listening is unavoidable.

But these are minor failings compared to the best the CR160 alone can produce. Proper rigid mounting can produce a sound quality to match (or beat) speakers costing more than £1,000 a pair, making a Best Buy rating mandatory for the driver itself. And even using KEF's pretty but mechanically compromised mounting arrangements, it still deserves *Hi-Fi Choice* Recommendation.



Contact

KEF AUDIO (UK) LTD.
ECCLESTON ROAD, TOVIL
MAIDSTONE, KENT
ME15 6QP

0622 672 261

Verdict

+ Exceptional capabilities if driver alone is rigidly mounted.

- A bit bright and edgy, mounting kit compromises rigidity.

▶ £219.00 RRP

TEST REPORT

Much like the baby Boston model, the CR160's main driver has a low impedance voice coil, which draws proportionately twice the amplifier current that an 8ohm resistor would over much of the working band.

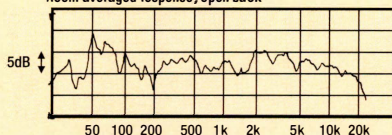
Most modern amplifiers are perfectly happy driving a 4ohm load, so there's unlikely to be any problem when using 160's as normal stereo pairs. However, anyone planning to string together a number of units to cover a really wide area will need to plan the configuration carefully.

The speaker is very well balanced overall, whatever the size of its loading enclosure. The most noticeable departure from neutrality is a broad 3-4dB depression in the upper midband (500Hz-1.5kHz), above which the treble recovers a little, leaving the upper presence band somewhat exposed to listeners close to the main forward axis. Bass extension is adequate to good, depending upon the size of the cavity behind.

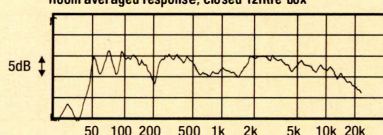
TEST RESULTS

Size (h x w x d)	22x22x9.5cm
Weight	1.4kg
Recommended amplifier power	15-60V
In room averaged response limits	
50Hz-10kHz	±4dB
Open back LF rolloff (-6dB ref midband)	25Hz
12litre cavity LF rolloff (-6dB ref midband)	48Hz
Large room output at 20Hz (ref midband), open back	-8dB
Large room output at 20Hz (ref midband), 12litre box	below -16dB
Estimated in-room sensitivity (ref 2.83V, 1m)	88dB
Impedance characteristic (ease of drive)	current hungry
Typical price per pair (inc VAT)	£219
	(£179 driver module)

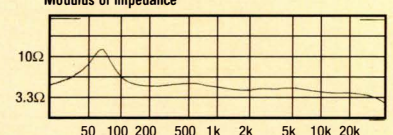
Room averaged response, open back



Room averaged response, closed 12litre box



Modulus of impedance



Conclusions, Best Buys & Recommendations

Despite the elaborate preparation work necessary to undertake this wallspeaker comparison, the end result was fascinating and thoroughly worthwhile. I wouldn't go so far as to describe them as the best thing since instant sliced coffee, but the wallspeaker does have certain clear advantages over the conventional boxed variety, aside from its appeal to the half of the population that hate putting up with black vinyl boxes and trailing wires.

The flush-mount wallspeaker's elimination of both rearward wall reflections and edge-of-enclosure discontinuities gives substantial acoustic advantages, with clearly audible sound quality improvements especially in the midband. The lack of a wooden box avoids another whole raft of colorations, mainly through the upper bass and lower midband. The net result can be, at best, a remarkable cleaning up of the overall sound, with a revelatory lack of boxiness and a low frequency openness and transparency.

Note, however, the qualification 'at best'. Each of the commercial wallspeakers tested here showed, to a greater or lesser extent, significant mechanical limitations, either in a lack of front panel stiffness or limited rigidity in the mounting arrangements — usually both.

The tests replicated two extremes of mounting conditions, one with the back left completely open, the other closed in to create quite a small enclosure. The difference between these two states for any one loudspeaker was often bigger than the differences between one speaker and another, and the bigger the main driver, the wider the variation. The open-back state was usually — though not always — substantially superior. By comparison, closing up the back reintroduces many of the internal reflection and pressure problems that afflict and colour conventional box loudspeakers, and made the mechanical failings of the various fixing arrangements that much more obvious.

All models showed a pretty good range of low frequency alignment between our two extremes, the most flexible being those with small main drivers, because the lighter cone is inherently more stable and controllable at low frequencies, is less affected by the rear loading generally, and the smaller baffle improves mechanical integrity.

Obviously the smaller models lack the theoretical loudness of bigger main driver systems, but the extra agility of a small cone is its own reward, and in practice loudness is more likely to be constrained by the mechanical limitations.

In a nutshell, wallspeakers are great providing you don't demand too much from them. Ask them

to move air or throw a party and they'll politely decline or disappoint. Use them for round the house background/radio/TV work at relatively modest levels and they are delightfully unintrusive, visually and sonically, to the point where going back to conventional box speakers will prove a bit of a struggle.

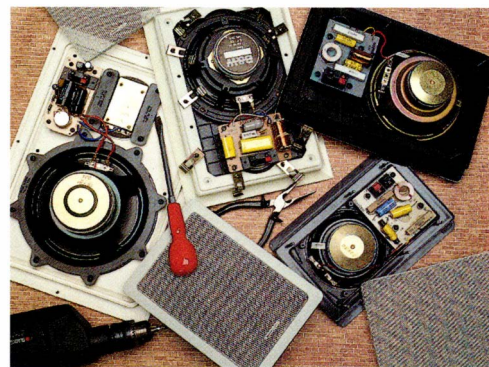
Best Buys & Recommendations

Of the seven wallspeakers covered in this review, four stand out as offering superior performance and/or value for money.

First of these is the cute little £160 **Boston 350**, which has a slightly shut-in, conservative balance, but a superb midband, good tolerance of enclosure variations and mechanical fixing arrangements much better than most. Close on its heels is the £219 **KEF CK160Q**, with a £180 cast-frame coaxial driver (**CR160**) that begs for greater mounting rigidity but otherwise works very well, with good enclosure tolerance and a brightish balance that make it particularly suited to siting where listeners will be well off axis (such as ceilings). Since the whole thing is built on the driver frame, it's a natural choice for the enthusiast willing or able to make his own more rigid fixing arrangements, under which circumstances, with unobstructed free space behind, it can beat the pants off most alternatives up to about £1,000.

The £190 **Boston 360** runs its smaller brother close on quality and versatility, with an impedance better suited to operating more than one unit in parallel (to help cover a wide area). Again, good mounting arrangements lift performance above the norm.

Metal spring clips do not offer such a benefit, but that apart, the £220 **B&W CWM8** is the most satisfactory performer among the larger (and by implication louder) wallspeakers, and is good value for money, offering fine sensitivity and sweet treble alongside a rather laid back overall balance.





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Choice accessories

Let our fine range of accessories help boost your system performance

Isolation cones

Supplied in packs of four, these cones are ideal for supporting just about any item of hi-fi, from sub-woofers through to amplifiers and CD players. The cones provide effective isolation and decoupling, thereby increasing the stereo image and fidelity. Available in precision turned brass or black anodized aluminium, some experimentation will reward the listener with improved sound quality, at a minimal cost.

Order ref: JE12A £14.00

4 Isolation cones (brass)

Order ref: JE11A £14.00

4 Isolating cones (black coated aluminium)

Goldring Magic Record Cleaner

Kit consisting of a double-sided velvet brush and spray on Goldring Magic record rejuvenating fluid.

Order ref: JE13A £11.95

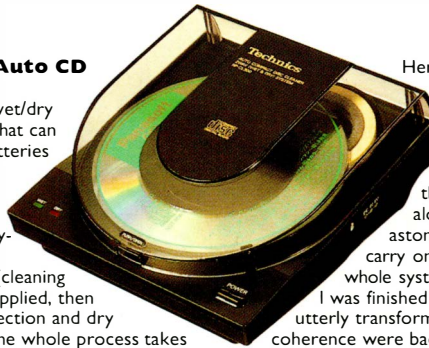
Technics Auto CD Cleaner

A powered wet/dry CD cleaner that can be run off batteries or the mains. It works by rotating the disc and applying the wet cleaner first (cleaning solution is supplied, then reversing direction and dry cleaning it. The whole process takes just 40 seconds and a set of batteries should clean 80 discs.

Order ref: JE20A £39.95

Kontak Cleaning Solution

A two stage contact cleaner for all audio and mains connections. All connections are susceptible to oxidation and contamination which impairs electron flow and thus affects sound quality.



Here's what Paul Messenger had to say when he tried some on his system: "The effect on the power amps alone was so astonishing I had to carry on and cover the whole system. By the time I was finished the system was utterly transformed. Timing and coherence were back with a vengeance; surface noise and coloration were both much less audible and the soundstage had liberated itself from the boxes".

Order ref: JE17A £19.90

The Purifier

A ferrite cable clamp designed to reduce RF induced noise in audio, video and computer systems. The clamps will accept single or multiple cables of up to half an inch in diameter and can be used on both signal and mains cables. Can be particularly beneficial for digital interconnects.

Order ref: JE14A £16.90 per pair

Nagaoka Anti-Static Record Sleeves No102

Packs of 50 plastic record sleeves that can be used on their own or inserted into an existing card or paper sleeve. The sleeves keep records dust free and eliminate static.

Order ref: JE15A £6.99

Gold Plated 4mm Banana Plugs

Top quality solderless gold plated banana plugs for use with speaker cables. Simply push the speaker cable into the body of the plug and tighten for a perfect connection. This Furukawa plug accepts cables up to 4mm in diameter.

Sold in packs of four.
Order ref: JE24A £7.95

Audio Technica CD Lens Cleaner AT-6078

The focusing assembly for the laser head of a CD player is a very delicate affair and yet it requires cleaning from time to time to give of its best. Rather than fumbling about with cotton buds, we would suggest you employ an Audio Technica AT-6978 CD lens cleaner.

This is a standard size disc with a set of eight tiny brushes set into it. To clean your laser, just apply a drop of cleaning fluid on to one of the brushes, place the cleaning disc in to your player and press play.

Ten seconds later, a clean laser assembly and a cleaner sound from your Compact Discs.

Order ref: JE21A £16.95

CD Jewel Case (Five Pack)

Everyone has them, now replace broken CD jewel cases and ensure your discs are properly protected.

Order ref: JE33A £5.00

DISC CLEANING AND MAINTENANCE

Last SF-100 Extra Strength Record Cleaner

Designed to remove the stubborn mould release compounds present in every LP from the pressing process. Use to deep clean new records as well as to revitalise older vinyl.

Order ref: JE25A £22.50

Last SF-200 Record Preservative

Last SF-200 interfaces with the vinyl and prevents gouging, fracturing and wear of the groove wall. A single application will maintain LPs in 'brand new' condition for 200 plays or more. The use of Last 100 and 200 improves fidelity and maintains precious LPs.

Order ref: JE26A £25.00

Last SF-300 Record Cleaner

SF-300 is the cleaner to use on a day-to-day basis on LPs which have been treated with SF-100 and SF-200.

Order ref: JE27A £18.50

Last SF-600 CD Clean And Protect

Yes CDs do need cleaning and Last have introduced a specially formulated cleaner and polish for CDs which removes grease, dirt and finger marks. The kit provides vinyl covers for the continued protection of cleaned CDs. Clean CDs sound better.

Order ref: JE29A £20.00

Last SF-601 CD Cleaner

Exactly the same as CD-600, but without the vinyl protective covers.

Order ref: JE30A £16.00

Last RCM Record Cleaning Machine Fluid

Last Record Cleaning machine fluid is formulated for use in conjunction with proprietary record cleaning machines, for the removal of grease, dirt and grime from Vinyl LP's.

JE35A £18.00

In order to introduce vinyl users to a meaningful protection and maintenance system, we have negotiated a special price on a full size bottle of SF-100 and SF-200 (SC012) complete with applicators for just £38.50. **Trial Pack, SF-100 And 200 (Full Size) Order ref: JE31A £38.50**

We've also secured trial samples of all three products, SL-123 and these are available at only £26.00. We sincerely recommend the use of these products to all who wish to maintain their record collections in pristine condition.

Trial Pack, SF-100, 200 and 300 Order ref: JE32A £26.00

HI-FI CHOICE SWEATSHIRTS

Improve the sound of your system for a mere £15

Ever wondered why some people get taken seriously in hi-fi shops while others get the runaround? Wonder no more. The answer to all your hi-fi problems is the ALL NEW Hi-Fi Choice Sweatshirt.



These gloriously hip garments are tastefully printed in white and red on navy blue. As well as being this year's most crucial fashion accessory, a Hi-Fi Choice sweatshirt will readily identify you as a reader of Britain's fastest growing hi-fi magazine.

As a result you'll almost certainly be taken more seriously and end up with a better system - and all for a mere £15.

We can supply the shirts in two sizes - large and extra large.

Order ref: JE22A

Best seller!

Special offer

Choice sounds

Choose from our superb selection of specialist label recordings.

KLAVIER

MASSENET: BALLET MUSIC 'LE CID' & SCENES PITTORESQUES. THE BIRMINGHAM SYMPHONY ORCHESTRA, LOUIS FREMAUX CONDUCTING.

The ballet provides the opportunity for much seductive, exotic and Spanish flavoured music and includes wide contrasts in dynamics. This is probably the recording of Le Cid, and it's available on 180 gram vinyl or CD. Includes: MASSENET: Scenes Pittoresques - OFFENBACH: La Belle Helene. - MASSENET: The Last Sleep of the Virgin from 'La Vierge' - BERLIOZ: Minuet of the Will-O-The-Wisps.

Order Ref: **KCD-11007** £13.99
K5-522 180gm HQ LP £25.00

PIPE ORGAN SPECTACULAR: THE GREAT ORGAN OF LIVERPOOL CATHEDRAL

Can you find the 16 cycle note? The Liverpool organ is the largest Cathedral organ in the world. Will your woofers cope with this? Take care to set your volume control properly on the first play. The CD contains: LISZT: Fantasy on 'B-A-C-H' - REGER: Benedictus. - REGER: Tocatta in D minor. - REUBKE: Sonata on the 94th Psalm. - FRANCKL Choral in A minor: Finale, Op.21.

Order ref: **KCD-11036** £13.99

OFFENBACH OVERTURES: THE BIRMINGHAM SYMPHONY ORCHESTRA

The ebullient Offenbach overtures (including the CAN-CAN!) are played here with precision and verve that few orchestras can match. The CD contains: OFFENBACH: Orpheus in the Underworld. - The Grand Duchess of Gerolstein. - La Belle Helene - Barbe-Blue & La Vie Parisienne. BERLIOZ: Overture to 'Roman Carnival.' Op.9.

Order ref: **KCD-11040** £13.99

CINCEPINATI WIND SYMPHONY: EUGENE COPORON

Here's one to demonstrate your equipment. Try the Copland/Hinsley (track four). The Candido overture is an outstanding recording. The CD contains: BERNSTEIN/GRUNDMAN: Overture to Candide. - SCHUMAN George Washington Bridge. - COPLAND: An Outdoor Overture. - COPLAND/HINDSLEY: Salon Mexico - SCHUMAN: Chester - REED: La Fiesta Mexicana.

Order Ref: **KCD-11048** £13.99

KLAVIER SAMPLER

Hear some of the best KLAVIER Classical and Jazz titles on this cost-effective sampler.

Order ref: **KCD-1990** £13.99

REFERENCE RECORDINGS

BACH: ALBERT FULLER

Bach wrote for an instrument which is now so rare as to be almost unknown; the Harpsichord. Albert Fuller is one of the world's leading exponents of this most expressive instrument. Listen to Bach on the instrument for which he wrote the compositions. BACH: Italian Concerto. - Prelude & Fugue in f minor, WTC 11. - Prelude & Fugue in D, WTC 11 - French Suite No.6 in E - Anna Magdalena Bach Notebook-1725.

Order ref: **RR-51CD** £13.99
RR-51LP £21.50

TRITTICO: THE DALLAS WIND SYMPHONY

An HDCCD Recording. Trittico is the first Dallas Wind Symphony Recording to receive the patented HDCCD recording system. (see HFC No 117, 4/93 for details). As with all HDCCD discs, this recording displays superi-

or resolution and spatial characteristics. VACLAV NELHYBEL: Trittico - ISAAC ALBINEZ: Feast day in Saville. - NORMAN DELLO JOIO: Variants on a Medieval Theme - EDVARD GREIG: Funeral March for Rikard Nordraak.

Order Ref: **RR-52CD** £13.99



THE OXNARD SESSIONS BOL 1: MIKE GARSON.

An HDCCD Recording. Mike Garson is the quintessential keyboardist and composer whose most famous collaboration to date was with rock star David Bowie. "Mike Garson is the best rock and roll pianist I know" commented Bowie after working with him on 'Alladin Sane'. This CD contains two recordings which were pre-HDCCD, hear the difference!

Order ref: **RR-53CD** £13.99

HD COMPATIBLE SAMPLER.

An HDCCD Recording. The HDCCD process provides a recording that is at least equal in resolution and freedom from distortion to the finest analogue master tapes, yet is compatible with all CD playback equipment. Hear the improvement with this cost effective sampler.

Order Ref: **RR-53CD** £11.99

Other HDCCD recordings include:

TESTEMENT: THE TURTLE CREEK CHORALE.

A stirring programme of American music. (See HFC Issue 117 4/93 for full details).

Order Ref: **RR-49CD** £13.99
RR-49LP £21.50

DICK HYAM PLAYS ELLINGTON.

Not only is this an HDCCD recording, it's also a direct-to-disc, gold CD. (see HFC 117 4/93 for full details).

Order Ref: **RR-50DCD** £35.99

DICK HYAM PLAYS WALLER.

The world's first DCD Direct to CD recording. THE DCD is a limited edition, numbered collectors item, but buy it for the great sounds and fast transients from the Bosendorfer piano. Includes such greats as: Ain't Misbehavin' - Honeysuckle Rose - Handful of Keys - Sweet Savannah Sue and more.

Order Ref: **RR-33DCD** £35.99
RR-33CD £13.99
RR-33LP £21.50

EILEEN FARRELL SINGS ARLEN

Let's Fall in love - I've got the World on a String - Come Rain or Come Shine - Last Night When We Were Young, and many more.

Order Ref: **RR-30CD** £13.99
RR-30LP £21.50

EILEEN FARRELL SINGS ROGERS & HART

I Could Write A Book - I Wish I were in Love Again - Love Me Tonight - Mountain

Greenery - Lover, and many more.

Order Ref: **RR-32CD** £13.99
RR-32LP £21.50

EILEEN FARRELL SINGS ALEC WILDER

It's so Peaceful in the Country - The Lady Sings The Blues - 'S Gonna Be a Cold, Cold Day, and many more.

Order Ref: **RR-36CD** £13.99
RR-36LP £21.50

EILEEN FARRELL SINGS TORCH SONGS

Stormy Weather - When Your Lover Has Gone - The End of a Love Affair - I Get Along Without You Very Well, and many more.

Order Ref: **RR-34CD** £13.99
RR-34LP £21.50



EILEEN FARRELL: THIS TIME IT'S LOVE. ROBERT FARNON & HIS ORCHESTRA.

The More I see You - My Foolish Heart - The Nearness of You - More Than You Know, and more.

Order Ref: **RR-42CD** £13.99

EILEEN FARRELL SINGS JOHNNY MERCER

Too Marvellous for Words - Moon River - Laura - Day In, Day Out - Autumn Leaves, and many more.

Order Ref: **RR-44CD** £13.99

EILEEN FARRELL: IT'S OVER. ROBERT FARNON AND HIS ORCHESTRA

I Get The Blues When It Rains - How About Me? - I'll Remember April - The Shining Sea - Lush Life, and many more.

Order Ref: **RR-46CD** £13.99

REFERENCE JAZZ SAMPLER

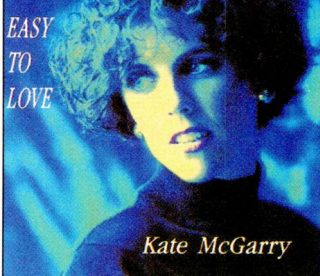
Listen to some great music, great artists and wonderful recordings on this sampler.

Order Ref: **RR-52CD** £11.99

REFERENCE CLASSICS SAMPLER

This sampler is designed to introduce the listener to selected titles from the Reference classics catalogue.

Order Ref: **RR-51CD** £11.99



FONE

RAFFAEL CALACE: MUSICA da CAMERA per strumenti a pizzico

Chamber music for mandolin and guitar with the 'City of Brescia Mandolin Orchestra' and the 'Quintetto a plectro Raffael Calace'. A natural sound recording by Giulio Cesare Ricci. This CD exhibits exceptional dynamic range with a huge spatial effect.

The music is an absolute delight and the recording excellent...buy it and discover what the Italian hi-fi magazines have raved over, you won't be disappointed.

Order Ref: **91-F-02** £12.99

I. VIADANA: VESPERS FOR THE ASSUMPTION OF THE VIRGIN MARY, OPUS No. 27 (Venice 1612).

This is the only recording of these 17th century Psalms, performed by four choirs and AMALTEA, an original instrument ensemble. The CD contains a wonderful ambience, from a full, rich and totally natural recording by Giulio Cesare Ricci. The exquisite sound and the quality of this CD demands attention and places it firmly in the 'must buy' status.

Order Ref: **92-F-08** £12.99

FONE SAMPLER

Fone have a huge catalogue of titles, many of which are unique. This sampler is designed to introduce the listener to FONE's audiophile catalogue. We urge you to hear some of these landmark recordings and enjoy!

Order Ref: **90-F-23** £11.99

SHEFFIELD LABS

PAT COIL: JUST AHEAD

Sheffield's latest CD, produced live-to-two track by Clair Marlo, with special guests: Gerald Albright, John Beasley, Luis Conte, George Doering, Brandon Fields, Jimmy Johnson and more. In this his second outing (see also available CD-31 Pat Coil: Steps at 13.99), pianist Pat Coil brews up another hot collection of original jazz and pop instrumentalists plus a pair of poignant ballads. Pat Coil fans, Jazz lovers and hi-fi enthusiasts will not want to miss this 'cooking' CD!

Order Ref: **CD-34** £21.50

THE SHEFFIELD DRUM & TRACK RECORD

Drummers Jim Keltner and Ron Tutt, each feature in a solo seven minute improvisation which will test the limits of your hi-fi system and perhaps your neighbour's patience.

Designed as an ultra high resolution playback source to enable you to evaluate your audio system's ability to produce bass, transients, crest factor and dynamic range. The CD contains the material from both albums.

Order Ref: **CD14/20** £21.50
LAB-14 The Drum Record £21.50
LAB-20 The Track Record £21.50

KODO: HEARTBEAT DRUMMERS OF JAPAN

The World renowned Kodo percussion troupe has thrilled audiences all over the world. A variety of traditional Japanese percussion instruments are featured in this recording. Please note these tunes span the entire dynamic range from soft playing at the bare limits of audibility to the thunder of the mighty 800 pound o-daiko drum and are extremely challenging to play back correctly.

Order Ref: **CD-KODO** £21.50

VTL - THE VITAL SOUND

KATE Mc GARRY: EASY TO LOVE

My Heart Stood Still - The Night Has A Thousand Eyes - Autumn Nocturne - Just

You Just Me - and more. V.T.L. recordings are lovingly produced by David Manley of Vacuum Tube Logic. Kate chose to sing some of her favourite tunes for this outing, and picked the musical accompanists she most enjoys working with. The musical synergy is very clear on this extremely high standard audiophile recording.

Order Ref: VTL-015 £21.50

VICKIE: VICKIE LEIGH

Take Me To The River - Talk of Love - Welcome Home Blues - When Love Comes In - and more. In this rock/blues CD, Vickie is an amazingly consistent performer with tireless energy. She combines all her vocal abilities with still more great skill - she knows how to make her singing tell us the story behind the song.

Order Ref:VTL-012 £21.50

VTL SAMPLERS

VTL CD's are made for audiophiles in David Manley's customised studio, we urge you to hear these great jazz and blues numbers, recorded without equalisation, with Maley's own Vacuum Tube Logic equipment.

VTL are among the best recorded CDs available and should feature in all dedicated Hi Fi listener's collections.

Order Ref:
VTL-Sam 010 (CD) £18.50
VTL-Sam 020 (CD) £18.50

WILSON

CRUISIN' WITH THE DESOTOS

The perspective and sonic character of Rock and Roll recordings from the late Fifties and early Sixties is quite different from that of the pop recordings of the early Eighties and Nineties.

This recording was made to remind you of the sound you may have heard in an auditorium back around 1962. Tracks include such Rock and Roll greats as 'Good Lovin' - Hang on Sloopy - Whole Lotta Shakin' Goin' On - Runaway, and more.

