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THE WORLD'S No. 1 GUIDE TO BUYING HI-FI
HI-FI CHOICE
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MENU

Mixing the right ingredients of hi-fi separates to form a successful system is more an art than a science. If you've ever heard an unpretentious system made up of 'affordable' components blowing the socks off a much more expensive system, for example – maybe at a hi-fi exhibition – you'll know that sometimes a system can be greater than the sum of its parts. We call this 'system synergy' or 'supercompatibility'. To enjoy good sound at home you don't *have* to spend a fortune on hi-fi gear, but you do need to choose components which work well together.

For this month's *Choice* we've assembled a selection of systems, at prices to suit most pockets, to see how they fare. To say that we picked the products out of a hat would be a little simplistic – though, to be fair, not too far from the truth. However, they are systems which look pretty tasty on paper, and with so many different brands and models to choose from on the High Street many of you could end up with systems not too dissimilar. Alvin Gold has been listening to them – and, as you will see, some of the combinations worked out better than others.

There are no specific Recommendations and Best Buys this month, because each system 'review' is more a story about getting the best performance from hi-fi separates than a critical assessment. The moral of the story (stories?), of course, is that buying hi-fi piecemeal is a hit-and-miss affair, which is fine for hobbyists who enjoy swapping and experimenting with various components but not so good if all you want to do is buy a hi-fi system and get on with the business of enjoying listening to it. Consequently the importance of employing the services of an experienced specialist hi-fi dealer can't be overemphasised.

This month we've got two free gifts for you. SKC is offering *Choice* readers a 90 minute chrome cassette tape (turn to page 27), and if you've an unidentifiable cable jungle behind your hi-fi then this month's free cover gift should put matters right. Label your connectors and cables with these self-adhesive identification tags and make rear-viewing easy.

Also this month we've been checking out a selection of 'yuppie blasters' – upmarket portables most of which incorporate CD players. Mind-boggling fact: the market for portable radio/cassette recorders in Japan is 6.4 million units – that's this year alone! It's predicted that 3.8m of these will include CD players.

Amplifiers are our prime target in next month's *Choice*. September's issue also includes the second in our series of *100 Choice Cuts* free supplements. This time around it's a collector's guide to some of the greatest jazz recordings of all time. Plus there's a free tape from Maxell. Don't miss it!

John Bamford



Cover photograph by
Chris Richardson.

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Alvin tries out ten different combinations for *Choice's* first look at separates combinations.

YUPPIE BLASTERS

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CHOOSING AND USING YUPPIE BLASTERS

Get rid of the ghetto with these digital portables; Jason Kennedy sets the scene.

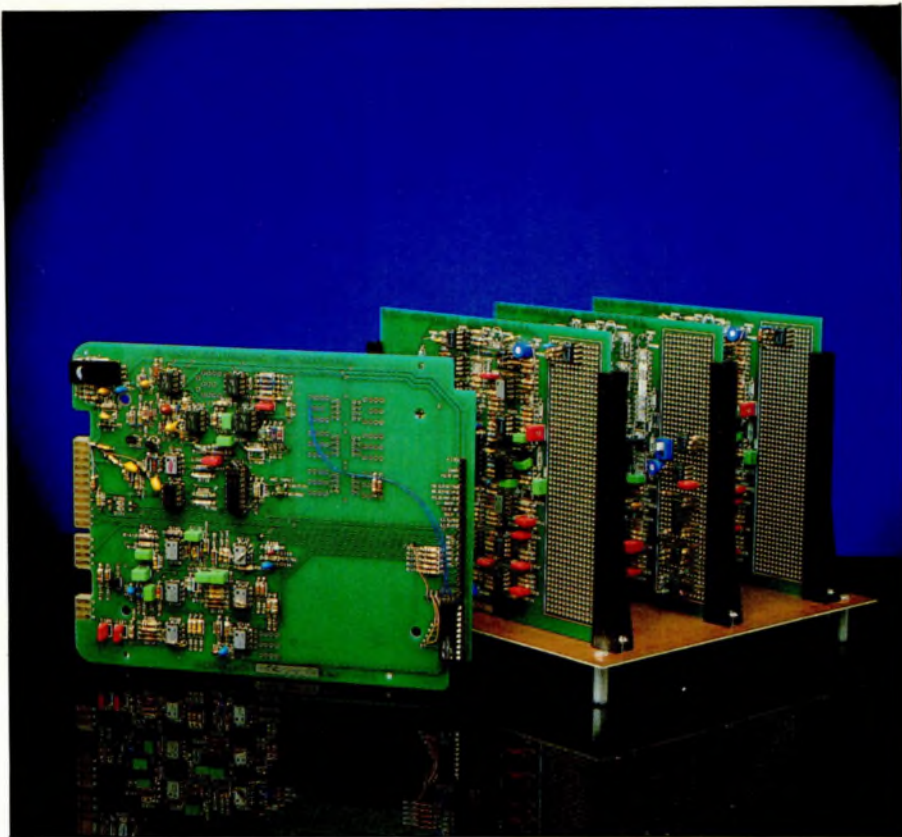
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YUPPIE BLASTER REVIEWS

Jason muses on the merits of ten machines.

Top left, bottles glow in one of our tested separates systems; and above a Cyrus Two/PSX resprayed for the Paris hi-fi show; below, this year's model blaster from Philips.





On the horizon, a new Dolby system destined for our cassette decks (above, left); a classic recorder is lovingly restored (above); and below, Soundstream provides the current in an aspirational in-car installation.

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THE CHOICE DIRECTORY

Our unique buying guide packed with information and comment on all the currently available equipment and accessories we've reviewed.

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COMING UP

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CHOICE OFFERS

Discounts on High Street prices with a range of DMP audiophile jazz compact discs, and state of the art WBT accessories.