Order Ref:
WCD-9026 £18.50
W-9026 (LP) £21.50



CENTRE STAGE: THE NATIONAL SYMPHONIC WINDS, LOWELL GRAHAM CONDUCTING

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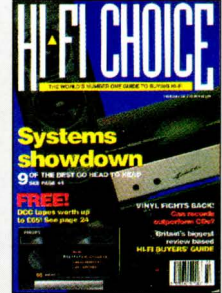
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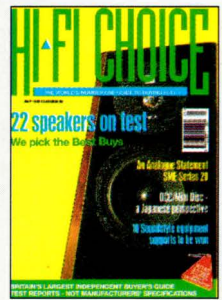
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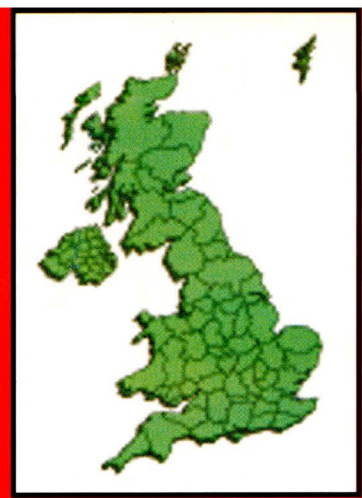
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LINCOLNSHIRE

BOSTON HI FI CENTRE, 65a Wide Bargate, John Adams Way, Boston, Lincs PE21 6SG. (0205) 365477. Quad, Nakamichi, Arcam, Marantz, NAD, Castle, JPW, Rogers, etc. Separate demo studio. Home trial. Free installation. Access, Visa. Tues-Sat 9-5 pm.

STAMFORD HI-FI CENTRE, 9 Red Lion Square, Stamford, Lincs PE9 2AJ. (0780) 62128. Pioneer, Technics, Cyrus-Mission, Rotel, NAD, Yamaha, Kenwood, Marantz, Quad, plus all major speaker manufacturers. Expert advice, comparator demonstrations, on two floors, part exchange Hi-Fi purchased for cash. No appointments necessary, home trial facilities, free installation, service department. Mastercard, Visa & credit charge, finance available. Mon-Sat 9-5.30pm, closed Thursdays.
SUPERFI, 271A High Str, Lincoln LN2 1JG. (0522) 520265. See main entry under Nottinghamshire for full details.

LONDON

ANALOG AUDIO, 849 High Road, London N12. (081) 445 3267. Cambridge, Denon, Rotel, Yamaha, Marantz, Wharfedale, Teac, Mordaunt-Short, Cerwin Vega, NAD. Free install. Service dept. Instant credit up to £1000. Visa & Access. 9.30-6 6 days.

AUDIO T, 190 West End Lane, West Hampstead, London NW6 1SQ.

(071) 794 7848, Fax (071) 431 3570. Great hi-fi from Arcam, Audiolab, Cyrus, Denon, Meridian, Mission, Philips, Rotel, Proac, Micromega, Yamaha, and many more. Mon-Sat 10-6pm. 3 yr gntee on Hi-Fi. Free del & instal. 30 day upgrade scheme. Home dems. PX. 2 dem rooms. A/V Dept.
BILLY VEE SOUND SYSTEMS, 248 Lee High Road, London SE13. (081) 318 5755. Arcam, Linn, Naim, Quad, etc. 2 dem rooms. Int. free credit. Access, Visa. Closed Thurs.

CORNFLAKE SHOP, 37 Windmill St (just off Tottenham Court Rd), London W1. (071) 631 0472 (domestic). (071) 323 4554 (multiroom). Fax. (071) 323 4554 Fax. (071) 436 7165. Tues-Sat 10-7 Rega, Roksan, Naim, Monitor Audio, Arcam, Nakamichi, Rotel, Epos etc. 3 dem rooms. (incl. home cinema) Friendly, professional service. Home trial facilities. Appointments preferred. Full delivery and repair service. Multiroom specialists. Access & Visa.

COVENT GARDEN RECORDS, 84 Charing Cross Road, London WC2 (071) 379 7635, Fax (071) 836 1345. London's premier digital audio centre, PhotoCD, DCC, CD, & 16X9 TV'S. Audiolab, B&O, Marantz, Mission, Cyrus, Philips, Pioneer, Rotel, Rogers, Quad, Sony, Technics, single speaker dem rooms, appointments suggested, installation service available. All major credit cards accepted. Mon-Sat 10am-7.30pm.

DOUG BRADY HI-FI, 14-18 Northmouth St. London WC2H 9HB. (071) 379 4010. Wide range of top specialist hi-fi from Britain, America and Japan. 3 dem rooms. Closed Monday.

GRAHAMSHI-FI, Canonbury Yard, 190a New North Rd, London N1 7BS. (071) 226 5500. Winner Sony/HFN Greater London Dealer Award 1986-1989-1990. Linn, Naim, Rega, etc. £400-£3000-£13,000. Open Tues-Sat

HI-FI & COMPONENTS, 84 Battersea Rise, London, SW11 1EH. Tel: 071 2231 110. Denon, Harman Kardou, Tannoy, Kenwood, Rotel, NAD, Wharfedale, Dual, Shure, Ortofon, Celestion, etc. Appts nec. Service Dept. Access, Visa, Diners, Amex, Open 10-6 Closed Wed.

MUSICAL IMAGES LTD. See under Middlesex & full page advert in the Product Directory.

SOUND ORGANISATION LONDON, 4 Pickfords Wharf, Clink Street, London, SE1 9DG. Tel 071 403 2255. Audio Research, Aura, Creek, Epos, Exposure, Heybrook, Koetsu, LFD, Lyra, Martin Logan, Micromega, Naim, Nakamichi, Rega, Rotel, Roksan, Royd, SME, SonusFaber. Interesting new equipment always under evaluation. Xsingle speaker listening rooms. Appts preferred. Free installation. Service Department. Open Tues-Sat. 10-6. Late dem by appointment.

SOUND SENSE, 350 Edgware Road, London W2 1DX. (071) 402 2100. Alphason, B&W, Kenwood, Nakamichi, Celestion, Denon, Monitor Audio, Marantz, NVA, Sony ES, Yamaha. Appts preferred. Installations available. Access, Visa, Standard credit

facilities. Mon-Sat 9.30-6.30.
STUDIO 99, 79-81 Fairfax Road, Swiss Cottage, London NW6. (071) 624 8855. Naim, Rega, Quad, Meridian, Mission/Cyrus, ATC, Nakamichi, KEF, Yamaha, Arcam, Epos, Acoustic Energy, Bang & Olufsen, etc. 2 single speaker dem rooms. Service dept. Visa/c, Access/c & finance terms. 10-7 Mon-Fri, 10-6 Sat.

SUPERFI, 2-4 Camden High Street, Camden, NW1 0JH (071) 388 1300. See main entry under Notts for full details.

UXBRIDGE AUDIO - CHISWICK, 109 Chiswick High Road, Chiswick, W4 2ED (081) 742 3444 Fax (081) 742 3295. 2 Demo Rooms, Installations, 2 Year Guarantee, 7 day exchange. Major credit cards, Tues - Sat 10 - 6. See Middx entry for brands stocked.

VOLUME ONE, 41 Upper Wickham Lane, Welling. (081) 304 4622. For full details see entry under Kent.

ZEBRA, 18-24 Brighton Road, South Croydon CR2 6AA. 081 688 2093. Audio lab, Arcam, KEF Reference, Marantz, Mission, Micromega, Pioneer, Rotel, Sony, Tannoy, and large range of AV equipment. S2 Air Conditioned Demo Rooms. In a more casual environment. Service department. Mon-Sat 9.30-6.00. Access, Visa & instant credit up to £1000 subject to status.

GREATER MANCHESTER

CENTRAL RADIO, 30-32 Shudehill, Manchester M4 1EY. Tel 061 834 6700. JBL, Mission, B&W, Wharfedale, Aiwa, Teac, Boston, Sony, Thorens, Pioneer. Service Dept. Free installation. Access, Visa, Switch. Interest Free and standard. Credit available. Mon-Sat 9-5.30.

THE AUDIO COUNSEL, 12 Shaw Road, Oldham, Manchester OL1 3LQ. (061) 633 2602. Linn, Yamaha, Rega, Rotel, Arcam, Micromega, EPOS, Creek, Nakamichi, Denon. 2 dem rooms. Free install. Visa, Access, Licenced credit brokers up to £1000 instant credit. 10.00-5.30 Tues, Weds, Sat; 10.00-7 Thurs & Fri. Closed Mon.

MURRAY HI-FI, 19 Middle Hillgate, Stockport. (061) 429 7666. Linn, Naim, Rega, Arcam, Yamaha, Royd, Epos, Creek, Nakamichi, Rotel. Full demo facilities, free installation & delivery, service dept. Full 2yr guarantee on all products. Access, Visa, Lombard Tricity, licenced credit broker. 10-6 Tue-Sat.

SWIFT OF WILMSLOW, 4-8 St Annes Parade, Wilmslow. (0625) 526213. Aura, B&W, Denon, Kenwood, Marantz, NAD, Pioneer, Rotel, Tannoy, Revolver, JPW. Open 9.30am-6.00pm 2 dem rooms. No pressure!

MIDDLESEX

AUDIO T, 159a Chase Side, Enfield, Middx EN2 0PW. (081) 367 3132, Fax (081) 367 1638. Great hi-fi from Arcam, Audiolab, Cyrus, Denon, Meridian, Micromega, Mission, Philips, Rotel, Yamaha and many more. Mon-Fri 10-6pm. Sat 9.30 - 5.30 3 yr gntee on Hi-Fi. Free del & instal. 30 day upgrade scheme. Home dems. PX. 2 dem rooms. A/V Dept.

HARROW AUDIO, 27 Springfield Rd, Harrow. (081) 863 0938. Mon-Sat 9.30-5.30. A&R, Audiolab, Cyrus, Denon, Epos, Monitor Audio, Musical Fidelity, Nakamichi, Quad, Rotel, Tannoy, Thorens, Yamaha, etc.

MUSICAL IMAGES LTD. 173 Station Rd, Edgware (081) 952 5535, fax (081) 951 5864 and 45 High St, Hounslow. Tel (081) 569 5802, fax (081) 569 6353. Most brands available - see full page advert in Product Directory. Interest free credit available, ask for details. Demo Room, Repairs & Service, Mail Order facilities.

RIVERSIDE HI-FI LTD, 422 Richmond Road, East Twickenham, Middlesex TW1 2EB. Tel. (081) 892 7613. Fax (081) 892 7749. A.R., Arcam, Audio Innovations, Castle, Dual, Denon, KEF, Luxman, Michell, Musical Fidelity, Micromega, Marantz, Nakamichi, Rotel, Spenhdor, Systemdek, Tannoy, Yamaha. One demo room, in-car demo for car hi-fi systems. Appts not always necessary. Home trial facilities. Free installation, service dept. Lombard Tricity, Access, Visa, Amex, Diners Club. Mon-Sat 9.30-6. Thurs, Fri 9.30-7.

SIGHT N SOUND, The Treaty Centre, Hounslow, Middlesex TW3 1ES. 081 572 5418, fax 081 572 5417. Sony, Kenwood, Finlux, Toshiba, Philips, Sanyo, Grundig, Pioneer, Technics, Akai. No appts nec, free intall, service dept. Access & Visa, financing available. 9-6pm Mon-Sat.

MERSEYSIDE

W.A. BRADY & SON, 401 Smithdown Rd, Liverpool L15 3JJ. (051) 733 6859. 'Largest choice of specialist Hi-Fi in N.W. £100-£20K'. All credit cards. 3 dem rooms. Closed Monday. **BAVA**

P & A AUDIO (BIRKDALE) LTD 31 Liverpool Road, Birkdale, Southport (0704) 68373. Arcam, Cambridge, Creek, Denon, Michell, Mission/Cyrus, Mordaunt-Short, NAD, Pink Triangle, QED, Revolver, Rogers, Rotel, Royd, Tannoy. 3 Single speaker demo rooms and Nicam surround sound dem room. Free delivery, installation (Merseyside) Service dept, Mon-Sat 9-5.30 Half day Tues, Access, Visa, Lombard.

PETERS HI-FI 11 Werburgh Sq, Grange Precinct, Berkenhead. (051) 647 5626. 9-5.30 closed Thurs. See Cheshire entry for full details.

PETERS HI-FI, 8 High Street, Bromborough, Wirral. (051) 334 1874/2825. Open 9-5.30 6 days a week. See Cheshire entry for details.

WEST MIDLANDS

AMADAUS SOUND & VISION, 10 Boldmere Road, Sutton Coldfield, West Midlands Tel (021) 354 2311. Arcam, Audio Innovations, B&O, Carver, Castle, QED, Wharfedale, Yamaha, Cambridge Audio, Haefler. Single Speaker demo, appts preferred, service available, installations, B&O link install, home trials. Access, Visa, interest free credit available subject to status. 9.30-6pm 6 days.

FRANK HARVEY HI-FI EXCELLENCE, 163 Medieval Spon Street, Coventry. (0203) 525200. All major agencies. Free inst. Service dept. Part ex. 3 dem rooms. Mon-Sat 9.30-5.30. Wed til 8pm. **BAVA**

GRIFFIN AUDIO LTD, 94 Bristol Street, Birmingham. (021) 692 1359/(021) 622 2230. Arcam, Castle, Cyrus, Denon, Linn, Marantz, Naim, Quad, Rega, Rotel. Tues-Sat 10-6. **BAVA**

MUSICAL APPROACH, 37 High Street, Aldridge, Walsall, W. Mids. (0922) 57926. Linn products, Arcam, Creek, NVA, Revolver, Onix, Epos, Marantz, Rotel, Quad & more. Dem facs. Home trial. Service dept. Credit facs available. Access, Visa. 9.30-5.30 Mon-Sat. 9.30-1 on Thurs.

MUSIC MATTERS, 351 Hagley Road, Edgbaston, Birmingham B17 8DL. (021) 429 2811. Roksan, Nakamichi, Arcam, Audiolab, Musical Fidelity, Mission/Cyrus, Meridian, KEF, Monitor Audio, Pink Triangle. 2 single speaker luxury demo rooms. Appts nec, home trial facilities, free installation, service dept. Access, Visa, instant credit up to £1000, interest free credit available. Tue-Thur 10.30-6, Fri 10.30-8, Sat 10-5.30.

NAAM HI-FI VISION, 122-123 New Street, Birmingham. (021) 633 4944. Pioneer, Akai, Aiwa, Panasonic, Yamaha, Toshiba, Hitachi, Bose, Wharfedale, Sony. Demo facilities available, appointments preferred. Access, Visa, 10 month interest free credit. Amex, Lombard Tricity Creditcharge. Mon-Sat 9-6.00.

NORFOLK

AUDIO IMAGES, 7 All Saints Rd, South Lowestoft, Suffolk NR33 0DL. Tel: 0502 582853. For full details see our main entry under Suffolk.

BASICALLY SOUND, The Old School, School Rd, Bracon Ash, Norwich NR14 8HE. (0508) 70829. Arcam, Linn, Naim, Denon, Spondor, Exposure, Audio Technica, Creek, Rega, Epos, etc. 2 comprehensive dem rooms. Home trial. Free installation. Visa, Access, HP facilities. Tues-Sat 9.30-1, 2-5.30.

MARTINS HI-FI, 5 High Street, Kings Lynn. (0553) 761683. Est. 1968. Making good vibrations for 20 years **BAVA**

MARTINS HI-FI, 85/91 Ber Street, Norwich. (0603) 627010. Est. 1968. Making good vibrations for 20 years **BAVA**

NORTHAMPTONSHIRE

AUDIO CRAFT 23-25 Deragate, Northampton, NN1 1TY. Tel: 0604 36291 Bang & Olufsen, Kenwood, Technics, Marantz, Celestion, Mordaunt-Short. No appts nec, Free Install, Service Dept. Open

Mon-Sat 9-5:30pm

CLASSIC HI-FI + VIDEO, School Lane, Kettering, Northants. (0536) 515766. Rotel, Musical Fidelity, Wharfedale, Yamaha, JBL, Cyrus, Nad, Pioneer, Marantz, Kenwood, Kef, Celestion, and many more. Home trial, free instal., service dept. Access, Visa, credit facs. 9.30-5.30pm.

LISTEN INN, 32 Gold Street, Northampton. (0604) 37871 (Fax) (0604) 601430. Linn, Naim, Epos, Royd, Mission, Cyrus, Arcam, Audiolab, Neat, Creek, Quad, Denon etc. 2 Dem Rooms **BAVA**

NOTTINGHAMSHIRE

CHANTRY AUDIO, Chantry Walk, 18-18a Eldon Street, Tuxford, Nr Newark, Notts NG22 0LH. (0777) 870372. Pink Triangle, DPA, Rotel/Michi, Micromega, NVA, Alchemist, Michell, Monitor Audio, Lumley, SME and much more! 3 dem rooms. Home trial, free installation, service dept. Access, Visa & credit facilities and mail order. Mon-Sat 9:30-6pm Sun & evenings home dem by appt.

DEFINITIVE AUDIO, (0602) 813562. For a carefully considered approach to building a true hi-fidelity audio system with components derived from the following manufacturers; Audio Innovations, Snell, Wadia, Micromega, Deltac, Voyd, Systemdek, SME, Revox, Ortofon, Pioneer. Demos by appt. Please phone for further details. Installation free of charge. Mon-Sat 10-7pm, Closed Wed a.m.

NOTTINGHAM HI-FI CENTRE, 120-122 Alfreton Road, Nottingham. (0602) 786919. Over 25 years experience, superb demo rooms, extensive range, free parking. Mon-Sat 9-5.30. **BAVA**

PETER ELLIS AUDIO, 29 Kirkgate Newark, Nottingham, NG24 1AD (0636 704571) Quad, Castle, Arcam, QED, Sugden, Tannoy, Thorens, Marantz, Denon, Teac. Demo Room, Free Install, Service Department. Access, Visa, Mon-Sat 9-5:30 Close at 1:00pm on Thursday.

SUPERFI, 15 Market Str, Nottingham NG1 6HY. (0602) 412137. Kenwood, Technics, Denon, Aiwa, Rotel, Wharfedale, Mission, Marantz, NAD-Celestion, and many more. 2 single speaker dem rooms. Free install on systems, service dept. Access & Visa, Amex. Open 9-5.30, 6 days.

OXFORDSHIRE

ASTLEY AUDIO LTD, 3 Marketplace, Wallingford. (0491) 839305. Aura, B&W, Technics, Panasonic, Pioneer, Kenwood, Sony, Yamaha, Denon, Dual, Mission, Tannoy. Home trial, free installation. Service dept. Access, Visa, Amex, Diners. Instant credit. Tue-Fri 9-5.30, Sat 9-5. Records & CDs stocked.

AUDIO T, 19 Old High St, Headington, Oxford OX3 9HS. (0865) 65961, Fax (0865) 60415. Great hi-fi from Arcam, Audiolab, Cyrus, Denon, KEF, Meridian, Mission, Rotel, Sony, Yamaha and many more. Open Mon Fri 10-6pm, Sat 9.30-5.30. 3 yr gntee on Hi-Fi. Free del & instal. 30 day upgrade scheme. Home dems. PX. 2 dem rooms. A/V Dept. **BAVA**

OXFORD AUDIO CONSULTANTS LTD, Cantay Hse, Park End Street, Oxford OX1 1JE. (0865) 790879 fax (0865) 791665. NAD, Rotel, Musical Fidelity, Pioneer, Marantz, Rogers, TDL, Thorens, Audio Research, Proceed 2 Demo rooms. Service Dept, Home trial and free installation. Instant credit, Access, Amex, Visa. 10-6 Mon-Sat.

WESTWOOD AND MASON, 46 George Street, Oxford. Tel: 0865 247783 Arcam, Rotel, Rega, Epos, Tanoy, Royd, JPW, Mission, Nakamichi, Denon, Aiwa, Naim, Quad, Aura, Teac. Open 9:30-5:00pm. Dem room. Closed Thursdays. **BAVA**

SHROPSHIRE

AVON HI-FI, 12 Barker Street, Shrewsbury, Shropshire SY1 1QJ. (0743) 55166. NAD, Quad, B&W, Arcam, Kenwood, Aiwa, Bose, Nakamichi, Revolver, Onkyo. Dem room. Home trial. Free install. Service dept. Access, Visa. £1000 instant credit. Mon, Tues, Wed, Fri, Sat 9-5.30.

CREATIVE AUDIO, 9 Dogpole, Shrewsbury. (0743) 241924. Arcam, Audiolab, Celestion, Cyrus, Denon, Epos, Kef, Meridian, Mission, Naim, Quad, Rega, Roksan, Rotel, Ruark, Tripod. Dem room. Home trial and free installation. Credit to £1000. Access, Visa. Tues-Sat 9.30-5.30. Service dept. MID-SHROPSHIRE AUDIO, 4 Holland Court, Dawley, Telford TF4 2EX. (0952) 630172. Audio Innovations, Marantz (inc Music Link), Denon, Tannoy, Ortofon, Pink Triangle, Ion Systems, Systemdek, Ruark, Monitor Audio etc. 2 dem rooms. Home trial, service dept. Instant credit up to £1000 Access, Visa, Amex.

SOMERSET

MIKE MANNING AUDIO, 110 Middle Street, Yeovil, Somerset BA20 1NE. (0935) 79361, Fax (0935) 32923, Mobile (0850) 325965. Naim, Roksan, Pink Triangle, A+R (Arcam), ION, NAD, Pioneer, Rotel, Denon, etc. Dedicated listening lounge, for relaxed and unpressured demonstrations. Appts not usually nec. but best to phone first. Home trial facilities on request, free installation, service department. Instant credit, Access & Visa, etc. 9-5.30 closed Mondays.

STAFFORDSHIRE

GRANGE HI-FI LTD, 153 Branston Rd, Burton-on-Trent, Staffordshire DE14 3DQ. (0283) 33655. Albarry, Audio Innovations, Arcam, Castle, Denon, Pink Triangle, Marantz, Rotel, Rogers, Systemdek, SME, Tannoy, TDL. Dem fac, appts nec on Sat, Free Install. Service dept Access, Visa. 9.00-5.30pm. Closed Mon & Wed afts. Closed for lunch 12.00-12.30.

SUFFOLK

AUDIO IMAGES, 7 All Saints Road, Pakefield, South Lowestoft, Suffolk NR33 6JL. Tel/Fax: 0502 582853. Quad, Triangle, Arcam, Castle, Rotel, Moth, JPW, Finlux, Audio Innovations, plus the amazing Rothwell range. Separate demonstration room, no appts necessary. 10-6.30 Tue-Thur, 7pm Fri, 6pm Sat.

BURY AUDIO, 47 Churchgate Street, Bury St Edmonds, Suffolk, IP 33 1RG. Tel 0284 724337. Arcam, Furukawa, Heybrook, Infinity, Marantz, Meridian, Michell, Pink Triangle, Proac, Rotel, Target, Roksan, Shannian, Quad Etc. Single Speaker Room. No appointments necessary. Home trial facilities. Free Installation. Service Department. Access, Visa, Switch. Open 6 days a week, Mon/Tues/Sat 9.30-5.30 Thurs/Fri 9.30-7.00. Closed Wed

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

SURREY

AUDIO SOUTH, 24 (The Woolmead) East Str, Farnham, Surrey GU9 7TT. (0252) 714555. Audio Note, Deltac, JPW, Marantz, Rotel, Teac, etc. AV specialist. Dem room and evening appointments available. Home trial facilities. Free installation. Access, Visa. 10.30-6 Mon-Sat.

COSMIC, 244/256 Station Road, Addlestone, Surrey, KT15 2PS. (0932) 854522/851753/843769. Fax (0932) 841615. Most brands stocked, including Aiwa/Arcam, Denon, Mission Cyrus, NAD, Nakamichi, Pioneer, Quad, Rotel, Yamaha, etc. Open 7 days 9-6pm. Part exchange, large free car park, service dept, instant credit available, Access, Visa, Switch.

DATASOUND, 23 South Street, Dorking, Surrey RH4 2JZ. (0306) 882897. Arcam, Celestion, Denon, Dual, Marantz, Mission, Musical Fidelity, NAD, Rotel, Tannoy. Dedicated listening room. Free install. Service dept. Up to £1000 instant credit subject to status. 9-5.30 6 days.

INFIDELITY, 9 High Str, Hampton Wick, Kingston Upon Thames, Surrey. Tel: (081) 943 3530. Arcam, Creek, Epos, Heybrook, Micromega, Naim Audio,

Roksan, Rega Research, Shannian, TEAC. Single speaker listening room. Appts preferred, free installation, service dept. Major credit cards. Closed Mon, Tue-Fri 10.30-7, Sat 10-6.

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

RIVERSIDE HI-FI, 422 Richmond Road, East Twickenham, TW1 2EB. Tel: (081) 892 7613. Fax: (081) 892 7749. See main entry under Middlesex.

ROGERS HI-FI, 13 Bridge Street, Guildford, Surrey. (0483) 61049. Aiwa, Creek, Denon, Dual, JPW, Marantz, Philips, Pioneer, Systemdek, Tannoy. Demonstration facilities available, no appointment necessary. Free installation. Service department. Access/Visa. Instant credit up to £,000 subject to status. Monday-Saturday 9.30-6pm, later by appointment.

SOUNDS EXCLUSIVE, 1 Kent House, High Str, Cranleigh GU6 8AU. (0483) 268185. Michell (amplification & decks), Marantz, Ariston, Ortofon, AME, Sumo, Proac, Jamo, Origin Live, Kiseki. Demo room, appts preferred, home trial facilities, free install, service dept. Access, Visa. Open 9-5.30 Mon-Sat.

SPALDINGS HI-FI, 352-4 Lower Addiscombe Rd, Croydon, Surrey. (081) 654 1231/2040. 3 dem rooms and home demo. Free installation, credit. Mon-Sat 9-6. Tues to 8. Closed Wed. Service dept. **BAVA**

SURBITON PARK RADIO, 48 Surbiton Rd, Kingston-Upon-Thames, Surrey. (081) 546 5549. Quad, Castle, Dual, Denon, Kenwood, Rotel, Pioneer, QED, B&W, Tannoy. Demo facilities. Access, Visa. 9.30-5.00 Tues-Sat. Service dept.

SURREY HI-FI, 45 High Street, Godstone, Surrey RH9 8LS. (0883) 744755. Parking, easy access - just 2 mins off junction 6, M25. Tube Technologies, Rel Acoustics, Audio Lab, Quad, TDL, Nakamichi, KEF, Thorens, Rotel, Marantz, Denon, Michell, Tannoy, Top Line, Rel Acoustics, Single speaker demo room. Demonstration by appointment, free installation, service dept. Access, Visa, Mastercard. 0% Credit. Open 9-6, closed Wed.

ZEBRA 18-24 Brighton Road, South Croydon CR2 6AA. 081 688 2093. See main entry under London.

SUSSEX (EAST)

DEFINITIVE AUDIO, Brighton. (0273) 208649. Audio Innovations, Impulse, Voyd, Snell, SME, Audionote, Micromega, Goldring, JPW, Pioneer. Demonstration by appointment, home demonstration a pleasure. Free installation, Access, Visa. Mon-Sat 9.30-6.00pm.

JEFFRIES HI-FI, 69 London Road, Brighton, East Sussex. Tel 0273 609431. 2 Dem Rooms, closed Mon. Late night Wed. Free parking. Bus route. Credit Facilities. **BAVA**

JEFFERIES HI-FI, (Poutrmouth), 29 London Road, Portsmouth, PO2 0BH Tel: 0705 663604. 2 Dem Rooms, Closed Mondays. Late night Wednesday. Free parking. Bus route. Credit facilities. **BAVA**

JEFFRIES HI-FI, 4 Albert Parade, Green Street. Eastbourne, East Sussex. Tel: 0323 31336. 2 Dem Rooms. Closed Mon. Late night Wed. Free Parking. Bus Route. Credit Facilities. **BAVA**

THE POWERPLANT, 66 Upper North Street, Brighton BN1 3FL. (0273) 775978. Roksan, Musical Fidelity, Marantz, Rotel, Yamaha, Tannoy, Audiolab, B&W, Micromega, Epos, JPW, etc. Comfortable single speaker facilities. No appts. nec. Home trial facilities, free install. Late night dems by request. Service dept. Credit facilities available on request. Tue-Sat 10-6pm.

SUSSEX (WEST)

AUDIO DESIGNS, 26 High Street, East Grinstead, W. Sussex RH19 3AS. 0342 314569. Linn, Naim, Alphason, Arcam, Rotel, NAD, B&W, Quad, Tannoy,

Thorens, TEAC, etc. Very comfortable listening room. No appts nec., Home trial facilities, free installation, service dept. Access/Visa. 9.30-6:00 Mon-Sat, late Tue till 8pm.

BOWERS & WILKINS LTD, 1 Becket Buildings, Little Hampton Rd, Worthing. (0903) 2 64141. B&W, Nakamichi, Castle, Denon, Dual, JVC, Mordaunt Short, Philips, Quad, Sony, Technics. 3 dem rooms. Mon-Sat 9-5.30, Wed 9-1pm. Home trial facilities, free install. Credit to £1000, Access, Visa. Service dept.*

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

TYNE & WEAR

BILL HUTCHINSON LTD, 87A Clayton Street, Newcastle-Upon Tyne. Tel: (091) 230 3600. A.R. Aiwa, Denon, Dual, JVC, Mission, Mordaunt Short, Omar, Technics, Yamaha, etc. Demo facilities. Free Install, Service Department, Instant Credit, Access, Visa, Mon-Sat, Late Tue till 8pm

RED RADIO SHOP AND HI-FI CENTRE, 11 Olive Street, (Off Park Lane), Sunderland. Tyne & Wear SR1 3PE (091) 567 2087. Castle, Denon, JVC, Kenwood, Mordaunt-Short, Michell, Pioneer, Teac, Tannoy, Monitor Audio etc. AV Dem room, large with comparator facility. No appts nec, Free install. Service dept. Interest free credit and no deposit 9am-5.30pm daily.

WARWICKSHIRE

CASTLE HI-FI, 59 Smith Street, Warwick. CV 34 4HCE. Tel (0926) 499963. A.R. B&W, LPW, Jenson in car, Marantz, usical Fidelity, NAD, Pioneer, Rogers, TDL, Yamaha, Dolby Pro Logic. Dem Room. No appt nec, Home trial facilities, Free Installation, Service Department. Interest free credit, Access, Visa, Chartered Trust. Open 10-6 6days a week.

FRANK HARVEY HI-FI, 163 Spon Street, Coventry, Warwickshire, CV1 3BD. Tel 0203 525200. Arcam, Mission, Cyrus, Musical Fidelity, Marantz, Rotel, NAD, Tannoy, Yamaha, KEF. Open 9:30-5:30 closed Thursdays.

NAAM HI-FI VISION, 78 Lower Precinct, Coventry CV1 1DX. (0203) 632086. NAD, Yamaha, Marantz, Pioneer, Kenwood, AR, Akai, Aiwa, Panasonic, Toshiba, Wharfedale, KEF. Demo facilities. Access, Visa, Amex, Lombard Tricity credit charge. 9.00-6.00 Mon-Sat. Closed Thurs.

STRATFORD HI-FI, 25 Henley Street, Stratford Upon Avon, CV3 9W. Tel (0789) 414533. Please call for further details.

WILTSHIRE

THE AUDIO EXCHANGE, 52 Morse Str, Swindon, Wiltshire, SN1 5QP. Tel: (0793) 539008. Acoustic Energy, Audio Innovations, Beard, Cerwin Vega, Impulse, Magnum, Micromega, Michell, REL, Sequence. AV and single speaker demo room. Home trial facilities, free installation, service dept. 9-7 six days a week.

AUDIO T, 60 Fleet St, Swindon, Wiltshire. SN1 1RA. (0793) 538222, Fax (0793) 487260. Great hi-fi from Arcam, Audioblab, Cyrus, Denon, Linn, Meridian, Mission, Rotel, Sony, Yamaha, and many more. Mon-Sat 9.30-5.30. 3 yr gntee on Hi-Fi. Free del & instal. 30 day upgrade scheme. Home dems. PX. 2 dem rooms. AV Dept.

PR SOUNDS, 58 Castle Street, Trowbridge, BA14 8AU. Tel 0225 777799. Also at Melksham & Devizes. Pioneer, Technics, Kenwood, Denon, Marantz, B&W, Tannoy, JPW, Dual. Where music is a pleasure, personal service, no appointments necessary. Installations & much much more. Access/Visa £1000 instant credit. Open 9-6, 6 days.

WORCESTERSHIRE

NAAM HI-FI VISION, 27 The Cross, Worcester, WR1 3PZ. Tel 0905 726375. Denon, Marantz, NAD, Musical Fidelity, Acoustic Research, Harman Kardon, Sony, Technics, Akai. Appts nec

demonstrations. Installation 7 days a week up till 9 pm. Interest Free credit over £400. Open 9-5:30 Mon-Sat.

WEST MIDLANDS AUDIO, 158 Ombersley Road, Worcester WR3 7HA. (0905) 58046. Nakamichi, Naim, Rega, Absolute Sounds, Meridian, Arcam, Ion Systems, Roksan. 3 dem rooms for budget & high end audio. Appointments necessary. Free installation. Service Dept. Access, Visa, Amex, Diners, Lombard/Hitachi. Mon-Fri 9.30-8.30 by appt Sat 9-5.30.

SPAINS HI-FI, 2&2a New Road, Bromsgrove, Worcestershire. Tel: (0527) 72460. B&W, Denon, Kenwood, Marantz, Mission, Nad, Pioneer, Rotel, Sony, Tannoy and more. Integral demo room/showroom for instant comparisons on hi-fi and AV equipment. Free installation, service dept & credit facilities, Access & Visa.

YORKSHIRE (NORTH)

THE AUDIO CLINIC, 22 Lord Mayors Walk, York, Yorkshire, Y3 7HA. Tel: 0904 646309. Mission, Revox, Yamaha, JVC, Audio Innovations, Celestion, NAD, Musical Fidelity, Allison, Thorens. No appts nec, Home trial facilities, Free Installation. Service Department Access/Visa, Credit. Open 10-5:30 Mon-Sat.

SCARBOROUGH HI-FI CENTRE, 14 Northway, Scarborough, N. Yorks YO11 1JL. (0723) 374547. Aura, Albarry, B&W Matrix, Cyrus, Denon, Pioneer, Marantz, Cabasse, Tannoy, Laser vision and wide screen TV. Dem room, appointment preferred. Home trial facilities. Free installation. Service dept. Access/Visa/Credit charge/£1,000 instant credit/Amex/Diners. 10-6 Mon to Sat.

SOUND ORGANISATION YORK, 2b Gillygate, York YO3 7EQ. Tel: (0904) 627108. Linn, Meridian, Micromega, Naim, Rega, Arcam, Mission, Denon, Epos, Rotel. 3 single speaker dem rooms. Appts preferred. Home trial. Free installation. Service dept. Credit fac on request. Access, Visa. 10am-5:30pm Tues-Sat. Sony Dealer Award nominated '86,' 87,' 88.

VICKERS HI-FI, 24 Gillygate, York. (0904) 629659. Audioblab, Harman-Kardon, Marantz, Musical Fidelity, Pink Triangle, Quad, Systemdek, Tannoy, Technics, & lots more. 3 demonstration studios (2 by appointment) superb showrooms, 2 year guarantee on all hi-fi products. Appts as above, home trial facilities, free installation, service department. Qualified and experienced staff, over 25 years experience. 12 months interest free credit. 10.30-5.30 Mon-Sat.

YORKSHIRE (SOUTH)

BARNLEY HI-FI CENTRE, 40-42 Sheffield Road, Barnsley, S. Yorks. S70 1HP. (0226) 205549 Fax (0742) 467207. Arcam, Quad, Audioblab, Mission Cyrus, Technics, Denon, Tannoy, Nakamichi, Dual, Rotel. Purpose built demo room, no appts necessary, free install, service dept, Access, Visa, varying finance packages. Open 9.30-5.30, 5 days (closed Thurs).

HI-FI STUDIO, Sunnyfields, Doncaster. (0302) 781387. Sugden, ProAc, Impulse, Teac, Ruark, Michell, AMC valve, Art Audio valves, Heybrook, Monitor Audio, Albarry. Listening room demos. Home trial. Free installation. 2 yr guarantee on all equipment. Service available. Access, Visa. 10-8pm 6 days. Phone for further info. & FREE fact pack.

YORKSHIRE (WEST)

AUDIO PROJECTS, 45 Headingley Lane, Leeds. (0532) 304565. A&R, Audioblab, Creek, Heybrook, Linn, Musical Fidelity, Naim, Quad, Rega, etc. Free installation, home trial, 2 year warranty, appts preferred. Tues-Fri 9.30-6, Sat 2.30-5.30. AUDIOVISION (BRIGHOUSE) LTD, 5 Bethel Street, Brighouse, (1 mile from junction 25, M62) W. Yorks. HD6 1JR. Tel 0484 713996. Largest range of Technics Hi-Fi in Yorkshire. Aiwa separates, Castle, Cerwin Vega, Mordaunt Short speakers. Panasonic Nicam TV's, VCR's and camcorders.

Yamaha, Philips widescreen TV's, CD-Interactive Players. Dolby Pro-Logic AV Surround Systems. Reproduction Furniture. Telarc, CD- Audio, CDI and DCC. Demo's. Free expert install. Panaservice in-store service dept. Access, Visa, credit charge. Mon-Sat 9-5:30.

CLEARSTONE (Formerly Erricks), Rawson Square, Bradford, (Near John St Market). (0274) 309266. A&R, Linn, Quad, Exposure, Nakamichi, Mission, Denon, Kenwood. Private demo rooms, no appt nec, home trial facilities, free installation, service dept. Access, Visa, licenced credit broker. Mon-Sat 9-5:30 (Tue 10-5:30).

DOUG BRADY HI-FI, The Forge Cottage, 19 Crossgate, Otley, Leeds, West Yorkshire LS21 1AA. (0943) 467689. Naim, Arcam, Rotel, Pink Triangle, Meridian, Epos, Castle. Two dem rooms, free install, service. Access/Visa. Open 10-6pm Tues-Sat.

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

IMAGE HI-FI, 10 The Springs, Wakefield, WF1 1QE. (0924) 200272. Arcam, Linn, Meridian, Mission, Quad, Rotel, Etc. 2 Listening Rooms. Free Parking. DeLl & Instal Mon-Sat 9:30 5:30 pm

IMAGE HI-FI, 8-10 St Annes Road, Headingley, Leeds, L56 3NK (0532) 789374. Arcam, Linn, Meridian, Mission, Quad, Rotel, Etc. 3 Listening Rooms. Free Dem & Instal. Mon-Sat 9:30 - 6:00pm

NORTHERN IRELAND

BELFAST

LYRIC HI-FI, 163 Stranmills Road, Belfast. (0232) 381 296. Linn, Naim, Rega, Arcam, Denon, Rotel, Musical Fidelity, Revox, Mission etc. Mon-Sat 10-6, Late night Thurs.

ZEUS AUDIO, 6 Hope Street, Belfast, (0232) 332522. Audio Innovations, Pink Triangle, Roksan, Marantz, Celestion, Linn, Meridian, Mission Cyrus, Ortofon, etc. Mon-Sat 10.00-5.30. Late night Thursday.

COUNTY DOWN

ASTON AUDIO, Unit 8, Kings Road Shopping Centre, Kings Road, Belfast. Tel: 0232 402220. Akai, Technics, JVC, Mitsubishi, Samsung, Toshiba, Panasonic, and many more. Demos available, Open Mon-Fri 10-8pm Sat 10-5pm

IRELAND

DUBLIN

LAFAYETTE HI-FI, 50 Wellington Quay, Dublin, Tel: 353177 0443. Technics, Denon, Marantz, Sony, Pioneer, Aiwa, Cyrus, Mission, Cerwin Vega. No appts nec, Free Install. Unique trade in service. Credit Cards welcome. Open 10-6 6 days a week.

SCOTLAND

AYRSHIRE

LASER AUDIO 9 West George Street, Kilmarnick, Ayrshire, KA11DH. Tel 0563 40292. Audioblab, Aiwa, Celestion, Cyrus, Denon, Dual, Mission, Philips, Pioneer, Rotel, Ruark, Systemdek and Tannoy. Dem Room, A/V on Dem. Appts Preferred, home trial facilities, Free installation, service facilities. Access, Visa and written credit. Open Tues-Fri 10-5.30 Sat 9.30-5.30.

EDINBURGH

BILL HUTCHINSON LTD, 43 Clarke St, Edinburgh. (031) 667 2877. AR, Aiwa, Denon, Dual, JVC, Mission, Mordaunt-Short, Omar, Technics, Yamaha etc. Dem facilities. Mon-Sat 10-6. Free installation,

instant credit. Access, Visa. Service dept.

GLASGOW

BILL HUTCHINSON LTD, 43 Hope Street, Glasgow. (041) 248 2857. A.R. Aiwa, Denon, Dual, JVC, Mission, Mordaunt-Short, Omar, Technics, Yamaha etc. Dem facilities. Mon-Sat 10-6. Free installation, instant credit, Access, Visa. STEREO STEREO, 278 St. Vincent St, Glasgow G2 5RL. (041) 248 4079. Linn, Naim, Rega, Arcam, Creek, Epos, Castle, Shahinian, Denon and Sehring etc. Closed Tuesdays Mon-Sat 10-6.

GRAMPIAN

HI-FI EXCELLENCE 293 Union Grove, Aberdeen, AB1 6TD. Tel 0224 322520. Aiwa, Audio Innovations, Denon, Impulse, Infinity, Musical Fidelity, Rotel, Roksan, TDL. 2 large single speaker dem rooms. Appts necessary after 6.00pm. Home trial facilities, Free installation, Service Department. Various offers, 3 Yr guarantee. Open 10-6.00pm 6 days. HOLBURN HI FI Ltd, 441 Holburn St, Aberdeen (0224) 585713. Arcam, Audioblab, B&W, Celestion, Denon, Dual, Epos, Heybrook, ION, Kenwood, Linn, Creek, Marantz, Meridian, Mission Cyrus, M.S., NAD, Nakamichi, Pioneer, QED, Quad, Revox, Rogers, Rotel, Ruark, Tannoy, Technics, Wharfedale, Yamaha. 9.30-5.30 Mon-Sat.

TAYSIDE

J.D. BROWN, 28-36 Castle St, Dundee DD1 9NZ. (0382) 26591. Rotel, Denon, Pioneer, Technics, Aiwa, Mission, Castle, Mordaunt-Short, Monitor Audio, Bose, Infinity. All equipment ready for demonstration. No appt nec, free installation, service dept. Open 9.30-6pm six days a week, (close 5pm Sat).

WALES

CLWYD

ELECTRO TRADER, 19 Colwyn Crescent, Rhos On Sea, Colwyn Bay, Clwyd. North Wales LL28 4RN. (0492) 548932. Rotel, Yamaha, Harman Kardon, Teac, Alphason, Heco, Infinity, JBL, Musical Fidelity, Tannoy, Rotel, Michi etc. Dem room. Appts preferred. Home trial. Free installation. Access, Visa. Open 9.30-1.00, 2.00-5.30 Mon-Sat.

ACTON GATE AUDIO, 4 Ruabon Rd, Wrexham, North Wales, Tel: 0978 364 500, Arcam, B&W, Marantz, Mission, NAD, Quad, Rega, Rotel, Tannoy, Yamaha, etc. Dem Facilities, A.V. on dem, Mail Order. No appts nec, home trial fac, Free install, Service Dept. Access, Visa. 9.30-5:30 closed Weds PM

SOUTH GLAMORGAN

AUDIO EXCELLENCE, 134 Crwys Road, Cardiff. (0222) 228565. Great Hi Fi carefully selected and demonstrated by friendly, enthusiastic staff. Closed Mon.

WEST GLAMORGAN

AUDIO EXCELLENCE, 9 High St, Swansea. (0792) 474608. Great Hi-Fi carefully selected and demonstrated by friendly, enthusiastic staff. Closed Mon.

GWYNEDD

I&H GRIFFITHS & SONS, 313 High St, Bangor LL57 1YA. (0248) 370655. Yamaha, Tannoy, Teac, Goodmans, Wharfedale. Demos available, no appts nec, home trial facilities, free installation, service dept. Access, Visa, Lombard credit charge. Mon-Sat 9-5.30, Wed 9-1. Audio Visual Specialists. PETERS HI-FI Victoria Buildings, Mostyn Avenue, Craigh-y-don, Llandudno. (0492) 876788. 1 Single speaker dem room. Open 9-5.30. Closed Wed. See Cheshire branch for details.

The Directory



This is the legendary Hi-Fi Choice Directory, the only audio buying guide that is entirely based on comprehensive technical and subjective reviews. Each and every entry carries the weight of our exhaustive test procedures with regularly updated prices and specifications.

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

Each product along with its current retail price is placed in its respective category in alphabetical order. The prices of the products are updated on a regular basis, although it should be noted that our value ratings are based on the product's price at the time of review.

▲ Recommendations and Best Buys

Perhaps the most influential symbols in the *Directory* are the little red triangles ▲ found in the value column at the beginning of each entry where appropriate.

Products that make the grade are awarded the Best Buy or Recommended accolade.

▲ A product carrying the Best Buy swagtag is of excellent quality and good value for money in its price category.

▲▲ Recommended products are runners up, but still definitely worth considering within their price bands.

Please note however, that an expensive Recommended product will nearly always sound better than an inexpensive Best Buy. An ideal situation would be to choose suitably priced ▲▲ Best Buy or ▲ Recommended products from relevant categories and create a Best Buy system. But, due to the variety in tonal balance that exists in much audio equipment,

system building is unfortunately not that simple.

These ratings make a useful guideline for shortlisting components, but only experiencing the actual combination will tell you whether it works for you.

Which of course is where a competent dealer is crucial. A good dealer, such as you might find in our *Dealer Directory*, will be skilled in art of putting components together so that their sonic sum is greater than the individual components in the system.

Sound quality

This column contains the ratings for the standard achieved in our listening tests. The sound quality ratings range from Poor to Excellent. Their meaning and order as follows;

P	Poor
A-	Average-
A	Average
A+	Average+
G-	Good-
G	Good
G+	Good+
VG	Very Good
E	Excellent

Finding that component

Before you shop, follow our top eight tips for better buying:

1. Check out the components' recommended retail prices in the *Directory*.
2. Find out as much as you can about the products you want by reading *Hi-Fi Choice's* reviews and lab tests.
3. Visit local dealers that stock some of the brands you want to hear and try to find one that seems sympathetic to your needs.
4. Don't discount a dealer's suggestions just because the products don't have rave reviews.
5. Take your own software (records, CDs, tapes) along for a demonstration of the equipment that the dealer recommends.
6. Listen at the sort of volume you would normally use at home — systems often sound more impressive when played loud.
7. If you are unsure about something or want to hear an alternative, just ask.
8. Audition a system for a reasonable amount of time, say three quarters of an hour or so before making a decision.

With P being the worst and E the best rating within a section.

One important point to remember is that these cannot be used to compare products from different categories. For example, a cassette deck rated Excellent in sound quality will not usually offer the same standard of fidelity as a similarly rated turntable or CD player. Unless you have first generation masters of course.

Comments

The Comments column contains a potted summary based on the original review, emphasising the salient points of a product's character and sonic performance. The space available doesn't allow for great detail but we have attempted to put across the essence of the review. Obviously, important information on compatibility or auxiliary equipment used in the test cannot be included, and we would advise you to refer to the original review for this.

Please note that these comments are those of our own re-

viewers and not, as is the case with some magazines, those of the manufacturer.

Features

Product features are shown with a combination of figures and blob charts, with headings at the top of each column indicating the appropriate category, a blob indicating the existence of a particular feature on the product.

There are different headings for each section of course and the more complicated categories are explained in the individual introductions. Where figures are used the unit of measurement is shown in the heading.

Back issues

The final column contains a reference to the issue of *Hi-Fi Choice* which featured the complete review. If you wish to get a better idea of a product by reading the complete review it is possible to order a copy through our back issues department.

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Amplifiers

The Directory entry for the AMC CVT3030 integrated amplifier, a 35 watt model with MM phono and five line inputs and average sound.

Product	EPrice	Comments	Output W/R/L	Line inputs	MM/IC	Integrated	Power amp	Remote control	Headphone socket	Issue No.
AMC CVT3030	460	A well meaning and affordable attempt to mix transistors with valves, albeit one that only really shines with simple musical styles.	35	5	•	•	•	•	•	116



Amplifiers

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

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

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

We include our measured power output (RMS, 8ohm load, 1 channel driven) – but again, paradoxically, this doesn't necessarily correspond to the loudness capability of the amplifier, which has as much to do with the elegance of the over-load characteristics within a given system (valve

amplifiers invariably sound more powerful than their rating would suggest).

Apart from output the facilities listing shows how many line (that is inputs besides those for phono cartridges) inputs a product has and includes tape inputs. The MM and MC blobs indicate which types of cartridge can be accommodated. Integrated, preamp and power amp indicate the type of amplifier reviewed, and in some instances that a pre/power combination has been tested. In such instances the price given is for both components. The remote control and headphone socket blobs indicate the existence of these facilities.