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PERSONAL MESSAGES

Paul Messenger rounds off the magazine with his personal message on the Spondor *S100* loudspeakers.

FREE TAPES

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SKC AUDIO CASSETTE

Turn to this page for 90 minutes' free listening. SKC *QC90* chrome tapes up for grabs!

And don't miss next month's issue which will include a tape from Maxell.



SALE BARGAINS

Look out for sale and coupon prices, for the best genuine hi-fi bargains around.



AUGUST NEWS

SUMMER SIZZLERS
This month sees us offering some sizzling hot 32° goodies, donning dark shades, straw hats and bright polka-dot boxers... There's more news too, BARCAD have just awarded our good selves "Hi-fi dealer of the year award" for the 11th successive year. The fact that no one else belongs to BARCAD (The British Association of Ridiculously Cheap Audio Dealers) is completely irrelevant. This again means that any thoughts you had of visiting a conventional hi-fi dealer you must forget immediately and.... come on down.

HI-FI DEMOCRACY
Our policy review board have strongly recommended the abolition of nuclear weapons in favour of cheap hi-fi for all. Should Mr. Richer become Prime Minister at the next election. He promises 1. No VAT on Hi-fi separates bought from selected centres nationwide 2. The banning of audio retailers whose name doesn't begin with the letter 'R' and 3. Immediate knightings for all his mates.....

God help us.
DEALS GALORE
We would be making a serious omission if we didn't tell you we had the most unbelievable deals on an enormous range of Hi-fi separates, however immodest that may sound. Take for instance the Kenwood DPM97R remote control multiplex compact disc player at only £149.95, Ariston FR 'Q' Decks at only £99.95 (high quality ortofon cartridge at only £10 extra), and NAD speakers at only £69.95 per pair. Just a microscopic selection from our vast range.

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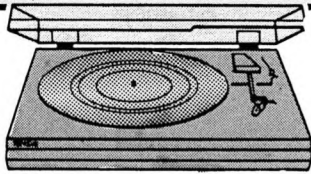
ONLY £9.99 For items up to £100
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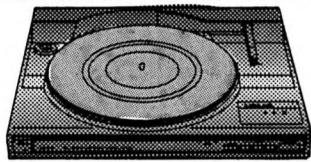
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Turntables



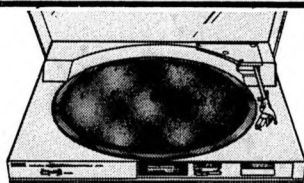
TENSAT T3705 Add this super slimline semi-automatic turntable to your system. Features include tone-arm lift-lower, 33 & 45 RPM speeds and a clear acrylic cover. Cart £5 extra.

**COUPON PRICE
£29.95**



FISHER MT685 Trendy, touch-control linear tracking fully automatic belt-drive turntable currently on offer at less than half its normal price! Cart £5 extra.

**COUPON PRICE
£39.95**



Cart £5 extra.

YAMAHA F39 An impressive 'economy' version of Yamaha's traditionally up-market turntables. Semi-automatic, DC motor, what more could you want?

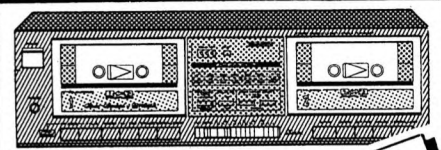
**AMAZING PRICE
£49.95**



JVC ALA151 One of this month's superdeals, this smart low-profile, semi-auto turntable certainly performs and now at a super-low price. Cart £5 extra.

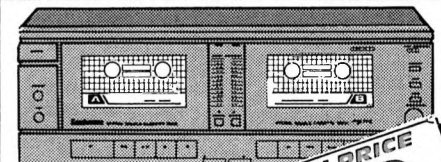
**AMAZING PRICE
£59.95**

Cass Decks



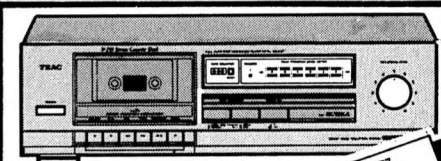
FISHER CRW35 This unbeatable value separate has all the bits for half the price! Twin cassette, touch controls and Dolby* NR. D.C. Voltage.

**SALE PRICE
£49.95**
WAS £69.95



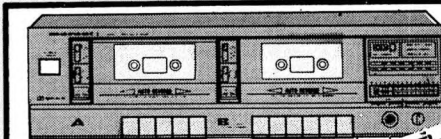
GOODMANS MRW2001 At this price it must be stolen! No bulk-buying's the answer on this fantastic twin with high-speed & synchro dubbing.

**COUPON PRICE
£59.95**
WAS £89.95



TEAC V255 Here's one that'll have you die-hard enthusiasts reaching for your cheque books! Specs include Dolby* B NR & touch controls.

**SALE PRICE
£69.95**
WAS £89.95



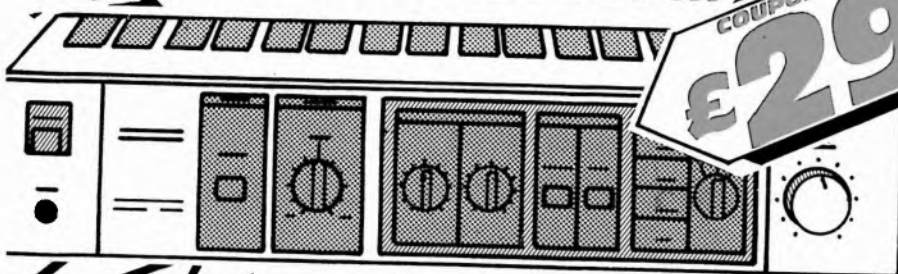
MARANTZ SD285 From a quality name comes a very tempting twin. Delights include Dolby* B&C NR, super metal alloy heads and soft touch controls!!