Amplifiers

Product	Price	Comments	Output W/RCL	Line inputs	MM	MC	Integrated	Preamp	Power amp	Headphone socket	Remote control	Issue No.
AMC CVT3030	460	A A well meaning and affordable attempt to mix transistors with valves, albeit one that only really shines with simple musical styles.	35	5	•	•						116
Aiwa XA-006	150	A Competent enough performer with plenty of facilities. A gutsy sound though one that's rougher via CD than MM.	67	5	•	•						92
▲ Akai AM-47	230	G+ Plenty of widgets and an unexpectedly sharp, open and detailed sound. Looks ghastly but sounds strain free.	104	4	•	•						104
Akai AM-95	630	A- A revamped version of the older AM-93 with newer onboard bitstream DACs. Its sound is just too eager, however	110	6	•	•						109
Albarray AP4/S508	850	A- A disappointing sound from a pre/power amp that's hamstrung by a variety of technical oversights. Albarray has done better.	46	4	•	•			•	•		116
▲ Albarray PP1	400	G+ Available with or without various MM/MC options, the 'basic' PP1 has an attractively warm, earthy sound.	48	4					•			104
Alchemist Kraken	444	A Class-A objet d'art that's far too sensitive to RF interference. Can sound cold and fierce as a result.	54	5	•	•						116
Arcam Alpha 3	200	A Generally lacklustre and bland sound offered on this occasion met with (unexpected) disapproval.	53	3	•	•						104
▲ Arcam Delta 110/120	1300	G Performance is limited by power amp - in isolation the PDM-preamp offers a remarkably open and detailed sound	112	4	•	•			•	•		92
▲ Arcam Delta 290	450	VG Combines the dryness and restraint of Arcam's older models with a refreshing sense of detail, dynamics and musical colour.	99	5	•	•			•	•		116
▲ Arcam Delta 60	300	G+ Very refined and highly detailed sound via MM and CD without any of the hardness ted via the MC stage	59	4	•	•			•			68
▲ Art Audio Quintet	950	VG Switchable triode/ultralinear output stage. In triode mode these are 15 of the sweetest watts around. Surprisingly gutsy	15/25							•		109
Audio Innovations Series 200	850	G Turns in a fuller and more substantial performance via MM rather than CD. Otherwise its sound can seem slightly bleached.	10	5	•	•			•	•		109
▲ Audio Innovations Series 300II	500	G+ Under-powered and over-distorted yet capable of realising an open and captivatingly expressive sound. Sensitive speakers are a must	9	4	•	•						97
▲ Audio Innovations Series 700	999	G+ Valve amp that can turn the roughest of digital sounds into music, both understated and graceful. Sensitive speakers are a must	24	5	•	•						116
▲ Audio Note Ongaku	43125	E A single ended, zero negative feedback, triode, line level integrated amp and a half. Probably the best amplifier in the world!	27	6					•			Col
▲ Audiogram MB1	500	G+ It'll successfully tackle the most difficult of speakers and still provide a very warm, rich and euphonic sound.	46		•	•				•	•	116
▲ Audiolab 8000A	430	VG Recent mods have cured the slightly glassy treble, replacing it with a smoother and more solid style of music making	81	7	•	•			•			97
Audiolab 8000C/8000P	970	G Very distinctive, almost stark neutrality that will not appeal to all listeners. Good value engineering, nevertheless	157	7	•	•			•	•		97
▲ Aura VA-100 Evolution	300	G Might overheat when driving insensitive, low-impedance speakers but was applauded for its sense of scale and drama via CD	81	5	•	•			•			109
▲ Aura VA-50	220	VG Superficially similar to the cheaper VA-40 but with much more of the old MA-80's magic! Great sound from a slimline package	65	5	•	•			•			97
▲ Beard Audio CA35/P35mkII	1790	VG Good build quality and finish and a characteristic valve sound make a first class amplifier capable of great musical enjoyment	35	4	•	•			•	•		63
Beard CA506	1295	G+ A versatile valve preamp, the bass sounded lively if a touch softened, while the treble was detailed but lacked a little sparkle	4	•	•				•			50
Beard M70	1995	G+ A substantial British monoblok power amplifier, but not a great deal more impressive than the P35	70							•		50
▲ Concordant Excelsior	1040	E Styling might not inspire confidence, but sonically this preamp is tremendously vivid and detailed. Real high-end performance	3	•					•			77
▲ Conrad-Johnson PV-10	1250	E Fabulous preamplifier. Beautiful imaging, superb detail, plenty of gain on the phono stage; classy build quality too.	4	•					•			78
▲ Conrad-Johnson Premier 7	11000	E The 'Seven is designed without compromise, and is clearly one of the finest (valve) preamplifiers money can buy.	4	•	•				•			Col
▲ Creek CAS 4040 S3	220	G Now in mk3 guise the '4040 offers a dry but tidy sound via disc and one that's slightly leaner and better focussed on CD.	41	3	•	•						92
Creek CAS 4140 S2	250	A+ Running production changes inspired us to re-review this amp which now sounds thicker and 'blurred' compared to the original	41	3	•	•						109
Creek CAS 6060	500	G Looks like the old '5050 but employs the sort of big, meaty-sounding electronics used in the earlier '4040. Dynamic and impressive.	81	5	•	•			•			104
▲ Cyclone Catalyst	1995	VG Exceptionally load tolerant and very refined in delivery. Extra options available in future	74									80
▲ Denon PMA-350	190	G Bold claims were made at its launch but the sweet and inoffensive sound, though very pleasant, is not mould-breaking	88	5	•	•						92
▲ Denon PMA-450	250	G+ Denon's latest integrated amp swept the board with its big, brassy if somewhat extravagant sound.	99	5	•	•						116
▲ Dual CV600RC	160	G A very lively, open and vibrant sound. Slightly sanitised via CD perhaps, but still damn good for a features-first integrated ampl	63	5	•	•				•		104
E.A.R. 549	5400	VG Valves imitating trannies give exceptional power delivery but not the delicacy and transparency one expects	200							•		60
▲ E.A.R. 802/509mkII	4200	VG Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100	6	•	•			•	•		63
EMF Audio Sequel	349	G+ A fresh start for Mike Creek has resulted in the Sequel, a minimalist amp with a very refined but mildly restrained sound	47	4	•	•						109
▲ Exposure XI/XII/VIII Super	1650	VG New preamp and improved power amp led to a smooth and refined sound, MM/MC less transparent than CD	61	5	•	•			•	•		80
▲ Grant G60AMS	1300	G+ Neat and compact valve monoblok gave good sound on the 8ohm tap, better still on 4ohms. The midrange was particularly natural	60							•		57
▲ Harman Kardon HK6150	190	G+ Based on the older HK6100 but with a more solid, punchy and expressive performance that attracted considerable praise	44	5	•	•						109
▲ Harman Kardon HK6250	250	G+ Heavily based on the cheaper HK6150, this version offers slightly more power with a similarly gutsy and expressive sound	51	5	•	•						116
Harman Kardon HK6850	800	G This monster is derived from the HK6800 with a similarly deep and powerful sound but a rather steep price tag	101	6	•	•			•	•		109
Heybrook C3/P3	1379	A Heybrook has improved the manufacture of its power amp though flaws in the preamp's disc input remain	146	4	•	•			•	•		104
▲ Heybrook Signature	2014	G+ A stunningly powerful and vivid-sounding combination which is equally impressive via vinyl or CD	148	4	•	•			•	•		109
JVC AX-A342	170	A A value-conscious budget amp offering plenty of power but a slightly untidy and inconsistent sound	77	5	•	•						109
▲ JVC AX-Z1010	650	G+ One of the best behemoths: a big amp with a big, boppy and unmuddled sound and a couple of ancient 16-bit DACs for good measure!	124	6	•	•			•	•		109
▲ Jadis JP30/JA30	10750	E French tubes. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at frequency extremes	30	4	•	•			•	•		60

The new Audiolab 8000T Tuner



The Audiolab product range:
8000A Integrated amplifier
8000C Pre-amplifier
8000P Stereo power amplifier
8000T FM/AM tuner
8000M Monobloc power amplifier
8000DAC digital-analogue convertor
Winner of '92 *What Hi-Fi?* award for "Best CD upgrade"
Winner of '92 *Audiophile* award for excellence



AUDIOLAB

Amplifiers continued

Product	Price	Comments	Output W/R	Line inputs	MM	MC	Integrated	Preamp	Power amp	Headphone socket	Remote control	Issue No.
Kelvin AZ1	700	A This latest Absolute Zero still sounds animated but also rather more synthetic and crude. It's also rather more expensive.	100	6								116
▲▲ Kenwood KA-3020	160	G+ An unassuming little amplifier that turns in a remarkably balanced and entertaining sound. Lively, detailed and engaging	66	5	•							97
Kenwood KA-4020	200	A+ On paper this a beefier version of the '3020 yet our listeners thought it sounded weaker, lacking richness and detail	103	5	•	•						97
Kenwood KA-4040R	250	A+ A 'digitised' version of the KA-4020 with full remote control. Unusual looks but can seem insubstantial via CD.	82	5	•	•						104
▲ Kenwood KA-5020	250	G+ This powerhouse on the cheap can keep pace with the most challenging of dynamics. Sound is vibrant but some fine detail is lost	115	6	•	•						92
Kenwood KA-5040R	300	A A flexible amp that uses the old KA-5020 as a building-block. Unfortunately it lacks dynamics, sounding stifled and uninteresting	100	5	•	•						109
▲ Lecson Quattra	370	G Underpowered but with the flexibility of four independent power amps. Very deep, captivating sound with 3D soundstaging.	40	5	•	•						92
Lecson Stereo	230	G+ Can reflect the full weight of a classical performance. Genuinely deep, detailed and enthralling sound	76	6	•	•						104
Linn Intek	448	A+ Linn's no-nonsense Intek still lacks the authority and confidence to support its forward balance.	55	5	•	•						104
▲ Magnum A-Class	599	G+ Lashings of rich and compelling music, trading a hint of lushness for stark accuracy. An unexpected find. Phono stage option	55	7								116
▲ Marantz PM-40SE	250	G+ The improved version of the basic PM-40 model has itself been updated to provide a bigger and more exciting sound	61	4	•	•						97
Marantz PM-62	270	A Attempt to introduce remote control that has failed if the rather flat and uninteresting sound of this amp is any guide.	101	6	•	•						116
Marantz PM-72	350	A This is a very neutral, pleasantly detailed and even-handed performer but one that lacks a sense of emotion or expression	155	5	•	•						109
▲ Meridian 201/205	1285	G+ A fine preamp with option of full system remote, plus competent monoblok power amplifiers with generally good performance	100	6	•	•						62
▲ Moth Series 30	587	G+ A modular system capable of cracking results. The passive preamp and power amp combination warrant a Best Buy in their own right.	35	4	•	•						109
▲ Musical Fidelity Preamp/Typhoon	500	G+ A combination that plays everything close to its chest but bridge the power amp and you'll witness an explosion of detail.	62	6								116
Musical Fidelity Tempest	200	P+ Basic but lusty amp has a disturbingly bright and forward sound, accentuating strings and percussive detail above all else.	62	6								116
▲ NAD 302	160	G+ A spritely and uplifting performance. Sounds loud but never intrusive or fatiguing.	39	5	•							116
▲ NVA AP20	260	G+ Utilitarian amplifier sounds gentle and restrained but is euphonic and utterly engaging. Optional phono stage	35	4								109
Onix OA-21S/SOAP	730	G- Via MM disc this amp comes alive with a fresh and vibrant sound though its CD input sounds utterly dead by comparison.	60	4	•	•						97
Onix OA22L	300	A+ Nothing genuinely unpleasant about this amplifier, simply that its hurried and lacklustre sound fails to spark the imagination.	39	5								116
▲ Philips FA-930	200	A+ Radical styling hides a digital switching facility plus full remote control over what is Philips' best effort to date	99	5	•							109
Philips FA890	230	G- Based on the FA880 model but tarted-up with a remote control facility. Inoffensive, civilised but unexciting sound is retained	120	6	•	•						97
Pioneer A-300X	200	A+ This revamped version of the A-300 was also more confident sounding via CD than MM, yet our panel were still left unmoved.	55	5	•	•						116
▲▲ Pioneer A-400	280	VG Pioneer's design concept snaps into focus with an amp that seems to bubble with musical detail. A budget bench-mark	71	5	•	•						92
Pioneer A-676	300	A- A lusty amplifier at a modest price yet one that failed to inspire our listeners with its bland, indifferent sound	98	7	•	•						109
Pioneer A-777	450	A- A larger version (!) of the A-676 that offers more power but an equally sluggish and uninspiring sound	121	7	•	•						109
▲ QED A270CD/PA	370	G+ Recent updates have bolstered the output of the A270 without adding to its colorations. The PA phono option is a touch expensive	61	5								97
▲ QED C300/P300	630	G A cost-effective combo, limited in its resolution but less beguiling as a result. Disc stage is sweeter but samey	58	3	•	•						85
Quad 34	388	A Well-built durable preamp, filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4	•	•							44
Rational Audio	175	A+ Wacky Czechoslovakian amp offers a very open and fluid sound via CD but its MM performance depends on cartridge load impedance.	129	3								92
Ray Lumley Model 75	1995	G+ Valve monobloks represent good value. What they lack in musical subtlety they make up for in sheer muscle.	75									78
Rega Elex	298	A Minimalist amplifier that sounds too forward, hard and unforgiving for its own good. Shows plenty of promise, however.	51	4	•	•						116
▲ Rose RV-23	425	G+ Beautifully built British 'hybrid'. You can spend more to get a more transparent sound but it's hard to criticise at the price	3	•								77
▲▲ Rotel RA-930AX	180	G+ This budget wonder captivated our listeners with its clean, vibrant and thoroughly involving sound	53	3	•	•						104
▲ Rotel RA-940BX	250	G Rotel's cheapest 'BX' amp prompted a mixed reaction, some finding it muddled while others thought it 'exceedingly musical'	53	5	•	•						109
▲ Rotel RA-960BX	275	G+ If you like music to harbour a latent rather than blatant sense of power this amp's confident restraint could be just the ticket.	88	5	•	•						116
▲ Rotel RC-960BX/RB-960BX	350	G- Excellent standards of construction, flexibility and plenty of power under the bonnet, an ideal choice for the first-time buyer.	80	5	•	•						104
Rotel RC-980BX/RB-980BX	700	A Plenty of watts per pound, sound is expansive but lacks a sense of poise, of control and fine detail - a disappointment	143	5	•	•						109
Sansui AU-X111	100	A An amp that's both solid and flexible for the price, but its sound is rather bland compared to competition in the £110 sector	52	5	•	•						92
▲ Sansui AU-X911DG	800	G+ At its best when used with the on-board MASH/PWM DAC where it sounds technically neutral but still emotionally charged	112	7	•	•						85
▲ Sony TA-F440E	200	G A new budget amp based on tried-and-tested circuits. A fresh and up-beat sound with plenty of detail, can sound smeared via CD	109	5	•	•						104
Sony TA-F540E	250	G- An MC input but little else over the TA-F440E. Sounds more consistent from input to input but is still rather superficial	108	5	•	•						104

To get the full picture –
 why not order a back issue.
 For details turn to page 92

Amplifiers continued

Product	£Price	Comments	Output W8Ω	Line inputs	MM	MC	Integrated	Preamp	Power amp	Headphone socket	Remote control	Issue No.
Sugden A21a	469	G The modern-day relative of Sugden's original Class A amp and one that offers a smooth, easy-going sound.	25									92
TEAC A-X5000	230	A- This amplifier is compromised by a grey and muddled sound that taxed the concentration of our listeners. Better via MM disc	107	6	•	•	•	•				97
▲ Technics SU-VX600	220	G The first 'tweaked' amp from Technics, its solid and sharply focused sound a taste of things to come.	90	5	•	•	•	•				104
Technics SU-VX720	250	A+ Big and spacious sound either appears rough and blustery or impressively grand depending on the music at hand.	84	5	•	•	•	•			•	116
Technics SU-VZ220	100	A- Cheap, cheerful and pretty flexible to boot the SU-VZ220 quickly sounds thin, splashy and relentless when the going gets tough	50	4	•	•	•	•				109
Threshold FET 10e/SA-4	11852	G+ Almost valve-like limpidity and excellent soundstaging are star qualities of the Threshold amps	100	7	•	•	•	•	•			Col
Woodside ISA230	900	A Smooth and inoffensive valve amplifier if one that lacks the sparkle and euphony required for a truly entertaining sound.	27	5	•	•	•	•				116
Woodside SC26/STA35	2743	G+ Synergistic pairing with a cool, controlled sound, good focus and transparency, More about poise than grunt	35	5					•	•		100
▲ YBA 1 power amp	3999	E Well finished power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85							•		62
▲ YBA 1 preamp	3650	E A front line French audiophile product. Great stereo and a fine Krell style finish	5	•	•	•	•	•				62
▲ YBA 2	3624	G+ Superbly finished with very good space and transparency, slightly softened bass. Needs transformer for MC cartridges	70	5	•	•	•	•	•			56
YBA 3	2350	G This duo produced see-through, ethereal stereo images that were more convincing towards the centre of the soundstage	56	4	•	•	•	•	•			72
Yamaha AX-550	260	G Neutral yet lacks the ability to involve on an emotional level	131	5	•	•	•	•	•		•	97
Yamaha AX-750	400	A Impressive handling, but two samples split the opinion of our listeners, one sounded squashed the other fast and articulate	149	5	•	•	•	•	•		•	104



Cassette decks

The bad odour of copyright theft hangs around the compact cassette, but there is no doubt it is the world's most versatile and ubiquitous music storage medium. Buffs may wrinkle their noses, but are happy to use cassette decks to make up tapes for the car or personal.

There is no problem in connecting a cassette deck to any normal amplifier, but some care needs to be taken in choosing the best tapes for a specific machine. (Trial and error is one effective technique, but many decks have manual bias adjustment and some match up to the tape auto-

matically.) Lab performance and sound quality often go hand in hand, and are frequently somewhat dependent upon factory alignment. The mechanical integrity of the mechanism is another crucial factor, that is reflected in the price.

The columns on the right indicate when the facilities shown in the headings are available on a deck. Dolby B and C offer varying degrees of noise reduction and the HX Pro system gives significant treble improvements with ferric (Type I) tapes. Dolby S increases the level of noise reduction with less signal degradation than B or C.

Three-head recorders allow you to listen to a recording as it's being made, a useful quality control function. Bias adjustment allows you to fine tune the deck to suit different types of tape when recording. Auto calibration is an automatic system for setting bias and Dolby levels. Twin deck offers the option to dub tapes or to play two cassettes simultaneously. Autoreverse is a useful convenience feature, but usually with some mechanical compromise. In the case of twin decks a blob is inserted in this column even if only one transport autoreverses.

Cassette decks

Product	£Price	Comments	Dolby B	Dolby C	Dolby HX Pro	Dolby S	3 Head	Auto calibration	Bias adjust	Twin deck	Autoreverse	Issue No.
▲ Aiwa AD-F410	100	A Comparable to AD-F500 but cheaper: Good all round performance, well adjusted, useful basic and not so basic features	•	•	•	•	•					99
▲ Aiwa AD-F500	160	G Noise levels are a little higher than usual, but sound quality is otherwise very good - open, explicit and very neutral tonally.	•	•	•	•	•					93
▲ Aiwa AD-F810	200	G First class budget 3-head machine with a dual capstan transport that really works at reducing the 'fudge' factor	•	•	•	•	•					99
▲ Aiwa AD-WX929	200	A Superbly equipped twin deck that works and works well - remote control	•	•	•	•	•				•	117
▲ Aiwa XK-S9000	700	G+ Fabulous build, clunky transport and sharp, refined sound quality with Dolby S or B and metal tapes	•	•	•	•	•	•	•	•		105
Akai DX-57	220	G Eschews fancy gadgets for a good transport and decent electronics. Sound quality is firm and tidy but avoid Dolby C.	•	•	•	•	•	•	•	•		105
Akai GX-65	300	A Fine ingimmicky middle ranking deck with simple, purposeful controls, works best with metal tapes. Performance fair to good	•	•	•	•	•	•	•			87
▲ Akai GX-95II	440	G+ Sharp, clear and articulate sounding deck, with superb performance extending to frequency extremes	•	•	•	•	•	•	•	•		99
Akai GX-R35	220	A Middling sound quality at best with Dolby B; deteriorates with Dolby C	•	•	•	•	•	•	•			99
▲ Akai GX-W45	320	A Costly but musical high-spec dual deck, doesn't like modern high energy Type IIs and IVs. Good stability and clarity	•	•	•	•	•	•	•		•	111
▲ Arcam Delta 100	850	E Superb transport and a ripe, spacious sound. The Dolby S installation more successful than most. Some replay incompatibility	•	•	•	•	•	•	•	•		111
▲ Denon DRM-510	150	A+ An amnesic Dolby switch and lack of timer standby detract from an otherwise strikingly successful deck with a good performance	•	•	•	•	•	•	•			99
Denon DRM-710	250	A Although this is a fair performing model, the design has lost some of the competitive edge of its predecessor, the DRM-700.	•	•	•	•	•	•	•			105
▲ Denon DRS-610	180	G Unique loading mechanism provides stability, and the deck has a crisp, clean quality. Occasionally anaemic bass.	•	•	•	•	•	•	•			111
Denon DRS-810	300	A Basically good deck with non-stressful material let down by an inability to deal with high energy tapes properly.	•	•	•	•	•	•	•			105
▲ Denon DRW-650	200	A This simply equipped model is a little fiddly to operate at times, but sound quality is generally workmanlike - good value	•	•	•	•	•	•	•		•	93
Dual CC800RS	170	A- Low(ish) cost auto-reverse deck. Delivers a punchy but ultimately rather crude impersonation of source material, thin, lightweight bass.	•	•	•	•	•	•	•			105
Harman Kardon DC5500	500	A Workmanlike sound quality offset by high price and inexplicable shortcomings like 'forgetful' Dolby switching and no timer support.	•	•	•	•	•	•	•		•	117
Harman Kardon TD4600	600	A Original Dolby S deck has improved over the years and now sounds very acceptable. A strong, solid sounding deck - but expensive.	•	•	•	•	•	•	•			117
JVC TD-R452	180	A- Tidy, stable but ultimately rather soul-less experience. Auto-reverse is useful though.	•	•	•	•	•	•	•			117
▲ JVC TD-V1010	400	E Very high grade enthusiasts deck with almost CD-like resolution and stability, especially with Type IV tapes	•	•	•	•	•	•	•			111
JVC TD-X352	150	A- Disappointingly amorphous sound despite decent measured results.	•	•	•	•	•	•	•			117
▲ Kenwood KX-3050	160	A Acceptable sound quality marred only by a loss of midband analysis and slightly edgy treble.	•	•	•	•	•	•	•			117
Kenwood KX-5030	200	A Confusing mishmash of listening impressions caused by poor set-up afflicting metal tapes and Dolby C in particular. Promising otherwise	•	•	•	•	•	•	•			99
Kenwood KX-5530	190	A- Neat looking, well equipped deck, adequately engineered but somewhat lacking musically. Worth considering if auto-reverse is a must	•	•	•	•	•	•	•		•	105
▲ Kenwood KX-7030	260	G Fine, articulate middle price cassette deck whose only (mild) failing with some programme material is a just perceptibly synthetic glaze	•	•	•	•	•	•	•			99
▲ Marantz CP230	330	A This is a competitively priced portable recorder though not suited to replay of musicassettes	•	•	•	•	•	•	•			52
▲ Marantz CP430	400	A Uniquely flexible and compact package for outside work which at a pinch can double as a domestic cassette deck	•	•	•	•	•	•	•			87
Memorex SCT-5	150	P Poor example of a twin cassette deck where everything has been sacrificed on the altar of flexibility	•	•	•	•	•	•	•			87
▲ Nakamichi DR-1	780	VG Typically idiosyncratic Nakamichi with manual everything, Good azimuth adjustment and dynamic, authoritative sound.	•	•	•	•	•	•	•			117