**COUPON PRICE
£79.95**
WAS £129.95

FACTORY REPACK

SALES DEALS...

AMAZING AMPLIFIER SCOOP...



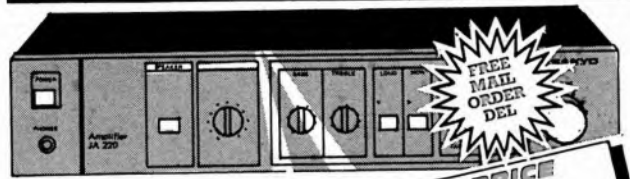
COUPON PRICE
£29.95

SANYO JA220 Our Sanyo superdeal gives you more quality and more watts per pound than any other 'budget' amplifier - 20w RMS per channel, in fact, and plenty of inputs for your turntable, cassette deck, tuner or CD player. Plus separate bass & treble controls and 'brushed silver' finish. A bargain buy at any volume!

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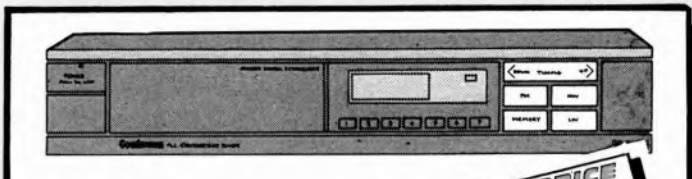
Amplifiers



FREE MAIL ORDER DEL
SALE PRICE
£49.95
WAS £50.95

SANYO JA240 Make me the centre of your attention! I've got lots of inputs, bass and treble controls. (fairly) slim waistline and an output of 25wpc. My figure? 420x80x220!

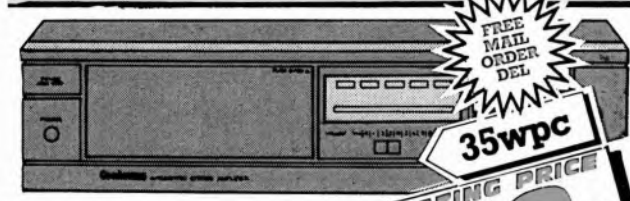
Tuners



AMAZING PRICE
£49.95

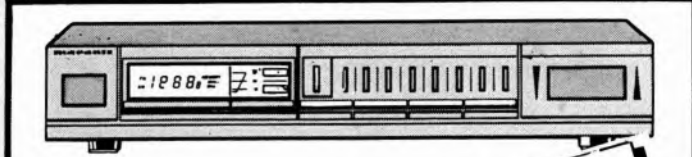
GOODMANS MDT2001 Digital dynamite! Our budget priced best-buy synthesiser tuner boasts a high-luminance digital display, 14 touch presets and 3 wavebands!

You can get some amazing bargains - What Hi-fi? magazine.



FREE MAIL ORDER DEL
35wpc
AMAZING PRICE
£59.95

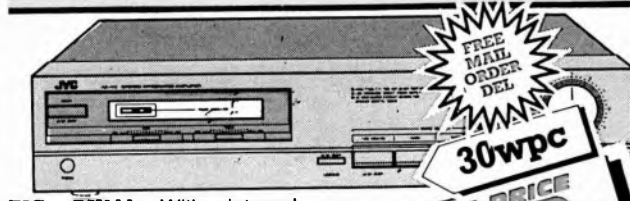
GOODMANS MPA2001 35 watts of music power! Featuring high filter switching and mic mix this 6-input amp is amazing value at our potty price!!



SALE PRICE
£79.95
WAS £80.95

MARANTZ ST26 We've an unbelievable price on this sensational superdeal: Touch presets, search tuning, and of course Marantz's impressive name for high spec reliability.

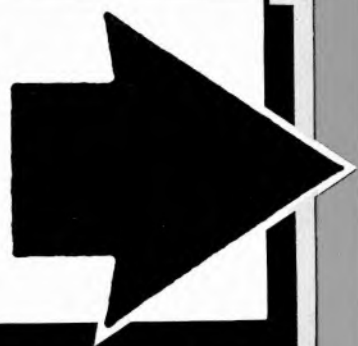
Richer's no nonsense pile-it-high sell-it-cheap approach is hard to beat.
Dave Attwood - City Limits Magazine



FREE MAIL ORDER DEL
30wpc
SALE PRICE
£69.95
WAS £70.95

JVC AX111 With internal 30wpc twin-amp high fidelity configuration and a low impedance direct power supply this smartly presented integrated amplifier is a real gem.

BARGAINS CONTINUED ON PAGE 12...



WE GUARANTEE TO BE THE CHEAPEST!

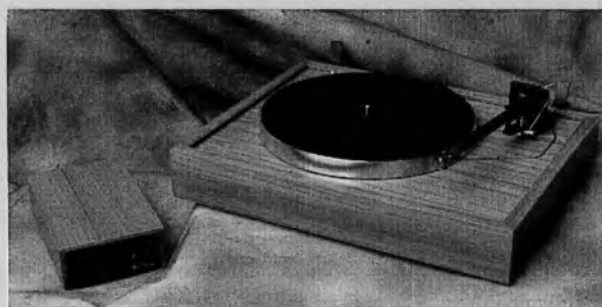
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Musical Fidelity	Yamaha
Mordaunt Short	Zeta
Marantz	

ROKSAN XERXES



*The Reference Xerxes,
Artimez & Shiraz on
Permanent Demonstration*

SONY



Dealer Award

'87

WINNER



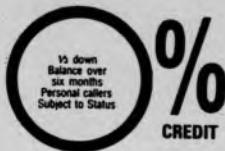
Dealer Awards

1988

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UPDATE

PRODUCTS

LISTEN SONY

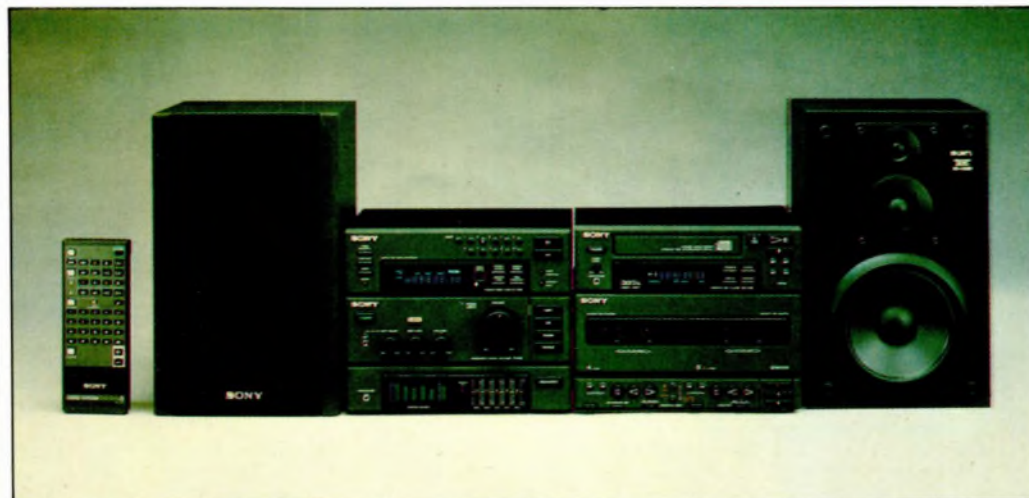
The British outpost of the Sony Empire recently unveiled its 1989 range of products which includes 65 separates. Some 200 products, from a solar powered *Walkman* to the £5,000 twin-box *CDP-R1* CD player make up the range which contains VCRs, TVs and video cameras.

In response to market research which shows an upward trend towards buying separates hi-fi (as opposed to midi systems or music centres) Sony UK will be doubling its range to offer 65 separate components over the summer of '89. These include five loudspeaker models, four amplifiers, two CD players, four cassette decks, two tuners and a turntable "to meet demand" in the *ES* range. For instance, the four amplifiers are offered ranging in price from just under £250 to £450. Other models make up the *Basic* range which includes the likes of £50 or £70 loudspeakers aimed at customers who want to upgrade their midi-systems, say.

Sony's task is to corner at least ten per cent of the market with each of its separates component categories, so models in every price bracket have been developed; the company claims a 13 per cent share in the overall audio market.

Covering every step up in price is also the philosophy behind the range of 11 midi-systems which start with two non-CD models and finish with an all-singing and dancing AV compatible £1,500 creation with enough flashing lights to shame Blackpool and a whole lexicon of features.

Sony is also launching a new line-up of three natty mini-systems with soft lines and a grey suede-feel finish which Nick Hopewell-Smith, Sony's PR man, claimed would sell as a main hi-fi system for the home. "People with stylish interiors really like these, they're very unobtrusive; you could feature one in *Aspirations*," said Nick hopefully while stroking the fascia of the £649 *MHC3300CD* mini-system.



Sony's mini 3300 system: a per-sueding finish?

TANNOY'S UPGRADE

Loudspeaker maker Tannoy has introduced changes and an addition to its range of dual concentric models. The *DC1000* and *DC2000* have been joined by the *DC3000*, a floor-standing unit costing £600. *DC3000* is bi-wirable and uses two eight-inch drivers, one of which is a high sensitivity dual concentric cone. The braced enclosure uses a novel slotted port system and can

be mass loaded for stability. The model is hard wired using van den Hul cable and is available in real wood veneer finish at £600 for black ash or £699 for rosewood. Tannoy's other models in this range – the £200 *DC1000* and £300 *DC2000* – have been upgraded to give improved sound quality at no extra cost. These now feature gold-plated terminals, improved cabinet bracing and 'printed instructions' for bi-wiring.

Pass me some more of this stuff: Tannoy's loudspeakers in surrealistic pose.



MORE BASS FROM LITTLE BOXES

Amplifier and loudspeaker matching has been taken a step further by Yamaha's new Active Servo Technology (AST). The system uses a cartridge that plugs into the amplifier, and which defines the characteristics of the AST speaker in use.

AST only operates below 200Hz and is in effect a means of increasing the low frequency extension of a loudspeaker without increasing cabinet or driver size. This is achieved by the use of a 'negative impedance convertor', 'active servo positive feedback' and dynamic compensation' (impressive huh?). In practice this means that the feedback loop is extended right out to the driver giving the amplifier greater control over it.

Sonically the AST system does seem to extend the LF response of small boxes to a greater extent than usual, it also improves imaging which in the demonstration was quite impressive.

Inevitably both the amplifier and loudspeaker have to be AST models produced by Yamaha and the starting price is around £700 complete.

One spin off of this technology is the *Astarte* Series; rather attractive grey midi systems with unusual and stylish loudspeakers. These cost around £600.

INFINITY ADDS SIX

Stateside loudspeaker manufacturer Infinity has launched its new RS range of transducers in Britain. Six models, priced from £119 for the bookshelf RS1001 to £749 for the floorstanding RS6001, make up the range which is available in light or black 'oak' finish. Features include a curved front face with floating grilles 'to reduce diffraction' and use of IMG (injection moulded graphite – specially developed for the series) bass cones. Polyspherite, a material described by Infinity as 'far exceeding the performance of plastic or metal', has been used for the midrange and tweeters. Internally the range uses Monster Cable. All models are said to have an efficiency rating of 89dB.