Cassette decks continued

Product	£Price	Comments	Dolby B	Dolby C	Dolby Pro	Dolby S	3 Head	Bias adjust	Auto calibration	Twin deck	Autoreverse	Issue No.
▲ Nakamichi RX-202E	600	G+ Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control	•	•					•			63
▲ Pioneer CT-339	150	A Auto BLE tape alignment is the most interesting feature. Sound quality is a little flaky.	•	•	•							105
Pioneer CT-676	250	P Dull, compressed and hard sounding deck, which is hamstrung by high measured transport flutter.	•	•	•							99
Pioneer CT-900S	500	A High spec and well built derivative of CT-93, but disappointingly lacklustre sound	•	•	•	•						99
▲ Pioneer CT-91a	550	G+ Superb, near state of the art deck with excellent dual capstan transport and capable electronics. At the price, this one is a mould breaker	•	•	•	•			•			75
▲ Pioneer CT-93	800	E State of the art deck, built like something out of NASA's shuttle, with superb all round performance	•	•	•	•			•			99
▲▲ Pioneer CT-S410	200	A+ Powerful selection of features, excellent ergonomics and the fine, explicit sound with metals, though some instability was noted	•	•	•	•			•			111
▲▲ Pioneer CT-S510	240	A- Slightly highlighted balance, but open and detailed, and backed by a basic but excellent set of features	•	•	•	•						117
▲ Pioneer CT-S610	270	G+ Exactly engineered and highly articulate up-market cassette deck. Imagery and dynamics are finely resolved	•	•	•	•						111
Pioneer CT-S910	500	G+ Refined and able performer, strong detail and excellent imagery, but slightly laid back.	•	•	•	•						117
Pioneer CT-W601R	200	A- Mediocre performance attributable to flimsy build and less than stable transport. Frequency responses not wholly accurate.	•	•	•							111
▲ Pioneer CT-W650R	200	A There were some intermittent problems with the tape alignment system on the test sample, but the deck was otherwise good,	•	•	•							105
▲ Revox B215	1322	G+ Fine, consistent and solid sound, excellent under the skin engineering and many useful features — but you're also paying for it	•	•	•	•			•			87
▲ Revox B215-S	1697	G+ This is a superbly engineered deck with a classically fine performance that almost transcends the stereotypes.	•	•	•	•			•			75
Revox Professional Series C115	1083	G Not for the numbers freaks, it's unobtrusively musical, with a slightly wayward top and a very clean, extended bass	•	•	•	•			•			111
Sansui D-X111E	120	P Very high levels of flutter, and a shabby, hollow sound with metallic colorations and a severe loss of detail - is it necessary to go on?	•	•	•							105
Sansui D-X117WR	220	P Bass is thin and coloured, and the sound lacks dynamics, pitch accuracy and overall stability - the sound is neither stable nor solid	•	•	•							111
▲▲ Sansui D-X211HXR	170	G Clean, stable and open sounding recording quality distinguishes this player, - and auto-reverse too. Excellent value.	•	•	•	•			•			93
Sansui D-X311WR	250	A- Not wholly successful auto-reverse deck which suffers because it has tried to be all things to all people. Lack of clarity is main limitation	•	•	•							99
Sherwood DD-3010C	150	P Good range of features, let down by poor transport and iffy electronics.	•	•	•							117
▲▲ Sony (WMD6C) Pro Walkman	280	G+ One of the finest sounding cassette decks on the market today. A mandatory Best Buy, which also fits in your pocket	•	•								60
▲▲ Sony TC-K520	180	G Fine, assured and detailed performer with a very well designed and straightforward user interface	•	•	•				•			87
Sony TC-K870ES	350	A+ Good but not outstanding deck which proved slightly disappointing on audition. This model is no standard setter	•	•	•	•						99
TEAC R-9000	500	G Much better than average auto-reverse deck, well worth considering. Nicely engineered too.	•	•	•	•			•			105
TEAC V-7000	480	G Intrinsically sharp, clear and solid sound spoiled by exaggerated detail with prerecorded material and losses imposed by Dolby circuits	•	•	•							99
▲ TEAC V-8000S	700	G Superb stability and real subtlety, this must be the best TEAC yet. The only disappointment was the Dolby C	•	•	•	•						105
▲▲ Technics RS-BX626 II	180	G First rate deck at a bargain price. Losses when recording are low and mostly benign, an all-round achiever	•	•	•	•						111
Technics RS-BX828 II	300	G Fine deck, with explicit detail and stability, but in the final analysis it doesn't go much further musically than the cheaper RS-BX626	•	•	•	•						111
▲▲ Yamaha KX-260	160	A Lively, entertaining deck that trades gadgets for a convincing performance at an attractive price point	•	•	•	•						111
Yamaha KX-360	200	A Performance has both dryness and precision. Good - but doesn't 'breathe,' and occasionally sounds unstable	•	•	•	•						111
▲ Yamaha KX-650	260	G Fine audio manners, especially in the midband and treble, mark this high class deck out from the crowd	•	•	•	•						99
Yamaha KX-W362	250	A- Almost a good deck, it is let down by audible levels of wow & flutter, apparent even with prerecorded material, audio circuits are good	•	•	•							111



CD Players

Now over a decade old, this all digital music source is well established despite high disc prices and the opposition of some hi-fi enthusiasts. Compact Disc's strengths over conventional vinyl are complete freedom from surface noise, ease of use, and more robust software.

However, many vinyl enthusiasts still find CDs sound less involving than top quality vinyl. But, with the dominance of CD in the high street, even vinyl die-hards need a CD player today.

The columns on the right indicate when the facilities shown in the headings are available on a CD player: DAC type indicates the type of convertor chip used in each player, 16, 18 and 20-bit are multi-bit types, all the others are bitstream variants. In much the same way that an amp's output is not indicative of its sound quality, the chip used in a DAC isn't the only determining factor in a CD player's sound, but it is an important one. Remote control is not yet universal, and we have included a tick box, more to show which

machines don't have one than which do. The existence of electrical and/or optical digital outputs is important for future upgrading with an outboard DAC, as a rule electrical outputs are the most desirable. Phase inversion in the digital domain is rare on one box players but can make quite a big difference if you've got golden ears. Headphone sockets are useful but beware of those without volume controls. Track entry keypads are those with calculator style buttons which makes track access much quicker.

CD Players

Product	£Price	Comments	DAC type	Electrical digital output	Optical digital output	Remote control	Track entry keypad	Headphone socket	Phase invert	Issue No.
▲ Aiwa XC-300	150	A+ Cheap, cheerful and gratifyingly free of digital 'nasties', well-equipped but safe rather than thrilling on the sonic front.	Toshiba BS	•	•		•			107
Aiwa XC-750	180	A A refined version of the XC-700, sadly it has lost the magic of the original	SAA7350	•	•		•			119
▲ Arcam Alpha Plus	420	G+ As its name suggests, this is the 1992-version of a classic 16-bit player with an all-round smoother sound!	16-bit	•	•					112
Arcam Delta 70.3	650	G+ A distinctly rugged, beefy sound. Plenty of power behind individual instruments but lacks a feeling of involvement	7350 PDM	•	•					95
Aura CD-50	400	G- Based on an older Philips board with new CDM9 transport, this is a slim player with an innocuous sound	SAA7321	•	•					119
AVI S2000MC	999	G+ A stylish, midi-width player with an exceptionally refined and comfortable sound. Lacks passion	20-bit	•	•					119
Cary Audio Design CAD-955	899	A+ Rotel with add-on valve processor to filter-out any RF. Nice idea but sounds very dry and taut, lacking warmth and body.	16-bit	•	•					107
Creek CD60	500	G A big and confident sound from a player that's 'into' green. So it looks ghastly even if the internal design is very thoughtful.	16-bit	•	•					107
Denon DCD-1290	330	G- Looks the business but sound is a real five-minute wonder. Its compelling fizz lasts about as long as a firework.	18-bit	•	•	•				107
Denon DCD-2560	600	G Beautifully built but decidedly sluggish, particularly through the bass. Vocals are more forward but can sound a little glassy	20-bit	•	•	•				95
Denon DCD-890	270	G- Similar to the DCD-1290 in its execution, sounds lively and powerful but lacks subtlety.	18-bit	•	•	•				112
Dual CD1080RC	200	A- Strange-sounding player with a top-heavy treble that does little to redress its lack of vibrancy and emotion	MASH/PWM	•	•					107

CD Players continued

Product	£Price	Comments	DAC type	Optical digital output	Headphone socket	Track entry keypad	Issue No.
Goodmans GCD-658	170	A- A 6+1 magazine-loading autochanger with an exaggerated and often aggressive sound	Hybrid	•			• 117
Harman Kardon HD7450	260	A+ Dominated by a budget decoder/oversampling IC. Good bass nevertheless but pop tracks can sound fizzy and tiring.	18-bit	•	•		• 107
▲ Harman Kardon HD7500II	300	G+ Tonal integration is very good, packed with detail that's expressed with enthusiasm.	MASH	•	•	•	• 95
Harman Kardon HD7600II	400	A+ HD7500II with a motorised volume control and extra-heavy casework. Lacks the transparency and sparkle of the cheaper machine	MASH/PWM	•	•		• 100
Harman Kardon TL8500	500	A This 5-disc carousel player sounds civilised enough but lacks the detail and finesse of its peers	MASH/PWM	•			• 117
JVC XL-M406	270	A A 6+1 disc magazine-based autochanger with a rather lean, bright and disappointingly synthetic sound	PEM	•			• 117
JVC XL-V152	130	A Based on earlier budget designs but minus a remote control. The voluminous but vague sound is equally familiar.	PEM BS				• 112
JVC XL-Z1050	500	A Technically advanced and luxuriously equipped, this player remains rather bland and unsatisfying on audition	PEM bitstrm	•	•	•	• 119
▲ JVC XL-Z452	180	G+ Another lightweight player but graced with a surprisingly bold and detailed sound. Impressive stuff for the money.	PEM BS	•			• 112
▲ Kenwood DP-3040	180	G+ The sophisticated sound of this budget player could teach Kenwood's costlier offerings a thing or two!	NPC BS	•			• 112
Kenwood DP-5040	200	A Better built and technically superior to the older DP-5030 but its untidy, detached treble quality proved a real disappointment	PLM	•	•		• 107
Kenwood DP-7050	320	A Kenwood's first sowing of Philips' Bit Stream technology has fallen on stony ground judging by its dry and awkward sound	SAA7350	•	•		• 119
Kenwood L-1000D	830	G A beautifully constructed and very stylish player that really only gives off its best when used in balanced	16-bit	•	•	•	• 100
▲ Kenwood DP-M6640	250	G This 6+1 CD multichanger is hardly the slickest available but it still sounds impressively open and detailed	PWM	•			• 117
▲ Linn Karik	1497	VG Based on Linn's original CD transport, this player sounds dry but very positive, detailed and engrossing	Crystal BS	•	•		• 119
▲ Marantz CD-52II	230	G Launched to usurp the position of its own CD-52SE, the '52II is less colourful but equally appealing	SAA7350	•	•		• 119
▲ Marantz CD-52IIE	300	G A new mains transformer plus the full complement of internal mods has recaptured the frothy if startling sound of the original '52	SAA7350	•	•		• 119
Marantz CD-72	400	G+ A heavily-constructed player. This implementation sounds astonishingly solid and immediate but also rather too 'clean'.	bitstream	•	•		• 107
Marantz CD-72SE	500	G+ A recommendation just eluded the grasp of this superbly built player thanks to its very polished but restrained sound.	bitstream	•	•		• 112
▲ Meridian 206ΔΣ	995	E A new variation on the 206 theme with the most liquid and captivating sound to date	Crystal BS	•	•	•	• 119
▲ Meridian 208	1550	E State of the art CD sound combined with a decent preamp and full remote control	bitstream	•	•	•	• 83
Micro Seiki CD-M100	5541	G Extravagantly styled, finished and built. The good lab performance led to an only 'good' sonic display	16-bit	•	•		• 72
Micromega Logic	500	G A version of Philips CD624 with new op-amps and CD tray. Still, it sounds rather meatier, better integrated and more purposeful	SAA7321	•	•		100
Mission DAD5	300	A+ Similar to Philips' 600-series: lively, plenty of space and full of 'bounce' but a little too eager to impress in the short term	bitstream	•	•		• 107
▲ Musical Fidelity CDT	500	G+ Oddball player with a cheap top-loading transport and appalling digital gubbins yet saved by the euphony of its valves!	hybrid				112
▲ NAD 502	200	G This updated version of the 5425 has traded the spontaneity of its forebear for a more precise but mechanical style of music	MASH/PWM	•	•		• 119
▲ Philips CD920	150	A+ A new budget player with an appalling technical record but a surprisingly clean if understated sound	SAA7341	•	•		• 119
Philips CD930	180	G- Featuring digital circuitry similar to Marantz's players but a sound that's a little too ripe and soft.	bitstream	•	•		• 112
▲ Philips CD950	350	G+ Philips' top 900-series player is the first to employ its advanced DAC7 chipset. Sounds very crisp, clear and confident.	DAC7	•	•		• 112
▲ Pioneer PD-201	150	G A budget player with a genuinely fizzy and exciting sound. Hardly neutral but audacious and entertaining nevertheless.	PDM BS	•			• 112
Pioneer PD-75	800	G+ A confident yet beautifully poised and relaxing sound from an equally luxurious package. Oodles of refinement	PDM BS	•	•		• 107
▲ Pioneer PD-M701	300	G+ A 6-disc multichanger from the originators of the breed. A little untidy perhaps, but still sounds fresh, dynamic and exciting	PDM	•			• 117
Pioneer PD-M901	400	A Another 6-disc multichanger based on the PD-M701 but with the addition of various 'Sound Field' options. Listening is hard work	PDM	•			• 117
Pioneer PD-S501	190	A+ The cheapest player to be equipped with a Stable Platter mechanism, but compromises elsewhere have suffocated its flair	bitstream	•			• 112
Pioneer PD-S801	300	G Pioneer's Legato Link digital filtering provides an unpredictable sound. Capable of poor or superb results, depending on system	bitstream	•	•		• 112
▲ Pioneer PD-S901	400	G+ The very refined but confident, crisp and powerful sound of the '901 snatches Pioneer's LLC concept from the jaws of defeat	PFM bitstrm	•	•	•	• 119
Revox B226S	840	A Top quality build and finish for the Revox system enthusiast. For high value sound look elsewhere	16-bit	•			• 76
Rotel RCD-955AX	280	A Repackaged version of the evergreen RCD-855. Our sample disappointed, lacking the clean, cohesive quality of the original	16-bit	•	•		• 107
▲▲ Rotel RCD-965BX	300	E An exceptionally refined bitstreamer: transparent, exquisitely detailed and powerfully emotive. A landmark player	SAA7323	•	•		• 100
Rotel RCD-965BX LE	380	G- This 'tweaked' version of the fabulous '965BX certainly sounds different, but different is rarely better	SAA7323	•	•		• 119
▲ Sansui CD-X217	230	G- Sansui has returned to its roots judging by the balmy and very comfortable sound that pours from this player	MASH/PWM	•	•		• 119
Sansui CD-X317	300	A Not in the same class as older CD-X311 mkII. Same technology but the sound is neither as responsive or engaging	MASH	•	•		• 107

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CD Players continued

Product	£Price	Comments	DAC type	Optical digital output	Critical digital output	Remote control	Track entry keypad	Headphone socket	Phase invert	Issue No.
Sansui CD-X617	300	A This 'double-DAC' version of the CD-X317 is more impressive, sounding light and tizzy with pop but dull with classical CD's	MASH	•	•	•	•	•	•	112
▲ Sansui CD-X711	600	G+ Luxury features, finish and sound from this classy Sansui; excuses required here	bitstream	•	•	•	•	•	•	83
▲▲ Sherwood CD-3020R	120	G Although this budget wonder has little respect for musical convention, what emerges is still remarkably entertaining	NPC bitstrm	•	•	•	•	•	•	119
▲▲ Sherwood CDC-5010R	200	G+ This highly affordable 5-disc carousel player sounds unexpectedly deep, spacious and involving - a rare find	PDM	•	•	•	•	•	•	117
▲▲ Sony CDP-397	140	G The first CD player to be almost entirely composed of miniature surface-mount components. Unsophisticated but enthusiastic sound	PLM	•	•	•	•	•	•	112
▲▲ Sony CDP-597	180	G This lightweight version of the acclaimed CDP-797 is equally flexible but provides a slightly warmer and smoother sound	PLM bitstrm	•	•	•	•	•	•	119
▲ Sony CDP-797	200	G- Succeeds with its taut imaging, clean and impressive soundstaging. Can seem a little too lean or dry, however.	PLM	•	•	•	•	•	•	107
Sony CDP-X229ES	300	G- Built to the same standards as the CDP-X339ES but with a colder and less forgiving sound. Lacks a sense of integration	PLM	•	•	•	•	•	•	112
Sugden SDT-1	850	A Bearing in mind Sugden's SDA-1 converter lies at the heart of this player, its unpredictable performance is disappointing	16-bit	•	•	•	•	•	•	119
TEAC CD-P3500	170	A A well-meaning attempt to pare-down the CD-P4500 results in a similar looking player with a thoroughly uninspiring sound	bitstream	•	•	•	•	•	•	112
▲ TEAC CD-P4500	250	G TEAC's first genuine 1-bit player its sound described as having a certain 'organic warmth', very composed and easy-going.	SAA7350	•	•	•	•	•	•	107
TEAC VRDS-10	769	A+ A basic analogue stage compromises the potential of TEAC's superb engineering and digital electronics. Lacks bass energy	DAC7	•	•	•	•	•	•	119
▲ Technics SL-PG320A	140	G+ A cheaper and remote-less version of the '420A with an equally dry but vivid, spacious and astringent sound. A good 'un	MASH	•	•	•	•	•	•	112
▲ Technics SL-PG420A	160	G+ Offers an open, transparent and uncommonly fresh sound but a little of the 'magic' is missing.	MASH	•	•	•	•	•	•	107
▲▲ Technics SL-PG520A	200	G+ A cracking player. Superb clarity and dynamics, thrilling but musically involving too	MASH	•	•	•	•	•	•	107
▲▲ Technics SL-PS620A	230	G+ A costlier, tarted-up version of the SL-PG520A that loses very little in the way of clarity, sparkle or in compelling dynamics	MASH	•	•	•	•	•	•	112
▲ Technics SL-PS840	420	A A very refined but highly detailed and engrossing performance from just about the fastest, slickest player on the planet	MASH/PWM	•	•	•	•	•	•	119
Technics SL-PS900	350	G- Just about the quietest transport in existence and a sound that is equally unobtrusive, polite and refined	MASH	•	•	•	•	•	•	100
Woodside WS2	1095	G+ Responded well to our jazz and classical selection but sounding bright and grainy with the pop CD's	16-bit	•	•	•	•	•	•	95
Yamaha CDX-560	180	G An advance on the CDX-450 the light, up-front if t entirely welcoming sound of this newcomer could shock the timid listener	18-bit	•	•	•	•	•	•	112
▲ Yamaha CDC-625	300	G A reassuringly solid 5-disc carousel player that sounds smooth, cultured and 'delicately proportioned'. Good value	Hybrid	•	•	•	•	•	•	117
▲ Yamaha CDX-660	249	G This cheaper iteration of the CDX-860 provides a similar mix of features with a slightly slower but heavier sound	PDM DAC	•	•	•	•	•	•	119
▲ Yamaha CDX-860	280	G+ Probably Yamaha's best player to date: powerful and confident yet delicate and nimble when the occasion demands	PDM	•	•	•	•	•	•	112



CD Transports and DACs

A CD player can be split into two basic components, the mechanism which reads the information from the disc, called the transport, and an electronic device which turns the digital bitstream coming off the disc into an analogue audio signal, this is called a digital to analogue convertor or DAC. Although at the lower end of the market both of these are contained in a single box, the best CD players are usually two box affairs.

Although many of these units will be purchased as matching pairs, a DAC can also be used to upgrade an existing CD player. For instance an early machine with a satisfactory transport but a dated convertor can be rejuvenated by adding an outboard DAC.

The columns on the right indicate when the facilities shown in the headings are available on a transport or DAC. Remote control is not yet universal, and we have included a tick box, more to show which machines don't have them than which do. The existence of electrical and/or optical digital in and outputs is pretty fundamental to transports and DACs, as a rule electrical outputs are the most desirable. Class 1 transports are those with an output whose crystal clock accuracy is better than ± 50ppm (parts per million), certain DACs won't lock onto (and thus can't be used with) transports with a lower clock accuracy. DAC type shows the specific convertor chip employed, multi-bit indicates the use of a 16-bit, four times oversampling chip. In much the same way that an amp's output is not indicative of its sound quality, the chip used in a DAC isn't the only determining factor in a CD player's sound, but it is an important one. Phase inversion in the digital domain can make quite a big difference if you've got a high resolution system and golden ears to go with it, and is worth having.

The choice of interconnect used to link drives and DACs is also important. Despite the fact that you are conveying a digital bitstream differences can be heard between interconnects and conventional interconnects, a dedicated 75ohm digital cable will give the best results.

CD Transports

Product	£Price	Comments	Remote control	Electrical digital output	Optical digital output	Class 1	Issue No.
Kenwood DP-X9010	500	A+ Compromised by jitter, RF noise and poor clock selection it encourages a dynamic but bright and edgy sound with most DACs	•	•	•	•	96
▲ Meridian 200	895	G+ Broadly compatible and offering a light, fresh and very bubbly sound that is both natural, engaging and unfatiguing	•	•	•	•	96
Meridian 602	1750	G This dedicated CD transport teams-up most successfully with the 606 DAC. Otherwise it lacks the life and pizzaz of the 200	•	•	•	•	96
▲ TEAC P-10	1499	G+ A chunkier and altogether more successful transport than the P-500 with an especially beefy and compelling sound. TEAC's best	•	•	•	•	96
TEAC P-2	3300	G Beautifully styled and constructed but sound is bleached and generally less inspiring than that of the P-10	•	•	•	•	96
▲ TEAC P-500	649	G+ Provides a smooth and very sympathetic sound yet is also rather vague, lacking the crispness and resolution of its peers	•	•	•	•	96
Technics SL-PA10	470	G Has the unusual limitation of only optical output. Reassuringly solid and more immune to vibration than most	•	•	•	•	88
Wadia WT2000	5614	G+ Active digital output and alloy casework. Dynamic and crisp sound best realised with Wadia DACs, otherwise less impressive.	•	•	•	•	96
▲ Wadia WT3200	1800	VG Based on Marantz CD-95DR with new casework and active output. Very clean, clear and authoritative with Wadia and Philips based DACs	•	•	•	•	96

DACs

Product	£Price	Comments	DAC type	Electrical digital input	Optical digital input	Phase invert	Issue No.
▲ Arcam Black Box 3	300	G+ Top of a series of three decoders it can offer a high sonic standard with top class transports	Bitstream	•	•	•	88
Arcam Black Box 5	450	G Equipped with Sync Lock for D170.3. It gives off its best with a standard 75ohm transport like the TEAC P-10.	hybrid	•	•	•	113

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DACs continued

Product	£Price	Comments	Electrical dig input	Optical dig input	Phase invert	Issue No.
▲▲ Audio Alchemy DDE v1.0	420	VG A very sweet and seductive sounding unit that gives good results with a wide range of CD players/transports	Bitstream	•	•	101
Audio Synthesis DSM-M	1234	G+ A weighty but neutral and highly calculated performer, best suited to transports like the P-10, despite Sync Lock facility.	20-bit	•	•	113
Audiolab 8000DAC	700	G Needs Class 1 transport. At its best with Wadia WT3200 where it sounds vivid and alive. Otherwise can sound a little antiseptic	Bitstream	•	•	103
Beard DAP-1	975	A- Clad in a wooden case this marriage of digital technology and valves has hit the rocks, a disappointingly flat sound	16-bit	•	•	113
▲ DPA Digital Bigger Bit	700	G With either P-10 or Meridian 200 transports it delivers a very taut and dynamic sound, bathed in an open acoustic	DAC7	•	•	103
DPA Digital Little Bit (Optical)	400	VG Works especially well with Meridian's 200 transport but does require the services of Deltec's 'Power' mains filter	SAA7350	•		101
DPA Digital PDM1 Series 3	1280	G+ Bears technical comparison with both PDM2 and Bigger Bit but - in terms of sound quality - is great advance on the latter	DAC7	•	•	103
▲ ds/d Decode-1	495	G Elegantly designed bitstreamer with plenty of inputs, can sound too bright, immediate or artificial for its own good.	Bitstream	•	•	113
▲ Forte Audio Model 50	950	VG A typically big and full-blooded sound, infiltrated by a slightly euphonic quality but never hard or gritty.	DAC7	•	•	103
▲ Meridian 203 DAC7	560	VG A broadly compatible DAC that's free of fatiguing nasties yet remains bubbly and exciting	DAC7	•	•	101
Meridian 606 DAC7	1350	G By refining the 203's sound further Meridian have also tempered its vibrancy and 'life'. Fickle with other transports	DAC7	•	•	101
Micromega Duo BSII	550	G Has a tendency to sound light, airy and 'fast' but it can also become a little hard or - fatiguing with some digital outputs	SAA7321	•	•	101
Micromega Microdac	300	A+ Described as a modest but entertaining performer, achieving its sweetest balance with Arcam's D170.3 transport.	SAA7321	•	•	113
▲ Mission DAC5	299	G+ Another modest DAC but one capable of a lean but clean and detailed sound that's typical of the DAC7 breed.	DAC7	•	•	113
▲ NVA DAC-ON	730	G+ DAC-ON actually turns out to be a QED Digit linked to substantial external supplies. A ruse that undoubtedly improves its sound	SAA7323	•		113
PS Audio Superlink	1498	G- Does the business with Meridian's 200 but can sound bloated, smeared and even vaguely electronic other transports	18-bit	•	•	103
▲ QED Digit	139	G+ Bearing in mind its expressive but very forgiving performance the Digit is almost embarrassingly cheap	SAA7323	•		113
Roksan ROK-DA1/ROK-DS4	995	G+ A creditable affair, both expansive and expressive in character but rather also lean in balance.	Crystal	•		113
Stax DAC-Talent	1400	G+ Natural, refined and never over-zealous, its also capable of sounding very spicy and dynamic. Can be a maturing influence	20-bit	•	•	101
▲ Sugden SDA-1	749	G+ A pleasant surprise from the fuddy-duddies of audio, judging by its 'masses of high resolution detail and tremendous dynamics'	TDA1541it	•		113
Sugden Stemfoort PDA-10	1200	G+ Unfortunately this 'upgraded' SDA-1 is less impressive than the original, losing out on dynamics, airiness and subtle detailing	16-bit	•	•	113
Sugden Stemfoort PDA-10	1750	G+ Unfortunately this 'upgraded' SDA-1 is less impressive than the original, losing out on dynamics, airiness and subtle detailing	16-bit	•		113
▲ TEAC D-500	400	G+ Combination of NPC O/S filter and two Philips' DACs. Its broadly compatible. A dynamic and 'interesting' sound	16-bit	•	•	103
Threshold DAC 1/e	3150	G+ Can sound beautifully detailed with a marvellous sense of scale and sharp, solid images. Compatibility is unpredictable	MASH	•	•	103
Wadia DigiMaster X-32	2000	G It can sound bold, dynamic and crisp but lacks the warmth to bind its music together	18-bit	•	•	101
Wadia DigiMaster X-64.4	5000	G+ The X-64.4 positively buzzed with vibrant, sharply-etched detail. An exciting sound	18-bit	•	•	101
Woodside DAC1	909	G Fine but slightly dated and costly package in performance terms - but flexible, musical and t well built	16-bit	•	•	87
▲ Woodside DAC2	510	G+ Offering a sharp and dynamic sound, all the more captivating for its lack of graininess and 'tizz'. A reliable upgrade	16-bit	•		101



DAT

DAT, or digital audio tape, has been on the market for quite some time now but has never really 'made it' as a consumer medium, probably due to the fact that very little prerecorded software has been made available.