QED'S MINIS

QED has developed a range of three mini amplifiers to cater for microphones, analogue inputs and headphones. The stylishly designed stereo modules are all priced at £49.95 but will need their own 12 – 24 volt outboard power supply.

The microphone amplifier has been designed for use with cassette decks without mic inputs. It can be switched in or out of the circuit. The headphone amplifier is aimed at 'discerning audiophiles' to be connected to the main amplifier or preamplifier to avoid any loss in sound quality.

The RIAA phono preamp unit is useful for systems without



Six of the best: Infinity hopes to beat the competition with its RS series.

analogue inputs where a vinyl source is required. A switch again allows the unit to be bypassed. QED is also excited about a new 'conventional' amplifier planned for the early autumn but could not be drawn to release any details... watch this space.

CAN'T SEE THE CD?

A labelling service is being offered to help music lovers tidy up their CD collections by inserting clear, easy-to-read cards of artist/album in the spine of jewel cases. Labels cost 15 pence each and there is a minimum order of ten (price includes postage). Contact BCP, 33a Shepherds Green Road, Erdington, Birmingham. Tel: (021) 350 2193.



CD storage made easy.

SUPER MIMIC

At 100kg Goldmund suggests its new *Mimesis 9* stereo power amplifier could be the heaviest in the world; maybe the firm hasn't heard of the 110kg Musical Fidelity SA470s! Nevertheless a heavyweight, in terms of engineering as well as mass, the 9 has been developed especially for low efficiency loudspeakers and offers "ultra fast circuitry" with a claimed rating of 1MHz at 200W.

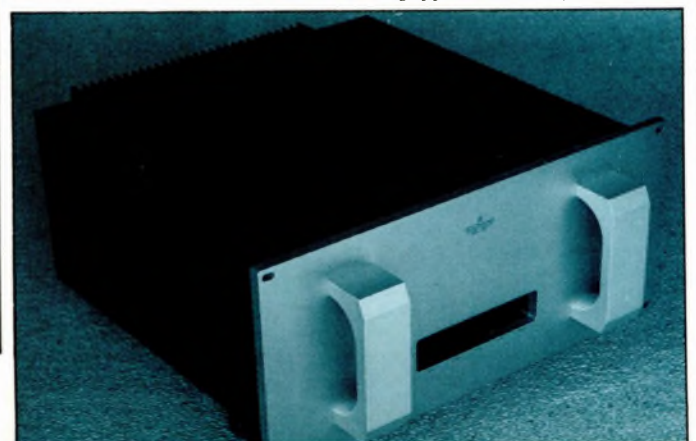
Goldmund says the amplifier therefore gives higher dynamics and transparency than other high powered amps which 'tend to be

slower and less accurate'. Much thought has gone into the chassis and 6mm steel case construction to isolate circuitry from sources of vibration and interference. The case itself is decoupled from the three conical feet and circuitry by Teflon isolators. The amp is also described as very safe with protection against oscillation, preamplifier DC offset, overheating and short circuiting, but in view of the weight, claims about 'easy manipulation' seem a little ambiguous. Absolute Sounds intends to distribute *Mimesis 9* at around £6,800.

QED mini amplifiers: they're small.



Goldmund's Mimesis 9: heavier than 100kg cf feathers? Well, no.





The Numbers game continues – Technics S1-P777 uses MASH '1-bit' (or 3.5-bit) digital to analogue convertor.

TECHNOLOGY

TECHNICS SEMINAR

National Panasonic traditionally holds a European Press seminar once a year to introduce up-and-coming Technics products and discuss present and future technology. This year's venue was the coastal town of Helsingor, north of Copenhagen, where some 50 or more journalists representing hi-fi magazines from throughout Europe were gathered to see what Technics has in store for us this season.

Expect to see a whole host of new CD players, amplifiers, cassette decks, and some new loudspeakers in the coming months – many of them no doubt featured in *Choice* review projects in future issues.

Meanwhile the major topic for discussion this year was Technics' MASH digital convertor system, which is already featured in some existing CD players though, believe it or not, Technics hasn't been telling anybody for fear of confusing consumers. MASH stands for Multiple Stage Noise Shaping, a development of NTT (Nippon Telegraph & Telephone Corporation) LSI Research Laboratories. Technics is calling its new MN6471 DAC chip a 1-bit convertor (though to be strictly accurate it's a 3.5-bit system) and claims much improved reproduction of low-level signals.

In terms of marketing the MASH system, Technics has a point. After all, having spent the last five years telling consumers that 16 bits are better than 14, that 18 are better than 16, and that a 20-bit D-to-A conversion system approaches audio nirvana, how exactly does one explain that in fact a 1-bit (or 3.5-bit) system is even better still?

When questioned on what's happening with DAT, all Technics would tell us was that there was plenty of work going on 'behind the scenes'. "DAT is important for future markets – almost too important... we've got to get it right," and "the market isn't ready for it yet" all imply that DAT isn't being written off as a non-starter, far from it. Technics also claims to be working on optical recording systems (recordable CD) but said it was not ready to make an announcement. As for research into the effects of different coating materials for CDs, research which Technics said it would be undertaking two years ago, we were told there was no clear evidence so far that different materials had any bearing on sound quality or longevity.

The Technics brand was originally designed as the high fidelity arm of Panasonic. You don't see the Technics badge on television sets or video recorders, for example. However, one theme which constantly came to the forefront of this year's Press Seminar was the impending integration of audio and video in home entertainment systems. When criticised for having allowed other manufacturers to steal the lead in digital sound processing, for example, Technics claimed to be researching heavily into DSP systems. "We want to concentrate on room acoustics and have 'digital soundfield processing' integrated with A/V systems", we were told. Technics is actively promoting worldwide standards for DSP and A/V systems. It would like to see agreements set up for simple wiring and digital bus lines to be common throughout the industry.

YOUNG TURKISH TAPE

Of what possible interest is Europe's trendiest holiday destination to a bunch of hi-fi and video journalists? Our host for a press trip to Turkey was a new (to the UK) brand of tape called RAKS. And unlikely though it may sound, it's manufactured from start to finish – tape coating processes, chemistry and all – in a plant just outside Turkey's third city, Izmir, on the Adriatic coast.

The visit was the key ingredient in plugging any possible credibility gap – which it succeeded in doing very well. In fact RAKS began production more than a decade ago, but has hitherto concentrated on its nearer European neighbours. Respectable market penetrations of ten per cent in Greece, nine per cent in Italy and six per cent in France and Germany are bandied about, and now it's the UK's turn.

Given that the EEC is currently messing around with the tape market by slapping anti-dumping levies on all manner of low cost Far Eastern output, and given that Turkey is a low wage economy which has already applied for EEC membership, RAKS would be very well placed even without a credible product.

RAKS has the necessary high level of technical competence to manufacture magnetic tape, alongside a refreshing and hungry attitude to economic and technical success that is a far cry from the UK's Turkish stereotype. The determination to match or beat world standards was evident throughout the assembly and quality control sections, all subject to stringent anti-dust measures, and the company seems firmly grounded

in the engineering fundamentals necessary to produce a consistent product.

RAKS is just a symptom of a society that is rapidly becoming consumer electronics literate, Muslim adherence notwithstanding. Within a couple of hundred yards of the hotel I found literally hundreds of tiny electronic component shops. ICs and components of all shapes and sizes cluttered the windows and shelves of several arcades and back streets, interspersed with plumbing and automotive supplies.

The scene was distinctly reminiscent of the Tottenham Court Road of the '50s, or Tokyo's Akihabara in the '60s. All of which is pretty strong evidence that Turkey is developing the infrastructure that could make it an increasingly important producer as well as consumer of electronic products during the next decade.

One key factor is that the country straddles East and West geographically and culturally. Modern transportation may have shrunk the globe and made the old trade routes redundant, but current cultural and political contexts could well place Turkey firmly back on the economic stage soon, provided the social structure can cope with the currently severe stresses of rapid growth and high inflation.

THINK OF A SPEAKER

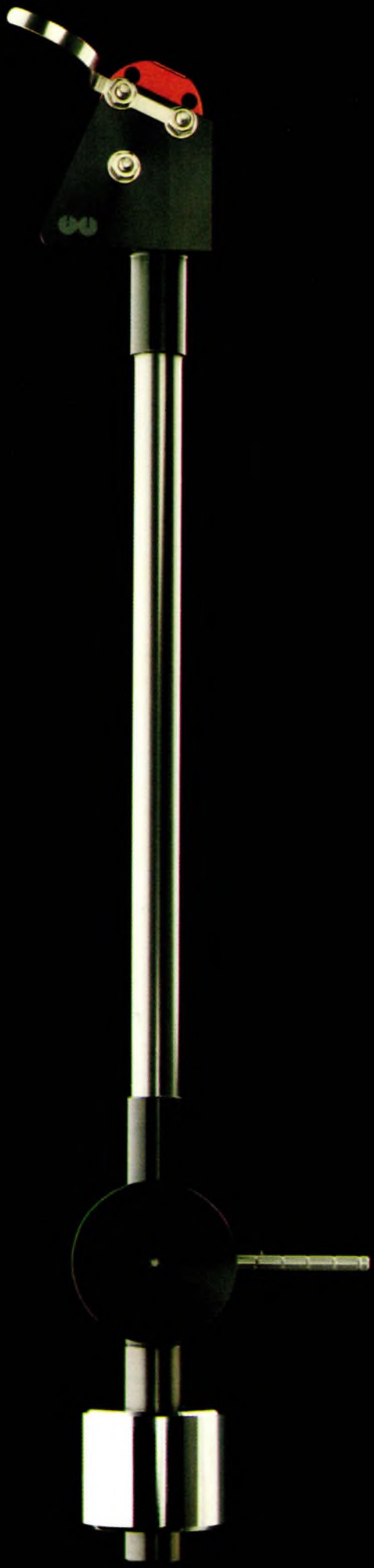
Yamaha's new AST system allows relatively low bass to be created from small enclosures (see this month's product news), and this has inspired the company to launch a loudspeaker design competition. Creativity rather than technical expertise is what Yamaha is looking for.

For further information contact Yamaha on (0923) 33166.

BUSINESS

LE SET II

Le Set, the audio/video store for yuppies has spawned a brother. The latest Le Set has put down its roots in the newly refurbished Whiteleys of Bayswater, a fabulous ex-department store that has been turned into a shopping Mall. The new Le Set will be selling a similar range to the Brompton Cross branch – a seductive array of gadgets and hi-fi from B&O, Sony, Quad, Nakamichi etc, and there's even a Le Set amp which is custom made by Sugden. On the TV side Le Set offers Custom Colours, a range of unusual finishes for your goggle box.



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AND THE SHOW GOES ON . . .

Paris in the spring is an ideal setting for the hi-fi show *Journees de la Haute Fidelite*, originally a high-end spin-off from the main *Festival du Son* but now a major exhibition in its own right. Superbly organised at two hotels, with courtesy coaches running every few minutes between them, the Paris show is a most civilised event, with many manufacturers showing style and verve in their exhibition rooms.

British hi-fi was a little thin on the ground. However the folk from Roksan were spotted driving stacked *Hotcakes* (!), Audio Innovations was showing its first *Series 400* integrated amplifier which certainly looked the part in a new-style case, and DNM was exhibiting with the idiosyncratic Rehdeko loudspeaker brand. French distributor JLB Monitor Systems was flying the British flag with products from Pink Triangle, Rogers, Beard, Onix, Michell, Heliuss and Foundation, while in the Mission room we spotted a souped-up *Cyrus Two/PSX* combo featuring uprated components throughout and a striking red paint finish – the latter just for the show. Called the *Cyrus Signature*, this highly specified version is likely to be twice the price of the standard *Two/PSX*.