In the last year or so it has begun to carve itself a niche at the top end of the market replacing reel to reel tape recorders as the audiophile's

tape based medium.

The DAT standard specifies a 48kHz sampling rate, which is higher than CD, so direct copying in the digital domain is only possible on those machines with dual sampling frequencies, ie 48kHz and 44.1kHz. Some machines also record at 32kHz to give a longer recording time for a given length of tape, this is shown in the LP

mode column.

The optical and electrical in/outputs in the column headings are for digital signals, analogue in/outputs are universal. The AES/EBU and S/PDIF socketry is for connection to professional components and typically DAT machines with this facility have been made for the pro and semi-pro markets.

DAT

Product	£Price	Comments	Electrical in/outputs	AES/EBU in/outputs	S/PDIF in/outputs	Issue No.
JVC XD-Z1010TN	1050	A+ Ambitious but ultimately disappointing deck with an opaque musical delivery and more features than you can shake a stick at	•	•	•	111
▲ JVC XD-Z505	620	G Competent middle market DAT with uncomplicated (but still flawed) user interface, but good basic sound quality	•	•	•	105
Kenwood DX-7	500	A Sound quality is pretty fair, but a little rougher than the best of the breed. Controls are good, the display however is poor	•	•		94
Kenwood DX-7030	700	A- Bland sounding deck that lacks low level clarity and imaging. Build quality is good however and ease of use ranks highly	•	•	•	99
Luxman KD-117	1499	G Slightly soggy, earth-bound sound quality, this model trails the other DAT decks tested so far				63
Panasonic SV-3700	1111	A Slick, powerfully equipped, this pro DAT has a clear, quick and colourful sound somewhat lacking in weight and substance		•	•	111
▲ Sony DTC-55ES	550	G Broadly comparable to a middle ranking CD player sonically, the Sony is particularly well equipped and well priced.		•	•	93
Sony DTC-77ES	1000	A Superb engineering, many nice features (including off tape monitoring) but perceptibly slowed, thickened sound	•	•	•	105
▲ Sony DTC-M100	799	G+ Clean clear sounding second generation model with most of the features and sound of the DTC-1000ES				63
▲▲ Sony TCD-D3	500	G+ At the time of writing, this model represents the state of the art, and beats all comers.	•		•	94
Tascam DA-30	1199	A+ Interesting pro DAT deck with solid, tangible sound quality which is nevertheless lacking in analysis	•		•	111

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Headphones

There are a variety of different approaches to headphone design which are reflected in the range of prices and designs available to the can oriented among you. Amongst the more expensive models, electrostatic drivers used in open-backed phones are a popular option as they offer the sort of transparency and relaxation that only the best loudspeakers can match. The majority of these come with some form of transformer which usually takes the signal

from the speaker terminals on the amplifier, but some can run from a pair of tape out sockets which is a lot more convenient.

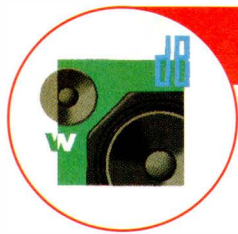
The more down to earth (see affordable) models feature dynamic, or moving coil, drivers in circular open or closed backed designs. The advantage of open backs seems to be a correspondingly open sound, but one can also of course hear external noises. Closed-back designs are useful in situations where it is necessary to

block out background noise, but they aren't generally as good sonically.

Another means of distinguishing different types is the way they sit on your head. There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs feature a flat pad which presses on the outer ear (pinna); and intra-aurals rest inside the ear itself, and are popular with personal stereos because they are visually unobtrusive.

Headphones

Product	Price	Comments	Type	Closed back	Dynamic	Electrostatic	Issue No.
▲ AKG K1000	500	E One of the best dynamics on the market, hooks directly to speaker outputs and makes much of the competition sound lame	Extra-aural	•	•	•	99
AKG K135	33	A The K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural	•	•	•	63
▲ AKG K240 Monitor	60	G Something of a classic, these AKGs are very user friendly in all respects; sonically on the warm side of neutral	Circumaural	•	•	•	63
▲ AKG K280 Parabolic	90	G+ A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural	•	•	•	63
▲ AKG K340	140	E Heavyweight cans in most respects, the K340 with its electrostatic tweeter is a very revealing headphone	Circumaural	•	•	•	75
AKG K44	40	A Good quality personal oriented phone, could have a better sense of space but is musically quite communicative	Supra-aural	•	•	•	99
▲ AKG K500	119	G+ Open and clear, they reproduced music with impressive definition, balance is on the light side but transparency is high	Circumaural	•	•	•	111
Aiwa HP-X30	31	G- A flashy personal stereo phone which alternatively could be used at home. A slight LF tonal preference colours the response	Supra-aural	•	•	•	75
▲ Audio-Technica ATH-308	26	A- Small cans with a fairly forward balance which helps perceived clarity but can become wearing over time, good for personals	Supra-aural	•	•	•	111
▲ Audio-Technica ATH-609	31	A- Warm feeling and sounding with impressive physical substance for the price, could be more relaxed and open	Circumaural	•	•	•	99
Audio-Technica ATH-611	51	G Same basic design as 609 but bigger thinner diaphragm makes this a more relaxed and informative headphone	Circumaural	•	•	•	99
Audio-Technica ATH-9000	246	G Electrets which connect to the amps speaker outputs, it sounds a little too smooth but would suit aggressive amps	Circumaural	•	•	•	111
▲ Audio-Technica ATH-910	70	G The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural	•	•	•	55
▲ Audio-Technica ATH-911	80	VG Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural	•	•	•	63
Beyer DT411	49	G A reasonable but not very thrilling headphone that doesn't really offer enough at the price	Supra-aural	•	•	•	111
▲ Beyer DT911	179	VG Probably too revealing for many headphone amps these are very subtle and fine if expensive cans	Circumaural	•	•	•	111
▲ Beyer DT990	102	VG A significant pair of dynamic headphones; they have a smooth and yet revealing neutral sound that is hard to criticise	Circumaural	•	•	•	55
▲ Beyer IRS690	203	VG High quality infra-red headphones with soft comfy earpads and mellow but informative sound quality which is hard to dislike	Circumaural	•	•	•	75
JVC HA-D690	40	A Competent but rather undistinctive cans, a bit middle of the road and well suited to aggressive sources	Supra-aural	•	•	•	111
▲ Jecklin Float Electrostatic	399	E These electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural	•	•	•	55
▲▲ Jecklin Float Model One	79	G+ Whilst very unusual in appearance, the Floats give remarkable sound quality and openness at a reasonable price	Circumaural	•	•	•	55
▲ Jecklin Float Model Two	99	G+ Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. The lack of adjustment	Circumaural	•	•	•	63
Koss TD/60	20	A Devoid of channel identification with a decidedly Stateside approach to sound, these are very listenable phones for the price	Supra-aural	•	•	•	75
Pioneer SE-72	30	A- Neat, very nicely made personal stereo phones. Sound is on the veiled side, good for aggressive sources	Supra-aural	•	•	•	75
Quart Phone 30 X	40	A Slightly dark character makes these more suitable for some material than others, specifically music that needs bass weight	Supra-aural	•	•	•	99
▲ Quart Phone 95 X	100	G+ Can sound even handed, relaxed and open with a good drive system but may be a bit too transparent for lesser headphone outputs	Circumaural	•	•	•	99
Realistic Pro-X	25	A- Robust, unanimously uncomfortable and heavily veiled in sonic terms. Not a great success	Supra-aural	•	•	•	75
▲ Sony MDR-CD750	73	G+ Reasonably comfortable and eminently listenable these Sonys have characteristically good bass power and relaxed hf	Circumaural	•	•	•	111
▲▲ Sennheiser HD 480II	50	G t the most accurate cans on the market but amongst the most enjoyable	Supra-aural	•	•	•	111
Sennheiser HD 540II	100	G+ A good but not great headphone that due to its high impedance and efficiency should work well with most sources	Circumaural	•	•	•	111
▲▲ Sennheiser HD40	20	G- Very light and comfortable headphones with an even sonic balance that will suit most sources. 6.3mm jack	Supra-aural	•	•	•	75
Sennheiser HD450II	40	G- Makes quite acceptable noises with a variety of outputs, could sound more spacious but is pleasantly relaxed	Supra-aural	•	•	•	99
▲ Sennheiser HD480 Classic II	60	G Same basic design as the 450 but improved sound quality as a result of aluminium coil and extra damping, natural with good bass	Supra-aural	•	•	•	99
▲ Sennheiser HD520	65	G+ A very comfortable and musically capable headphone. If you've got this sort of bread to blow on cans, give 'em a blast	Circumaural	•	•	•	75
▲ Sennheiser HD530	75	G+ One of the better dynamics in its group, the 530s create a sense of space that eludes most sub £100 cans, and they're dead comfy	Circumaural	•	•	•	75
Sennheiser HD560 Ovation II	120	G+ A comfortable and nicely styled headphone that could be more natural sounding at HF, but is detailed and open with good power	Circumaural	•	•	•	99
▲ Sony MDR-CD1000	150	G+ A fine sounding and comfortable headphone that's likely to work well with most sources	Circumaural	•	•	•	111
▲ Sony MDR-CD3000	300	G+ Better than most of the headphone outputs around so hard to make the most of, potentially up there with the electrostatics	Circumaural	•	•	•	99
▲▲ Sony MDR-CD350	32	G Very impressive, possibly the most open sounding cheap closed back can around, lightweight in balance but transparent	Circumaural	•	•	•	99
▲▲ Sony MDR-CD550	50	G+ A very competent headphone, creates a remarkable sense of space for a closed back design and sounds natural to boot	Circumaural	•	•	•	99
▲ Sony MDR-R10	2500	E State of the art design built to the highest standards. Sound quality reflects this care, being big, clear, sweet and refined	Circumaural	•	•	•	72
▲ Stax Gamma pro/SRD-X pro	583	E The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural	•	•	•	63
▲ Stax Lambda Signature/SRM-T1	1370	E The Signature when combined with the SRM-T1 valve driver must be the most transparent headphone available	Circumaural	•	•	•	72
▲ Stax SR Gamma	219	G+ The next model down the Stax range from the Lambda, the Gamma is an excellent headphone with little to criticise but the price	Circumaural	•	•	•	55
▲ Stax SR Lambda Pro/SRD-7SB	559	G+ An industry reference, frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural	•	•	•	55
▲ Stax SR Lambda Pro/SRM-1	1020	E Extracts layers of information that other headphones only hint at. The SRM-1 has more edge than the SRM-T1	Circumaural	•	•	•	75
Stax SR34	140	G+ The electret driven SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural	•	•	•	55
▲ Stax SR84	210	G+ The stepping stone between dynamics and full electrostatics, these electret phones are revealing, open and highly enjoyable	Supra-aural	•	•	•	63
Technics RP-F3	100	A Robocop styling coupled with a turbo bass switch and an uncomfortable fit, rhythmically OK but no t up to the price	Supra-aural	•	•	•	111
Yamaha YHD-1	46	G Stylish semi-folding design with a slightly forward balance that very nearly scraped a recommendation	Supra-aural	•	•	•	111



Loudspeakers

Last item in the hi-fi chain, to some extent the loudspeaker is merely the slave of what has gone before, capable only of reproducing a signal as good as it is fed. Nevertheless the distortions (colorations and stereo effects) introduced by loudspeakers (and rooms) tend to be more immediately obvious than those anywhere else in the chain, so careful choosing according to taste is very important.

The average loudspeaker consists of a small-

ish enclosure, much of which may have begun life as part of a tree, plus a couple of drive units hidden behind a removable grille. Inside the box lurks a simple electrical circuit known as a crossover, which divides the incoming (full range) signal into the right bits for the drivers to handle. Variations on the above formula are specifically identified in the entries. The designer's primary task is to balance the 'sensitivity' of the loudspeaker (how loud it goes for a given electrical

input) against the bass extension (how low does it go), shown as 'bass from', for the given box size. After that such subtleties as coloration (or lack of it) and dispersion come into the equation.

Careful placement of the loudspeakers within the room is as important as the initial choice of model. See siting columns for guidance. For good stereo they need to be more or less the same distance from nearby walls. Models not ticked as 'floorstanding' will require rigid stands.

Loudspeakers

Product	£Price	Comments	Size: HxWxD (cm)	Site close to wall Bass from (Hz)	Site in free space Sensitivity (dB)	Floorstanding Site close to wall	Issue No.
ATC SCM20	1461	G+ Massively built, invariably informative but the rather forward presentation can be uncomfortable	44x24x31	28	82		• 86
▲ Acoustic Energy Aegis 1	452	G Rich and slightly heavy balance doesn't mask fine mid/treble coherence and transparency. Entry level for all-metal drivers	39x21x26	28	84	•	118
Acoustic Energy AE1	764	G Amongst the best miniatures around, shows exceptional mid focus and coherence, but is pricey and could be more agile.	29.5x18x25	48	84	•	102
▲ Acoustic Energy AE3	1650	G+ Solid, authoritative and impressively accurate – if a shade ponderous and slow	63x26.5x37	23	85	•	86
Acoustic Research Pi 3	219	A Lively good value box has extra bass driver to give plenty of thump, but lacks refinement and extension	51.5x21x23	50	88	•	110
Acoustic Research AR M.5	129	A- Pretty enough but a bit too tiny for its own good, it's better suited to auxiliary surround sound duties	22x16x23	50	88	•	114
▲▲ Acoustic Research AR M1	199	G Cutely shaped miniature delivers splendidly unboxy bass and midrange, but is a little marred by a rather bright treble	27x20x26	30	85	•	110
Acoustic Research AR M2	269	A Not necessarily as agile or well balanced as the cute little M1, M2 is larger, louder and still attractively unboxy	41x24x36	28	89	•	118
▲▲ Allison AL100	100	A Loud and lively budget wall-mount is bigger and beefier than most of the competition, if lacking some subtlety and refinement	33.5x24x21.5	30	87	•	94
Allison AL105	170	A- Pretty enough in appearance, sonically the AL105 doesn't really make the grade at the £150 asking price	37x24x21	45	87	•	78
▲ Allison AL110	220	G- Compact bookshelf model is a little dry and mid forward, but bass is extended and solid	40x24.5x22.5	28	86	•	102
Allison AL120	420	A Pretty well balanced if slightly mid forward, but sound quality is a little disappointing for the price	63x28x27	30	88	•	98
Allison MS 200	220	A- Small and solid as a brick, this micro-miniature has limited bass and bright balance, but sounds agile and communicative	25.5x14.5x15	50	85	•	106
▲ Apogee Caliper Signature	3998	G+ Power hungry full range ribbon panels have remarkable transparency and delicacy, loudness and 'grunt' are a bit lacking	122x70x6.5	30	81	•	81
▲ Arcam Delta Two	340	G Pretty luxury compact sounds a shade forward and coloured but has dynamic and lively bass for its size	37.5x22.5x27.5	40	87	•	94
▲ Audio Note AN-E	1300	G+ Lovely coherence, great midband dynamics and transparency, extended bass and high sensitivity — pity it's so darn ugly!	80x36x28	20	91	•	106
▲ Audio Note AN-J	799	G+ Light damping and local unevenness adds some coloration, but doesn't spoil the very lively, dynamic and coherent sound	58.5x33x24.5	25	90	•	110
▲ Audioplan Kontrapunkt	899	G+ Sounds as sweet as it looks, dressed expensively in real wood with matching stands. not for bass or loudness freaks	31x24x13	48	83	•	86
▲ B&W 2001	120	A Cunningly concealing its (very real) limitations, this is just about the smoothest and best balanced miniature around	29x18x21	48	87	•	118
B&W 610	220	A Bass extension and impressive loudness credentials, but rather indifferent integration and coherence	49x23.5x30	25	89	•	102
▲▲ B&W 620	370	G Has well balanced, laid back and slightly lazy sound that is pleasantly easy on the ears; could do with its own spikes	74x23.5x30	25	89	•	94
▲ B&W DM600	170	A+ An impressively smooth overall balance, but sound is a touch bland with it	35x20.5x25	30	85	•	98
▲ B&W Matrix 801	3495	G+ Lacks the transparency of the best panels, and the drama of the best dynamics, but is something of an acoustic tour de force	77/99x56x43	<20	86	•	81
B&W Matrix 805	845	G Stylish, with remarkable imaging properties, good balance and low coloration, though less successful at musical communication	42x26x22.5	30	87	•	98
▲ Bose 305	390	G- A bit of an oddball, fine dynamic liveliness and a good room match more than make up for the strange stereo imaging and treble	28x45x23	40	88	•	78
Bose 401	456	A Cheaply built but distinctively styled semi-omni floorstander suffers from heavy midbass but still sounds lively and open	78.5x30x28.5	28	89	•	110
Bose 901 MK6	1496	A The pre-equalised multi-driver 901 is cleverly engineered to deliver exceptional loudness	33x54x32	28	89	•	86
Bose Interaudio 3000XL	170	A- Lots of perceived value and well enough balanced, but low cost engineering results in a crude and unsubtle sound	46.5x29x23	45	89	•	71
Boston HD5	130	A Tiny and prettily shaped miniature has an attractive lack of boxiness, but is a little short of drama and dynamic drive	25x16x18.5	30	86	•	110
Brinkmann Endymion	395	A+ Omnidirectional design with rococo styled urn-shaped ceramic enclosure. Distinctly bass light, but impressively coherent	48x29 (diam)	50	85	•	106
▲ Cabasse Bisquine	600	G+ Classy French large bookshelf speaker has great coherence and dynamic grip, but a rather mid-forward overall character	48x26x30.5	30	91	•	110
▲ Canon S-30	150	A+ Clever and unusual moulded design has attractive lively coherence, along with 'wide imaging stereo' effect	27x22.5x23.5	50	88	•	114
▲ Canon S-50	350	A+ Only a small cone miniature at heart, the fascinating styling and extended sweet spot feature make it utterly original.	30x24(diam)	48	84	•	102
▲▲ Castle Chester	650	G+ A brilliant throwback, using horn-type approach to provide startling midrange dynamics and coherence.	94x23x27	45	87	•	98
Castle Durham	250	A Like the slightly larger York, the very pretty presentation is not reflected in a similarly sweet sound	40x22x24	48	88	•	118
▲ Castle Pembroke	400	A+ Comfortably recommended, a sweet smooth sound with good overall balance of engineering-based performance	55x37.5x30.5	46	88	•	31
▲ Castle Trent	169	A This miniature wall-mount sounds lively and engaging, if a bit rough at the top.	33.5x18x20	50	88	•	102
▲ Castle Winchester	1499	G+ Unconventional and beautifully crafted, large for its bass extension but engagingly agile and attractively open and airy	114x24x47	25	87	•	90
Castle York	340	A+ Pretty little real wood compact has an engaging transparency, good balance and fine timing, could do with more authority	43x22x26	30	86	•	110
▲▲ Celestion 1	109	A Pretty basic performance but at a very basic price — it all sounds a bit scrappy and untidy, but its heart's in the right place	27.5x16x21	50	87	•	114
▲ Celestion 15	389	G Big box and bang for your bucks, short on subtlety and control, but long on both enthusiasm and perceived vinyl wood grain	103x20.5x25.5	28	90	•	114
▲ Celestion 3	129	A Good balance and stereo imagery, with a character which leans more towards offensiveness than excitement	31x18.5x21	55	86	•	78
Celestion 5	169	A Cunningly conceived and balanced, the 5 may be a little slow for some tastes, but is well suited to CD-oriented budget systems	35x20.5x26	30	89	•	90
▲ Celestion 6000	1510	G+ A genuine full range audiophile quality speaker system — with Star Wars styling to suit a high tech environment	Two box system	30	82	•	C92
▲ Celestion 7	219	A+ Good looking large bookshelf size wall-mount has lively up front presentation. Can sound a bit coarse, stand is critical	45x24.5x32	30	87	•	98
Celestion 9	269	A Nicely presented and fair material value, with impressively flat bass-to-mid balance	49.5x20.5x24	30	89	•	102
Celestion SL12Si	629	A Elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling	53x20x27	50	85	•	66
Celestion SL600Si	820	G Has certain remarkable qualities that some will find irresistible, but needs careful system and room matching	27x20x23	52	82	•	68
Celestion SL6Si	429	A+ This stereotype luxury compact can sound a bit dull and congested, but really opens up on Slate Audio stands; favours CD	37.5x20x25	30	86	•	94
Celestion 300	1100	G Splendid bass extension and fine panel-like openness and transparency, but dynamics and timing are suspect, balance very laid back.	100x21x31	<20	86	•	118
Creek CLS 10	119	A Almost identical to the Goodmans Maxim 3, this neat miniature is very competently engineered, but not desperately exciting	26x17x21	50	85	•	114

Loudspeakers continued

Product	Price	Comments	Size: HxWxD (cm)	Site Sensitivity (dB)	Site in free space	Floorstanding	Issue No.
Dali 102	230	A Attractive bookshelf model has fine midband focus and bass extension, but treble's a bit restrained and bass a bit detached	37x21x25	30	86	•	114
Dawn Chorus FS	698	G Compact floorstander with superb coherence but rather forward midband. Would suit smaller rooms best	91x26x21	30	86	•	114
▲ Diamond Acoustics Reference III	895	G+ Lovely free stander suffers from indifferent bass alignment, but is fast, coherent, solid and very informative indeed.	87x27.5x28	30	90	•	106
▲ Epos ES11	350	G+ Integral baffle/driver to give a remarkable combination of low coloration, transparency and speed; bass is a bit shy	37.5x20x25	45	86	•	94
▲ Epos ES14	515	G+ Substantial stand mount delivers delightful midrange focus and delicacy with good bass control. System sensitive	49x22.5x29	25	85	•	98
▲ Faraday FS1	225	A+ Concrete box on a budget, works surprisingly well despite cheap drivers, wood veneers here Direct sale only	47x27x28	45	86	•	114
Faraday FS5	589	G Pricey and ugly, but with its own sonic charm, thanks to substantial influence of the concrete enclosure has upon the sound	46x27x26	28	90	•	102
Faraday Siren	330	A- Interesting if ugly high mass concrete cabinet is let down by imbalance of ageing driver combination	46x27x27	48	87	•	94
Genexa SE100	150	A Tandy-stocked miniature is attractively lively, coherent and communicative, could do with more grunt and lower coloration	28x15.5x19	50	84	•	110
▲ Goodmans Maxim 3	110	A Smooth and accomplished wall-mount miniature makes a worthy replacement for the bestselling Maxim 2	26x17x21	50	85	•	106
Harbeth HL Compact	584	A Clean, neutral sound lacks resolution and gives rather unobtrusive though well differentiated stereo.	52x27.2x28.1	65	87	•	59
Harbeth LS3/5A	379	A Still a classic miniature, though not to every taste, and none the better for the recent update under our listening conditions	30.5x19x16	60	81	•	66
▲ Harbeth HL-P3	400	G Very limited loudness but impressive full-range scale from uncoloured and very well balanced but time-smeared sub-miniature	31x19x17	23	82	•	118
Heco Presto Superior 750	650	A Tall slim and attractive floorstander delivers a fine, even in-room balance but lacks transparency, coherence and dynamic drive	95x24x27	22	87	•	106
Heco Reflex 10	160	A Nicely balanced small bookshelf is a competent rather than exceptional package for the price, thanks to indifferent build.	32x21x23	30	90	•	102
▲ Heybrook HB1 S3	250	G Latest version of long established favourite delivers good liveliness and fine coherence for the price	47x29x24	30	88	•	98
▲ Heybrook Prima	120	A+ Neat and discreet miniature delivers fine coherence, pace and timing, though balance is a trifle forward and bass a bit light	29x19.5x18	50	86	•	110
▲ Heybrook Sextet	1079	G+ Engagingly coherent and a highly analytical, partly due to distinct and always comfortable upper-mid forwardness	96x27x20	25	85	•	102
▲ Heybrook Solo	170	A+ Discreetly styled, sounds a little untidy in both bass and treble but handles complex rhythmic material much better than most	36x23x22	28	87	•	90
▲ Heybrook Trio	349	G Same drivers as HBS1 in prettier real wood enclosure give a sweeter and more forgiving if less committed sound	47x24x25	45	89	•	118
Infinity Modulus	795	A+ Carefully conceived and beautifully built. Undeniably attractive in the mid and treble, it failed to handle the bass as well	30x18x26	45	84	•	86
▲ Infinity Reference 10	180	A An engaging and lively sound from a prettily finished and substantial small bookshelf size model	36x23x23	50	87	•	98
Infinity Reference 20	230	A Well presented and balanced with good bass control, but somehow lacks convincing cohesion and agility.	46x27x24	27	88	•	102
▲ Infinity Reference 30	330	G Drivers from Ref 20 in box from Ref 50 creates a well balanced and extended floorstander at a very competitive price	85x26.5x25	25	87	•	106
Infinity Reference 50	550	A- Despite hi-tech drivers, good bass extension and sensitivity, this three-way suffers from a forward, coloured sound	86x26.5x25	25	89	•	98
JBL Control 1 Plus	250	A Sub-miniature with forward midrange and real bass; highish price partly justified by near-indestructible Pro build	23x15.5x14	50	89	•	90
JBL ti1000	1500	G Ultra-engineered, beautifully crafted bookshelf model. Performance compromised by over enthusiastic midbass output from port	44x30x28	45	89	•	118
▲ JPW AP2	180	A Offers real wood veneer at a bargain price; performance is cleaner but broadly comparable to P1 Vinyl overall	43.5x25.5x26	45	86	•	106
▲ JPW AP3	225	A+ Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52x25x29.5	57	90	•	46
▲ JPW Minim	79	A- Very civilised but dynamically limited, the Minim is well suited to the smaller room and where limited loudness is acceptable	27.5x18x19.5	28	85	•	82
▲ JPW P1	155	A+ Honest and basically articulate if not very sophisticated, resolution is good but can sound a little wearing in bright systems	44x25.9x26.1	60	89	•	59
▲ JPW P1 Vinyl	135	A A lot of highly competent loudspeaker for the price, with a safe sound that's unlikely to disappoint	43.5x25.5x26	32	87	•	102
▲ JPW Sonata	115	A+ Well balanced and integrated, offers fine sound if limited bass and dynamic range, plus real tree wood at a nearly silly price	32x23x20	55	86	•	71
JPW Sonata Plus	135	A- This luxury variation on the redoubtable Sonata theme features a metal dome tweeter, and isn't the better for it	32x23x21	30	87	•	90
▲ JRT AD1	500	G+ A fair share of cosmetic deficiencies do little to spoil the impressive coherence and timing	59.5x28x36	28	86	•	86
▲ JRT AD1 Micro	389	G Delightful life and coherence, gives surprising impression of scale; some aggressive tendencies but very open to system tuning	28x17x21	50	87	•	94
Jamo Concert II	330	A- A respectable 'bookshelf' performer that needs free space siting but includes attractive cabinetwork and a neat grille	41x24x25	48	85	•	66
Jamo Concert V	500	A Compact, solid, nicely finished delivers unusually extended bass at the expense of lowish sensitivity; midband is laid back.	86x24x28	20	85	•	102
Jamo Concert VII	800	A Beautifully built, uses unusual double reflex bass system, unsuccessfully as far as low frequency resolution is concerned	96x28x31.5	25	87	•	94
▲ Jamo Cornet 50	150	A+ Good value bookshelf size speaker has a rough and ready sound but good heart, engaging liveliness and fair timing	42x23x22.5	28	87	•	110
Jamo Silhouette	400	A+ Tall, slim and rather elegant in its way, doesn't sound bad for a styling exercise, just a bit rich and polite	122x24.7x17	45	88	•	114
▲ Jordan JH400	504	A+ Piano finish hexagon has single full range driver and controversial sound, with uneven balance but delightful mid coherence	33x24x30.5	50	83	•	106
KEF 101/2	549	G- Small high class wall-mount has a beautifully even, slightly dull balance, fine freedom from boxiness, but not much bass drive	33x26.5x26	50	86	•	114
▲ KEF 104/2	1495	G+ A reference point for dynamics, preferred without KUBE, suited to many rooms. Good stereo, high sound level	90x28x41.5	50	92	•	60
KEF K120	169	A Physically pretty and sonically competent but undistinguished bookshelf size model has good sensitivity but limited extension	34x20.5x26	45	87	•	106
▲ KEF Q80	549	A+ Uni-Q floorstander has good stereo and fine midband coherence, but bass lacks extension, drive and resolution	85x24.5x26.5	45	87	•	106
KEF Q90	700	A Generous floorstander has even balance and decent extension but fails to communicate excitement and involvement effectively	90x25x32	25	88	•	118

Connections



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Loudspeakers continued

Product	Price	Comments	Size: HxWxD (cm)	Site in free space	Sensitivity (dB)	Floorstanding	Issue No.
Kammerzell Ref Mini Monitor	545	G A beguilingly sweet sound with good pace and drive, but scale is restricted and presence a little dulled considering the price	27x17x24	50	85	•	94
▲ Kenwood LS-770E	260	G Impressively communicative bookshelf model has fine vigour, scale and dynamics, if not the smoothest sound around	48x27x25	25	89	•	106
▲ Kenwood LS-500G	500	G Japanese designed and built luxury compact delivers an invigorating and exciting sound; an interesting contrast to some lazier models	45x23x26	48	89	•	118
▲ Linn Index II/KuStone	374	G Stand and speaker looks and sounds very good, good bass extension and control, fine dynamic range. Clean, clear if a shade slow	44x21x23.5	28	86	•	90
▲ Linn Kaber	1198	G+ Dry, bright balance emphasises superb dynamic range and transient precision, but can sound unforgiving	89x19x29	25	85	•	118
Linn Kan II	530	A+ Niche product for those prepared to tolerate its strong character for the sake of fine bass performance and near invisibility	30.5x18.5x16.5	35	82	•	78
▲ Linn Keilidh	579	G+ Stunning timing and coherence and awesome bass drive, especially with ceramic plinth; sounds a bit shut in	83x20x27.5	22	87	•	114
▲ Mordaunt-Short 5.40	299	G Elegant near-floorstander has an even balance that makes it very easy on the ears, yet also inviting and informative	64x21.5x26.5	28	85	•	110
▲ Magneplanar MG1.4	1090	G+ Offers a very crisp and articulate sound, particularly revealing of upper mid vocal details	155x8x57	40	88	•	72
Magneplanar SMGa	688	A Tonally 'rich', in the right room it proved a satisfactory musical experience	122x48x4.5	56	85	•	46
Marantz DS110	200	A+ Pretty near-miniature trades bass extension for sensitivity, delivering fine midband dynamics but little grunt	33x19.5x20.5	55	88	•	114
▲ Martin Logan CLS II	4200	G+ High resolution design, fussy about system set-up, demanding of ancillaries and software alike. It rewards the efforts though	60x28x7.5	45	86	•	72
Meridian Argent 1	995	G+ Beautifully built, finished and shaped, has fine bass extension and virtual absence of 'boxiness'; needs a big amplifier	33x27x27	28	83	•	98
Meridian Argent 2	875	G Beautiful high-tech 'large compact' delivers extended, smooth and neutral sound with fair speed. Slate Audio stands essential	48.5x21x29.5	23	85	•	94
Meridian M30	950	A Pricey active speaker, easy on the ears and worth considering especially where space is at a premium	38.5x18x32	40	NA	•	46
▲ Mission 753	700	G+ Gorgeous presentation and potential for open transparency. Floorstander with lots of drivers that gives lots of loudness	90x22x30.5	45	88	•	114
▲ Mission 760i	130	A+ Attractive little wall-mount miniature has livelier dynamics and bass drive than most of its type, but sounds as little shut in	29.5x18x20	48	87	•	110
Mission 761i	180	A 760 theme adds an extra driver for easier amp loading and power handling. Slightly inferior to simpler, cheaper 760i	38x19x24	48	88	•	102
Mission 764i	480	A Generous and handsome floorstander looks fine material value for money, but good scale sound has lazy tendencies	89x25x32	22	86	•	118
Mission 765i	680	A+ Big heavyweight floorstander has good sensitivity and bandwidth, but somehow lacks agility, authority and dynamic grip	102x25x33	22	91	•	110
▲ Mission Cyrus 780	200	A+ Pretty miniature based on Mission 760 but with beefed up box and crossover network to enhance sound quality still further	29x18x26	50	88	•	90
▲ Mission Cyrus 781	250	G Properly run in, the pretty little 781 delivers a fast, dynamic and informative sound which more than justifies its price.	43x22.5x28	28	88	•	86
Monitor Audio MA1800	1350	A+ Even when ballasted with lead shot the 1800 inclines towards upper bass richness and lacks genuine extension	106x22x32	30	88	•	81
Monitor Audio MA700 Gold	400	A Luxury compact does a good job of voice reproduction, but sounds a bit lazy and off the tempo with faster, busier material	35x21.5x25	50	85	•	110
Monitor Audio MA800	600	G Beautifully finished compact has a delightfully even and uncolored midband transparency, sensitivity and bandwidth are limited	51.5x20x27.5	45	85	•	114
▲ Monitor Audio Monitor 11	330	G Tall, slim and attractive compact has an extra driver to help out in the bass, giving extra urge at some price in delicacy	52x20x24	48	87	•	94
Monitor Audio Monitor 14	400	A Suffers from excess upper bass, giving a thick, chesty coloration beneath a quite lively and well focused mid and treble	78x20x24	30	86	•	98
Monitor Audio Monitor 7	180	A Lively and punchy, looks pretty enough and is good value but is let down by an unruly and indifferently integrated tweeter	34x16.5x17	70	84	•	74
Monitor Audio Monitor 9	210	A Despite a much better treble balance than the 7, the 9 is less engaging and lively at low frequencies than its smaller sibling	37x20x21	30	85	•	78
▲ Monitor Audio Monitor One	150	A+ Pricey but cute micro-miniature just about gets away with it sonically, though performance envelope is inevitably limited	24x15x16	55	85	•	106
Monitor Audio Studio 10	1200	A+ All-metal driver diaphragms provide engagingly transparent midrange and treble, spoiled by over-strong mid-bass.	40x20x25	45	87	•	90
▲ Monitor Audio Studio 15	1600	G A little slow and lazy but better balanced than the smaller Studio models, the midband coherence and focus is superb	51x20x26	45	87	•	102
Monitor Audio Studio 5	650	A+ All metal diaphragm luxury miniature has splendid presence coherence but sound can be aggressive and lacks welly.	32x18x20	28	83	•	98
Monitor Audio Studio 6	800	A+ Pretty but pricey metal diaphragm compact has clear and transparent midband but is ultimately lacking in vim, vigour and drive.	35x22x25	45	86	•	118
Mordaunt-Short 5.10	130	A Plenty of well engineered speaker for the money, and smoother than most of the competition, but lacks timing and enthusiasm	30.5x18.5x21.5	50	85	•	110
Mordaunt-Short 5.20	150	A Lots of speaker for your money, but not as smooth or well balanced as other M-S 5-series models	36x21.5x21.5	45	87	•	114
Mordaunt-Short 5.30	220	A- Good hi-tech material value for money, but a disappointingly dull and rather bland sound. Safe but uninspiring.	42.5x25x28	28	86	•	106
Mordaunt-Short Classic 20	395	A+ Luxuriously finished, beguiling mid transparency, bass is altogether less convincing	37x22x27	45	86	•	102
Morel Bassmaster 602	1200	G+ Superbly built compact stand-mount, did well in listening tests but suffers (enjoys?) upper midband peak	24.5x40x22.5	25	84	•	114
Musical Fidelity MC-3	400	A+ Solid and authoritative large bookshelf model gives fine stereo and decent dynamic drive but balance is rather shut in	47x26x28	25	88	•	118
▲ NVA Cube 1	720	G+ Attractive, semi-omni is very sturdily built, and gives an idiosyncratic but unusually open, spacious and informative sound	33x32x32	52	85	•	71
▲ NVA Cube 2	480	G A rude but exciting miniature, with unusually accomplished bass capabilities for its size	28.5x27x28.5	48	85	•	82
NVA Cubix	1400	G Too idiosyncratic for recommendation, the Cubix possesses remarkable bass extension for its size, but is tricky to optimise	60x32.5x32.5	28	84	•	78
Naim NA IBL	823	G This tiny floorstanding wall mount delivers outstanding dynamics, speed and detail, marred by pronounced upper mid forwardness	80x18x15-20	30	84	•	94
▲ Naim SBL	1584	G+ Impressive scale, full bandwidth, coherent, attractively discrete, coloured midband, very well balanced and agile	88x26.5x17-27	25	86	•	102
▲ Neat Petite	525	G+ Far from perfect, but one of the most entertaining and enjoyable speakers around, colorations notwithstanding.	30.5x20x18	33	86	•	102
Nobis DM7	560	G Pretty US bookshelf model has more than enough speed, timing and coherence to make up for a measure of coloration	38x21.5x28.5	25	85	•	110
Origin Live OL1	499	G Luxury miniature has very good overall balance, sacrificing sensitivity to achieve remarkable bass extension for the box size	30.5x19x21	25	82	•	106
Philips FB820	470	A Big-but-less-than-beautiful three-way is well enough balanced but lacks communication skills in the time domain	86x27x35	28	87	•	98
▲ Philips FB825	700	G Generous sounding and impressively uncongested, loudness and bass extension don't quite match plasticky looks	110x29x41	25	88	•	90
▲ Pro Mon Co LB1	998	G+ Delightful smoothness and transparency, though bass extension and sensitivity are both limited	53.5x18x26	33	86	•	110
Professional Monitor Co AB1	1600	G Bulky stand-mount transmission line has lovely panel-like transparency, slightly shut in balance, and needs a big room	79x27x43	22	89	•	114
QLN Model One	700	A Model One exaggerates the Signature's rich and heavy midbass and lacks its velvet smoothness	35x25x27	28	85	•	82
QLN Signature	1100	G Luxury compact has a rather laid back and 'heavy' sound, but coloration is low and stereo imaging very good	37x18x36	30	83	•	78
▲ Quad ESL-63	2384	G+ This classic electrostatic may not be punchy in the bass, but has strengths that some can't live without	92x66x27	34	84	•	60
▲ Rega ELA	405	G Very compact floorstander with integral stand has serious coherence and dynamics, but a measure of brightness and untidiness	84.5x20x30	30	86	•	110
▲ Rega Kyte	198	G Has splendid timing and coherence, sounds very explicit and informative, if a bit bright and short of grunt	31x19x20	50	87	•	114
Richard Allan CD5	176	A- Neatly presented small reflex design can sound engagingly communicative, but is flawed sonically and technically	38x19x23	80	88	•	68
▲ Rogers LS2a/2	220	G Balance is a bit warm and rich but 2a/2 has delightful mid-to-treble coherence and transparency, and more welly than Mk1	35.5x23x22	30	84	•	106
Rogers LS4a/2	300	A+ Civilised but a trifle lazy, this large bookshelf model hasn't quite the timing or agility to be particularly engrossing	43x25.5x25.5	25	86	•	110
Rogers LS6a/2	350	G Largish stand-mount is well built, measures well, good material value, but sounds a bit heavy and lacklustre	51x28x29.5	22	87	•	114

TO READ THE FULL REVIEW, ORDER THE APPROPRIATE BACK ISSUE ON PAGE 92

Loudspeakers continued

Product	£Price	Comments	Size: HxWxD (cm)	Site Sensitivity (dB)	Site in free space	Floorstanding	Issue No.
Rogers LS8a	450	A+ A mixed bag, with plenty of scale and welly but lacking the subtlety, clarity and agility delivered by some rivals	89x25.5x25	48	91	•	102
▲ Rogers Studio 3	450	G Pricey LS3/5A-derived wall-mount-sub-miniature is excitingly coherent if a bit lightweight; no real loudness capabilities	31x19x17	30	83	•	118
▲ Rogers Studio 1a	599	G- Classic BBC monitor sound sensitively updated – transparent and natural with fine stereo, but a touch 'heavy' in balance	63.5x30.5x30.5	36	87	•	66
▲ Roksan Darius	1895	G+ Provides an exceptionally impressive combination of transparency and delicacy with fine information retrieval and speed	47x27x40	20	82	•	86
Royd Topaz	173	A+ Cheerful, articulate and essentially communicative miniature can also sound a trifle scrappy and shut in; well worth trying	30.5x20.5x19	50	87	•	114
Royd Abbot	666	A+ Engaging and dramatic dynamics and fine transient coherence are hampered by a rather coloured mid-forward balance	83x20x34	43	88	•	118
Ruark Swordsman Plus	299	A Real wood variation on the Swordsman theme looks and measures rather better than it sounds	38x20x28	27	84	•	98
▲ Ruark Talisman 2	700	G Less ideologically committed than some compact floorstanding rivals, its key strength lies in fine all round compromise	86x25x31	30	86	•	118
SD Acoustics Ribbon	2295	G+ Amplifier sensitive, Ribbon is a lively and loud hybrid marred by some colorations; some like it, others don't	152x30x(15-30)	30	91	•	81
▲ SD Acoustics SD1	1650	G+ A large scale, airy and unusually detailed system with excellent dynamics. A warmer balance than original model	123.5x38.2x32	50	90	•	60
▲ SD Acoustics SD3	399	G Port firmly blocked, the new SD3 has the agility and charm of a quality miniature, with good bass extension but low sensitivity	38x19.5x29	25	83	•	106
SD Acoustics SD4	699	G Tall slim floorstander has fine balance, good bass extension and lovely open midband transparency	100.5x20x30.5	25	85	•	114
Sequence 30	200	A Radical slimline hang-it-on-the-wall design has performance comparable to a typical miniature, with reasonable overall balance	87x25x7	50	85	•	114
Shahinian Arc	1062	G Unusual and occasionally wonderful small floorstanding omni; too bright but exceptionally coherent and revealing	69x35x25	24	85	•	110
Snell JIII	770	G Dated styling belied by fine sensitivity and bass extension, and a lively if slightly untidy and not quite coherent sound	58x33x25	30	89	•	118
▲ Sony APM-101ES	120	A Big hearted sound from small bookshelf model, sounds a little untidy at frequency extremes, so suits CD better than vinyl	39.5x22.5x23.5	52	86	•	71
Sony APM-121ES	170	A- Good perceived value, but balance has an artificial 'loudness', too rich in the bass and too strong in the treble	43x25x28	25	86	•	86
Sony APM-181ES	350	A Big, beefy, fat and bass heavy, has table strengths but lacks transparency and sounds better at lower levels	57.5x29x36	40	87	•	71
▲ Spendor S20	535	G Maintains Spendor's tradition for peerless mid-to-treble coherence and perspectives. Bass is rather unconvincing.	38x22x26	25	83	•	102
Spica Angelus	1295	A A little bass shy and soft in the bass and lower mid, otherwise tidy, extremely lively and fluid, if uneven overall	116.8x53.3x26	50	86	•	60
Spica TC50	599	G This triangular-profile 'grown up' miniature is a shade boxy and laid back but has good rhythmic and musical integrity	40.5x33x29	55	88	•	71
Spica TC50SE	799	G A heavily UK-modified TC50, the SE sounds less boxy and more spacious, but lacks some of the urgency of the standard model	40.5x33x29	55	88	•	71
▲ TDL Monitor	1999	G+ Fine solidity and good accuracy, with great bass extension. Needs a big room and can sound a bit lazy and a shade tinkly	118.5x30x47	28	85	•	66
TDL Studio 0.5	450	G Tiny floorstanding transmission line has good agility but doesn't provide the coherence or even balance of Studio 1	55x20x30	40	85	•	94
▲ TDL Studio 1	650	G Genuinely extended bass from a compact enclosure, very detailed but a shade clinical and detached in presentation	76x23x33	25	84	•	78
▲ TDL Studio 1M	900	G+ Transmission line helps bring the best from metal cone driver: lovely transparency and fine bass extension	81x23x33	<20	84	•	118
▲ Tannoy 603	125	A+ Pretty hexagonal cabinet delivers fine imaging with little boxiness, but little in the way of welly and power either.	33.5x22x16	45	85	•	102
▲ Tannoy 605	160	A+ Largish bookshelf size hexagon is potentially fine performer, though unusual stand sensitivity makes optimisation difficult	40x27.5x18	25	85	•	106
Tannoy 605LE	189	G Mass-loaded audiophile variation of 605 sounds lively, with decent weight and timing	40x27.5x18	30	87	•	114
▲▲ Tannoy 607	200	A+ Modest and pretty hexagonal box helps give fine bass and mid performance, but treble is rather shut in	50x32x23	25	88	•	118
▲▲ Tannoy 609	270	G Hexagonal cabinet and dual concentric driver is sweeter than its predecessors, making this one very superior speaker	50x32x22	25	90	•	102
Tannoy 611	399	A This compact floorstander would seem to have plenty going for it, but somehow failed to gel musically	72x32x24	25	92	•	110
▲ Tannoy Westminster	6000	G+ These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge	38	96	•	Col
Technics SB-EX2	180	A Nicely presented, well built and decent size enclosure sounds solid but somewhat dull	48x23.5x27	20	86	•	98
▲ Technics SB-RX50	650	A+ A smooth and well balanced loudspeaker, its minor weakness being a mildly excessive low bass	48x30x26	40	86	•	46
▲ Thiel SCS	1069	G Luxury piano-gloss compact sets class-leading standards for coherence and communication, can sound a shade dark and shut in	40x22x23	45	87	•	114
Thiel CS1.2	1219	G Elegant compact floorstander has fine balance and dynamic range, but transient timing and dynamics are less convincing	94x27x27	30	86	•	118
Vandersteen Model One	1395	G+ This compact American floorstander's elegant staggered baffle arrangement contributes to a refreshing freedom from boxiness	100x30.7x25.6	23	87	•	86
Visonik David 6001	173	P Sharp styling but the complex grillework worsens a sound which starts off with too much top and not enough bottom	20x12x13	130	87	•	74
▲ Wharfedale 425	200	A+ Large bookshelf size 505 heir shows fine control and a conservative balance ideally suited to quality systems on a budget	40x27x26	45	87	•	118
▲ Wharfedale 515	260	G An update on the 505 theme, this is still more evenhanded, with better bass extension and smoother treble.	40x25.5x30	28	85	•	106
Wharfedale 517	400	A Half as big again as the 515, should offer an improvement, but somehow has a less effective overall subjective balance	53x26.5x34	25	86	•	110
▲▲ Wharfedale Delta 30.2	100	A Has a bigger main driver than many, and so packs a bit more welly and loudness. Coloration is rather obvious, but timing is good	38x22x17	48	88	•	98
Wharfedale Diamond V	130	A This miniature is smoother than most, but rather stodgy with it, inspiring little enthusiasm among our listeners	27x18x20	50	86	•	114
▲ Yamaha NS 1000M	1100	G+ Living up to its monitor label, and tonally well suited to digital material, it's superbly crafted and capable of high levels	67.5x37.5x32.5	40	90	•	46
▲ Zyp A1	199	A+ Cute metal cased micro-miniature is quite coloured but great fun, with surprising dynamics and fine wall-loaded room balance	22.5x14.5x13	30	85	•	110

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and kick ass!