One thing you can be sure of when going to the Paris show is that they don't do things by halves. Cabasse is a major supplier of loudspeakers to the French market, and, true to form, the company was holding 'live' versus 'reproduced' comparisons in one of the Sofitel's many large auditoriums. Unfortunately the string quartet decided it was time for a tea break just as JB and JK settled down in their seats. . . . The stage of the hotel's basement cinema was taken up by a pair of the biggest electrostatics we've ever seen – the *Sound-Lab A5s* with matching *B5* electrostatic subwoofers. How they got them in through the doors of the hotel we'll never know.

Nakamichi was making impressive music with its new DAT player, and the performance was pure theatre as a hushed audience watched the tape jockey operating the machine – he was wearing white gloves! Elsewhere we spotted the new *YBA Signature* pre/power combo, while the products of the show were undoubtedly Micromega CD players and Pierre Lurné turntables. They were everywhere.

Valve amplifiers are just as fashionable in France as they are in the UK, if not more so, and one particular stunner we spotted was the *Lectron JH50*. *Lectron* is a Paris-based manufacturer, the tube circuit has been designed by audio guru Jean Hiraga, and the quality of finish was gorgeous – all chrome and glowing bottles.

In the extremely whacky department, Triangle (no relation to our own Pink Triangle), which is best known in France for its loudspeakers, premiered a visually striking integrated amplifier featuring a triangular control panel which doubled as a status display and infra-red receiver, while down the road at Hotel Nikko everyone was talking about the *Symphonie 5000* loudspeaker in the AESD room. AESD stands for *Acoustique Electronique Serge Durey* – we don't know much about the company but the '5000

is about as idiosyncratic a design as you could hope to see. Standing over six feet tall, with separate enclosures for each of the six drivers – some of them suspended on arms either side of the main enclosure – the system looked like something out of a science fiction B-movie. Price, we were told, was 500,000 Francs (about £50,000!).

IN BRIEF

The first *Marantz CD 75 II* compact disc player to be won in our competition, run over the April, May and June issues, goes to Mr P Willerton, of Abingdon, Oxfordshire.

AESD high-end loudspeakers and electronics from France are now being distributed in the UK by GTC Ltd of Perivale, Middlesex.

West Ealing, in London, has a new dealer. *Audio Acoustics*

specialises in the range of *Audio Innovations* valve amplifiers, *Snell* loudspeakers and *Voyd* turntables and will be open 'til nine pm weekdays. Tel: (01) 998 9041.

Cassette tape supremo TDK has launched a new *Type IV* (metal) tape at £2.99 for the 90-minute version. New *MA* tape uses the same case as the *SA* (chrome) cassette and promises better magnetic properties to give improved dynamic range with 'plenty of headroom' to cater for the transient peaks of digital recording. *MA 60* is also available priced £2.39.

Peter Walker, managing Director of *Quad Electroacoustics*, has received the *Audio Engineering Society's* coveted *Silver Medal* in recognition of his work in the field of electrostatic loudspeakers and amplifier circuits.



Tasty looking *Cyrus* amps – the red's just for show.



On stage, 'he gargantuan *Sound-Lab A5/B5* speaker/subwoofer electrostatic system.



Above: *Triangle's* integrated amplifier – form, er, dictating function. Left: *Harmonie 5000* from *AESD* – whackiest product of the show?



Lectron JH 50 valve amp, designed by *Hiraga* and built in *Paris*.



Yves Bernard Andre's new *Signatures*.

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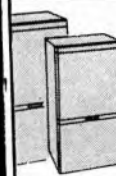
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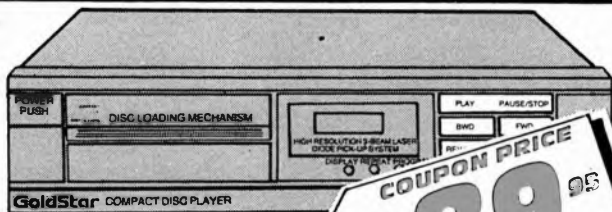


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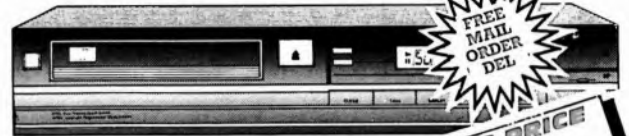
worth upto £59.95p! All the above are ideal as extensor speakers for another room, rea speakers for your main system, or an ideal gift.

Compact Discs



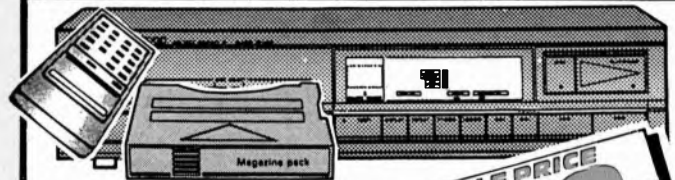
GOLDSTAR GCD613 An incredible deal that'll excite even the most dooby-down audiophiles after a hard days night. Throw a disc at it and allow it to seduce your ears.