Tuners

The radio medium operates at a much lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live Prom concerts can rival all other sources from a hi-fi perspective.

Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen ampli-

er cosmetically. However, the task they carry out is far from simple, combining the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on local reception conditions, but money invested in a high quality outside aerial system is well spent.

Tuners come in two basic types. Analogue models tune gradually (and usually manually) across the bands, and can have analogue or digi-

tal displays; they are often preferred for sound quality, and are certainly best for AM bands. Digital tuners offer convenient automatic tune facilities and pre-set memories.

The 'Presets' column heading shows how many different frequencies a tuner can memorise for instant access. FM, LW and MW show which wavebands it can access. 'Signal strength meters' are useful for aerial alignment. 'Automatic tuning' means that a tuner can seek out signals for you.

Tuners

Product	£Price	Comments	Presets	FM	LW	MW	Signal strength meter	Automatic tuning	Manual tuning	Issue No.
Aiwa XT-003	110	A- Economically designed and built in the UK, but trade-offs have a marked influence on FM and AM sound quality.	30	•	•	•	•	•	•	93
▲ Akai AT-93L	280	G+ By AM standards presentable (good) while FM delivers the goods	20	•	•	•	•	•	•	65
▲ Arcam Alpha 2	185	A+ Arcam's cheapest tuner makes up for its lack of features with a sensitive front-end and mellow sound.		•		•		•		93
Aura TU-50	260	G Tonally neutral, but with rather poor imaging and a certain woodenness to the sound.	16	•				•		109
Creek T40S3	250	A Analogue tuner. Sample was hampered by an obvious bass 'hump', production units are said to be cured		•				•		93
▲ Denon TU-260L	120	G+ Bare minimum of features. Careful designwork promises a surprisingly open and vivacious sound, so don't overlook it!	20	•		•		•	•	93
▲ Denon TU-660L	200	G Not so successful under 'ideal' conditions, made a fair fist of real reception if a little muddled and lacking life.	30	•	•	•		•	•	108
Harman Kardon TU9200	200	A The listening panel appreciated its liveliness, but found it a little muddled.	32	•		•		•	•	109
▲ Harman Kardon TU9400	270	G+ Striking in appearance and with a sound to match, it comfortably exceeded our expectations. On stereo FM it's HK's best yet.	24	•		•		•	•	93
Harman Kardon TU9600	380	G Good bass and detail, and good - perhaps slightly enhanced dynamics	24	•		•		•	•	109
▲ Magnum Dynalab FT101	795	G+ Although expensive for its fairly minimum set of facilities, its excellent sound makes up for what it lacks elsewhere		•				•	•	72
▲ Marantz ST-40L	120	G Slow to tune but provides a meaty and dynamic sound on FM. AM too has a little extra bite to its performance	30	•	•	•		•	•	93
Meridian 204	660	G Pleasant sounding with a fine finish but does not make the grade at this price		•					•	55
▲ Naim NAT 01	1425	E There may be better sounding tuners in the world, but we have yet to hear one		•				•		50
Nakamichi ST-7E	765	G+ Exceptionally good for weak-signal areas, and good all round	16	•	•	•		•	•	55
▲ Pioneer F-676	200	VG A tuner that's detailed and clean-sounding. Perhaps a little bright, but not unpleasant.	36	•		•		•	•	108
▲ Quad FM4	424	G+ Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7	•				•	•	50
▲ Rotel RT-930AX	160	G- A competent rather than exciting performer, with low audible interference though slightly compressed and muddled sound.	20	•	•	•			•	108
Sony ST-S570ES	230	A A host of features, but the sound is muddled, compressed and lacking in frequency extremes.	30	•	•	•		•	•	109
▲ Technics ST-G70L	200	G+ Another very polite and refined-sounding tuner but one that does retain just enough sparkle to keep your interest. Plenty of widgets	39	•		•		•	•	93
▲ Yamaha TX-950	260	G+ Very clean and civilised, tonal balance, detail and clarity are all very good, lots of useful features	40	•		•		•	•	108

Turntables – cartridges

Cartridges fall into two groups: high output models, capable of working directly into most amplifiers and categorised as having a normal (N) output, and more expensive low and very low output models (L, VL). Stereotypically, low output cartridges use the moving coil principle of operation, have better mechanical integrity and tighter tolerances, and

give better performance but at much higher cost. With CD now the dominant medium many amplifiers are no longer equipped with the necessary phono input for a cartridge and a separate phono stage is necessary. Valve designs need either an extra head amp or transformer to cope with the low output of moving coil cartridges.

Cartridge/amplifier interfacing can be very

subtle, but even basic high output MM designs benefit in overall balance from optimised amplifier capacitance loading. The mechanical characteristic of cantilever compliance ('springiness') needs to be considered in the light of the effective mass of the tonearm, and to achieve a good match compare the effective mass requirements figures with the actual effective mass of specific tonearms

Turntables – cartridges

Product	£Price	Comments	Arm effective mass (g)	Output	MM	MC	Issue No.
▲▲ Arcam C77	30	A+ A sensible moving magnet package with good bounce at a competitive price	6-16	N	•		48
▲▲ Arcam C77Mg	40	A Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8	N	•		67
▲ Arcam E77Mg	60	A Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8	N	•		48
▲ Arcam P77Mg	73	A+ Preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9	N	•		48
▲ Audio Note IO IIV	1395	E One of the best, giving 'an extraordinarily relaxing midrange clarity', needs a transformer	8-18	VL		•	100
▲ Audio-Technica ART1	850	VG This is a delicate and very fluid-sounding MC that tracks well, offers very low distortion and exceptionally good separation	9-18	L		•	72
▲ Audio-Technica AT-420E	36	A Better suited to pop recordings, this MM bears some of the sonic hallmarks of the Linn K5	7-14	N	•		67
▲▲ Audio-Technica AT-95E	20	A Clear, dynamic if richly balanced, the magnetic '95E is a definite Best Buy	8-14	N	•		48
▲ Audio-Technica OC-10	320	G+ Good treble and good detail too, but some congestion and coloration reduces its informativeness.	4-12	L		•	103
▲ Audio-Technica OC-5	130	G For the price, it's unusually effortless and detailed, but it tends to become rather relentless and tiring after a while.	5-14	L		•	103
Audioquest AQ 404i-L	500	G+ Slight harshness detracted from the performance of this otherwise clear-sounding and detailed cartridge	8-16	L		•	84

Protect your sources . . .

We find that preamplifiers are often the weak point in people's systems. When you consider that signals of just a very few millivolts are being switched and adjusted it is hardly surprising if those signals get mangled. It is the point in the system where all the emotion, space and musicality from the performance can all too easily slip away. There is a crucial interplay between sources – especially vinyl – and the preamp, and it is vital to consider these early stages of the system all together. In our opinion the answer is most definitely *not* just to do away with the preamp in favour of a passive stage. The sound may be pure but it usually lacks drive and is very vulnerable without the active buffer circuits. Our preference is for valve preamps every time, for the realism, atmosphere and space they bring, and they work beautifully with CD sources and solid state power amps.

Lumley Three versions – line, phono and Signature – of this superb preamp are now available. Naturally they complement the **Lumley** valve power amps, producing a stunning combination to challenge the established best at any price.

Concordant This range of line and phono preamps frequently crops up in magazine recommendations for readers' systems because they run quiet and cool and sound excellent.

CAT The best in the world probably still has to be this beauty from the US – once heard, its magic is never forgotten.

Free system assessments and home demonstrations anywhere in the West Country and Wales. Try new items in your own system before you buy.

Agencies: sources: Orelle CD, Transfiguration, Basis, Magnum Dynalab tuners; **amps:** CAT, Concordant, Lumley, MAS, Michell; **speakers:** Diamond Acoustics, NEAT, Pentachord, Alon; **cables:** Cogan Hall, Silver Sounds, Sonic Link; **supports:** Mana Acoustics, Seismic Sink.

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E-180GX-BLK-PK10... £25.00	C-90 Audio PK10..... £4.50	D-90-PK10..... £8.50	EHG-180-PK10..... £29.00
E-240GX-BLK-PK10... £34.00	JVC	D-60-PK10..... £7.00	HI-FI E-180-PK10..... £37.50
E-180HGX-BLK-PK10. £34.00	E-180SX-PK10..... £21.00	SF-60-PK10..... £10.50	EHG-240-PK10..... £32.50
E-240HGX-BLK-PK10. £40.00	E-240SX-PK10..... £27.00	SF-90-PK10..... £12.50	SE-180-PK10..... £66.00
S VHS	MAXELL Audio	SA-60-PK10..... £12.50	SE-240-PK10..... £82.00
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Turntables – cartridges continued

Product	£Price	Comments	Arm effective mass (g)	Output	MM	MC	Issue No.
Audioquest AQ 7000	1300	G+ Stunning stereo imaging and good detail at low levels are spoiled by less-than-perfect tracking and high sensitivity to arms.	6-20	L		•	91
Audioquest MC5	250	A Offers high-output benefits but the drooping frequency response and severe VTA error preclude recommendation	10-20	N		•	54
Denon DL103	99	A+ Good performance in bass and general 'life' is seriously let down by its spherical stylus which kills subtle details.	9-22	L		•	103
▲ Denon DL110	69	G Firmly recommended as a fine all-rounder, this high-output MC model is likely to perform well in nearly all circumstances	6-16	N		•	48
Denon DL160	90	G Although listeners just preferred the 110, its brother here proved a twin in lab tests and is still "thoroughly competent"	6-16	N		•	43
▲ Denon DL304	200	VG Uncolored, detailed, neutral, superb tracking; top notch altogether, and a top notch bargain too.	4-12	L		•	103
▲ Dynavector 17D2	298	VG Clear, detailed, neutral and generally very informative - excellent	6-18	L		•	91
▲ Dynavector DV-50X	110	A A high-output MC model with impressive lab performance, but whose tip and sound quality both disappointed	6-14	N		•	48
▲ Dynavector DV10X IV	138	A+ Fine sounding and realistically priced, damping is recommended to ensure successful tracking ability	8-18	N		•	48
Dynavector XX-1	698	G+ Good, but not immensely competitive at the price, and not helped by comparison with the low output version	7-15	N		•	84
▲ Dynavector XX-1L	698	VG Very clear, very detailed, no troubles with tracking; response lift around 20kHz seems to do no harm	7-13	L		•	84
Empire Benz Micro MC-Gold	150	G Nothing is obviously wrong, but nothing is stunningly right either. Safe, but perhaps a little too safe	7-17	L		•	103
▲ Empire Benz Micro MC-Silver	150	G Ultimately not the peer of the MC Gold is more appropriate to the sort of equipment it's likely to be partnered with	8-18	N		•	103
▲ Empire Benz-Micro MC-3	800	G+ Offers a warmer and very transparent account of the music. Its tracking prowess is slightly limited	5-12	L		•	72
Glanz GMC-10LX	80	A+ Bearing some of the hallmarks of the '10EH, the '10LX is still less competitive in the sonic stakes	7-15	L		•	67
▲ Glanz GMC-20E	129	G+ Very good tracking, smooth sound and good detail. Very slight surface noise enhancement	5-10	L		•	91
▲ Goldring 1012	50	G Slightly harsh sound but plenty of life and quite good detail. Some very high frequency coloration apparent	6-12	N	•		85
▲ Goldring 1022	70	G As with 1012, a touch harsh; detail and transient purity improved, though, and it goes well with electric guitar!	5-11	N	•		85
Goldring 1042	90	G Not terribly subtle, and not such good value alongside 1012 and 1022. Quite lively, though	7-12	N	•		91
▲ Goldring Elan	20	A A lightweight and frisky-sounding MM that appears to be based upon the same body as the Nagaoka mm4	7-15	N	•		67
Goldring Elite	200	G The basics are right, and it will cheerfully tackle any source material, but its sound possesses a certain dirtiness	8-18	L		•	103
▲ Goldring Epic II	30	A+ An excellent budget choice though the limitations of the stylus are rather obvious at higher frequencies	5-12	N	•		67
Goldring Eroica H	100	G- More confused and coloured than low-output LX, high output less of an issue these days	8-15	N		•	84
▲ Goldring Eroica LX	100	G Not the most subtle cartridge in the world; can sound edgy at times, but lively and informative	8-14	L		•	84
Goldring Excel	549	G Errs on the warm and heavy side of neutral. Strong bass lines are its forte, but resolution of subtle treble details is weak	6-13	L		•	72
Goldring Excel GS	600	G+ True high end quality in its lack of colorations, but tracking seems indifferent and high levels tend to sound rough and edgy.	9-20	L		•	103
▲ Grado ZTE +1	27	A Bass and treble are a trifle coloured but the midband proved highly enjoyable. Ideal for budget systems	6-13	N	•		54
Kiseki Blackheart	1995	G Demonstrated refined poise and a delicate but at once potent security, however, the price did seem a little on the high side	6-16	L		•	60
Kiseki Blue Goldspot	499	G+ Good bass and imaging, but hints of spit and coloration let the side down slightly	8-15	L		•	84
Kiseki Lapis Lazuli	5000	G+ Combining very sensible design concepts at a silly price, combines the detail of the MC3000 and the fluidity of the Clearaudios	4-12	L		•	60
Kiseki Purpleheart Sapphire	899	G+ Rare, beautiful to look at and sweet to listen to, our review of this high-flyer conjured up images of Japanese art	5-14	L		•	48
▲ Linn K5	49	A+ Not as crisply focused as the costlier Linn magnetics, the K5 offers a smoother presentation	7-16	N	•		67
▲ Linn K9	98	G Linn threw this model into the leading pack by beefing up the Basik's bodywork and adding a super stylus	6-15	N	•		Col
London Maroon	199	A+ Now manufactured under the London brand name this Decca cartridge is as iconoclastic as ever	9-20	N	•		67
London Super Gold	339	A- Immediate and detailed, but very coloured, very nonlinear and questionable effect on records. Devotees swear by it	9-15	N	•		84
▲ Militek Aurora	299	G+ An overall feeling of relaxed ease characterised this clear and atmospheric Kiseki-built cartridge	8-16	N		•	Col
▲ Militek Olympia	349	G+ Warm and detailed sound packs the punch of the best MCs with high output as a bonus	12-20	N		•	54
▲ Nagaoka MM4	9	A- Clear punchy sound that delivers the rudiments of a good performance	6-16	N	•		54
▲ Nagaoka MP10	19	A High frequencies sounded "shut-in" with this spherical-stylus model, but mid and mass were energetic, bouncy and punchy	5-13	N	•		48
▲ Ortofon 510	30	G+ For the price, a good blend of virtues weight, clarity and neutrality	3-11	N	•		85
▲ Ortofon 520	50	A+ Very sensitive to load capacitance this new Ortofon maintains the company tradition for a lively, effervescent SQ	7-16	N	•		67
▲ Ortofon 530	80	G+ Very clean and assured sound; transients not quite perfectly pure but plenty of detail.	4-11	N	•		85
Ortofon 540	100	A Graced with FGII stylus but possessed of too high a compliance for broad arm matching. It could also sound a little unforgiving	3-8	N	•		67
▲ Ortofon MC10 Super	80	G "What a delightfully sweet-sounding cartridge this is . . ." we said	5-15	L		•	48
▲ Ortofon MC15 Super	100	G+ A good all-rounder, with outstanding performance in detail retrieval, even if it can be very slightly bright and close-up	10-24	L		•	103
▲ Ortofon MC3 Turbo	110	G Not terribly subtle, but it obviously doesn't aim at that. The 3 Turbo is bright, cheerful and bouncy - take it as it comes!	10-24	N		•	103
▲ Ortofon MC3000 MkII	900	E Low levels of body resonance are a real ear-opener. Nothing to criticise elsewhere; one of the very best	9-16	VL		•	84
Ortofon MC5000	1500	G Review sample could not be fully run-in, limited tracking ability, bright and forward sound, though imaging is excellent	12-20	VL		•	91
▲ Ortofon Quartz	140	G Lively, quite detailed, and a touch bright, the Quartz has many qualities of the much dearer Quasar	3-12	L		•	91
▲ Ortofon Quasar	350	G+ Many of the qualities of the MC3000, although a touch bright. Good detail and delicacy	8-15	L		•	84
Ortofon Quattro	210	G+ Undoubtedly a competent performer. Generally neutral, but can be edgy and bright in loud passages	6-18	L		•	103
Rega Bias	34	A+ Difficult to mount in some arms due to its shallow build, the bias offers a gentle, refined SQ	4-10	N	•		67
▲ Rega Elys	74	G Clearly superior to the Bias, despite their common heritage, the Elys is both more detailed, accurate and musically convincing	8-15	N	•		67
▲ Revolver	20	A This modified AT-95E enjoys a very lively mid and treble even if the bass is somewhat 'slower' in comparison. A firm budget buy	8-16	N	•		67
▲ Roksan Corus Black	130	G Recognisably related to Corus Blue, but distinctly more civilised and smoother.	7-12	N	•		91
Roksan Corus Blue	75	G Roksan-specified modified Goldring 1012; slight harshness detracts from otherwise good sound.	7-12	N	•		91
Shure M110HE	67	A Sound quality was thought eminently presentable, but not exciting; smooth clear high frequencies, but a loss of bass definition	5-10	N	•		38
Shure M92E	20	A Though lacking depth, the overall sound quality was competent, but treble was not its forte	10-15	N	•		43
▲ Shure ME97HE	55	A+ It won't turn a sow's ear of a turntable into a silk purse, but will at least keep going and produce an acceptable result	8-20	N	•		48
Shure V15 VMR	220	A+ Initial listening gave promising results, but extended familiarity gave the feeling of a lack of energy and a "shut-in" sound	5-12	N	•		38
▲ van den Hul MC One	849	G+ This extended all the positive qualities of the '10 but added greater authority and scale worth it for the extra money	6-12	L		•	60
van den Hul MC One Super	949	G+ Slight softening on transients was the only real flaw, but it didn't quite seem to have that special touch one expects	8-15	L		•	84
▲ van den Hul MC Two	1099	G+ Connected directly to any standard MM input it rewards with a highly detailed yet fluid and musically convincing portrayal	6-13	N		•	72
▲ van den Hul MC10	699	G+ A neutral balanced performer giving transparent midrange, fine depth and focus with firm extended bass. Gosh!	5-10	L		•	60
▲ van den Hul MM1	250	G+ If woody midrange coloration could be tamed, the excellent imaging and admirable security would make it excellent	7-15	L		•	103

All along the Watchtower . . .

I don't often write about software in this column, partly because so much of it is such a depressing experience. And there's no avoiding the unpalatable fact that the hi-fi industry is almost totally dependent upon a music business which frankly, my dears, doesn't give a damn about anything except the accountant's bottom line.

For more than twenty years the music listening classes have been rediscovering the virtues of simplification, whether through the removal of tone controls and other fripperies from an amplifier signal path or retroversion to the simplicities of valve circuitry.



The *Cirkus* comes to town for Paul Messenger, who also discovers the joys of legal Bob Dylan bootlegs.

During the last thirty years, however, the music business has wholeheartedly embraced every upward twist of the technological spiral.

However much you talk up the sound quality advances from multi-track recording via noise reduction and equalisation to all the latest digital domain trickery, there's no avoiding the fact that most, if not all, have negative implications for the actual musical values of the performance. And as one of our correspondents recently pointed out, one of the upshots of my wonderful state of the art hi-fi system is the ability to hear all too clearly the technical

excrement of the recording and broadcast processes.

So what prompted this tirade? A record which was released some time last year, and whose main claim to fame is that it was recorded largely without the questionable virtues of mixing desks and recording studios. I've written in the past about the delightful music available to concertgoers who slip a Sony *ProWalkman* into a shoplifter's overcoat. It's often spoilt by the state of the PA system, and the whole palaver is certainly enough aggravation to take the edge of the enjoyment of the event itself, but the end result has a superb realism that few other sources can match.

Now you no longer have to roll your own bootleg tapes. The same experience is now available pre-packaged by the music biz, for Bob Dylan fans at any rate. *The Bootleg Series volumes 1-3 (rare & unreleased) 1961-1991* could have had a snappier title and may be one of the more sonically inconsistent box sets ever released, but the truly ear-opening high spots are

alone well worth the fairly modest price — I paid £28.49 for what turned out to be a five LP set of some sixty tracks.

But the sublime irony is that the true sonic highlights are not so much the bootlegged live recordings but some very early studio out-takes and demos from the early Sixties, prior to the wholesale techno-takeover. Check out *Moonshiner* from 1963 on side three and then ask yourself (or CBS Sony) why they don't make 'em like that anymore. Then compare this depressing thirty year perspective with what television has accomplished over the same period (cf those grubby *Ready, Steady, Go!* repeats from the same period) and it's hardly surprising that the music business is getting squashed between modern AV media and *The Supersonic Hedgehog Bros.*

The *Cirkus* act — synergy or straitjacket?

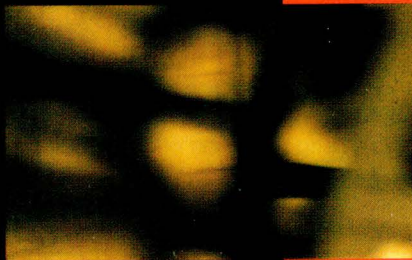
The Linn *LP12 Cirkus* update reviewed in this month's *Sessions* provided another disturbingly powerful example of the vital importance of inter-component synergy when putting together a system. Using Linn amplifiers, the improvement wrought by this modification was dramatic and enormous, leaving my other Naim oriented and as yet un*Cirkum*cised Linn sounding distinctly insubstantial and woolly. Changing over to Naim amplification, however, shifted the perspective quite alarmingly, putting the Naim style *Sondek* firmly back into the frame.

That's not particularly surprising, but I'm beginning to realise it's also an unavoidable consequence of any specialist hi-fi manufacturer which makes a full system. At its most simplistic there's an element of balance compensation: Naim's *DBL* loudspeaker is several dB relatively lighter in the bass than Linn's active *Keltik* speaker, so it's logical that Naim's amplifiers should have the richer, heavier balance, and Linn's the comparatively dry bass end.

But it goes much further than that. There's an inevitable determinism at work that makes it increasingly difficult to break out of the complete system straitjacket as products become increasingly refined, simply because the whole process of refinement takes place within the context of whatever system the manufacturer makes.

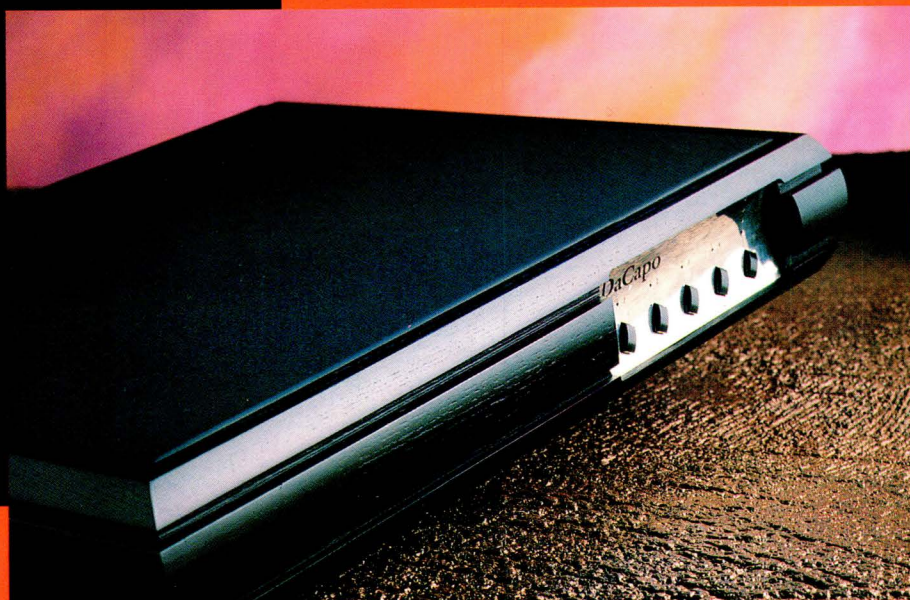
I could just as easily have used companies like Mission or Meridian as examples, but have chosen Linn and Naim because I'm pretty familiar with their current products, and also because the classic circa 1975-1985 Linn/Naim system used to be a common heritage, and it's intriguing to see the degree to which each is now steering a separate and divergent course. And it's not hard to predict we'll see a similar pattern of development in the thermionic sector of UK audiophilia now that Audio Innovations and Audio Note are going their separate ways.

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