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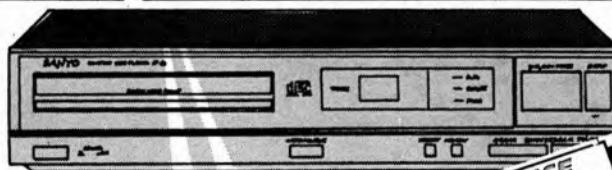
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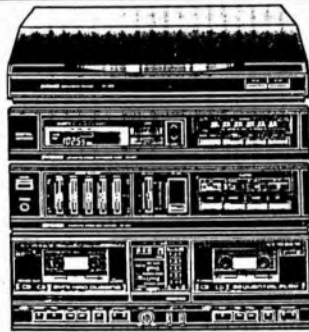


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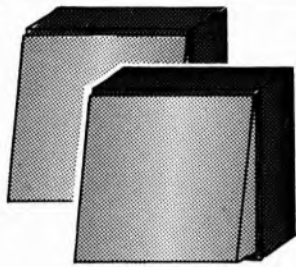


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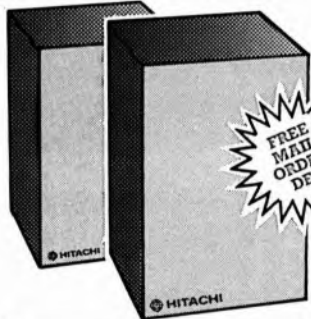
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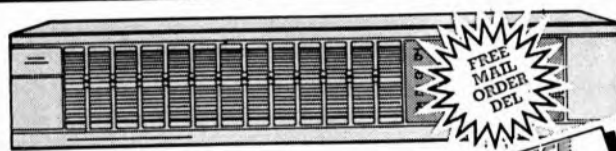
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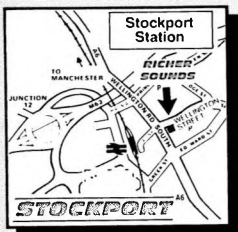
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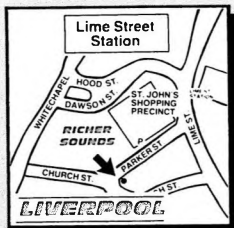
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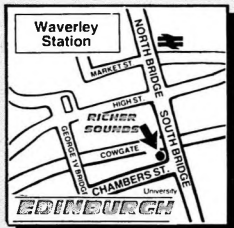
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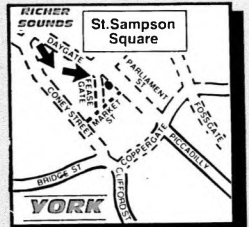
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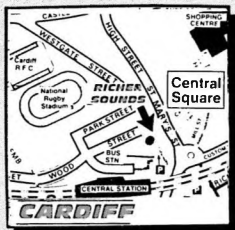
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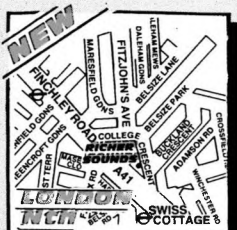
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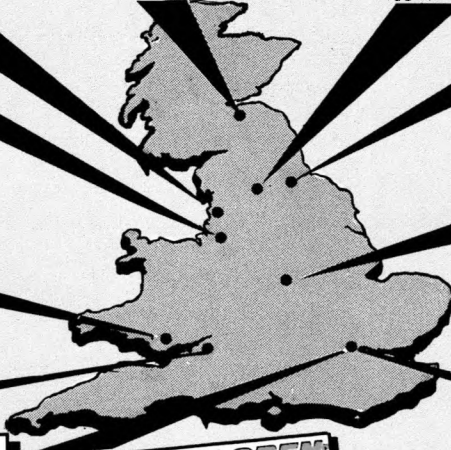
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CHOICE SESSIONS

Things we hear . . . This month, a powerhouse of an amplifier from C Audio; a new domestic Dolby system on the horizon and tuning in with Sony's go-anywhere ICF-SW1 radio.

POWER HUNGRY

John Bamford listens to a meaty power amplifier designed more for professional use than hi-fi applications.

The name C Audio won't mean a thing to most hi-fi hobbyists, though this Cambridge-based company has a high reputation in the world of professional public address and studio monitoring systems. In addition to heavy duty power amplifiers the company also manufactures a mixer-amplifier, 15-band graphic equaliser and a complicated electronic crossover (two/three way stereo, variable frequencies, variable damping etc).

C Audio's amplifiers were brought to my attention by the folk who manufacture ATC loudspeakers. A few months ago I was auditioning a pair of ATC SCM50 speakers and they recommended that I checked out the C Audio SR606 amplifier. "Great value for

money - we've not come across anything to beat it", they said. The 'SCM' bit of ATC's nomenclature stands for 'Studio Control Monitor' - these speakers sound exceptionally detailed and 'clean' and they're capable of producing astonishingly high sound pressure levels. The thought of giving them some stick with a heavy-duty professional power amp seemed like a cute proposition, far too great a temptation to resist. So try it I did.

The SR606 costs £1,144, for which you get a chunky black box rated at a cool 380watts per channel into 8ohm, 600watts into 4ohm. It can also be switched into bridged mono operation to produce a voice coil-destroying 1,200watts into 8ohm. There are three other amplifiers in the 'SR' range: SR202 (140W, £604), SR404 (260W £932) and SR808 (480W, £1,633). Finish is a little utilitarian, with plain black painted casework - none of your brushed aluminium fascias here - and

the SR606 is really designed for rack mounting, so the corners are a little sharp. You especially need to make sure you don't catch yourself on the corner of the front plate when moving the amp around - the amp is extremely heavy.

Unusually for a professional amplifier manufacturer, C Audio claims to hold great sway in carefully choosing passive components both for reliability and sound quality. Output devices are MOSFETS, the power supplies in all SR amplifiers feature over-specified toroidal transformers and high grade long life electrolytic capacitors, and each and every amplifier is hand built and individually tested.

The SR606 sports a pair of rotary pots on the front panel for level setting, rear switches for bridged operation and 'earth link' (this removes the technical ground from the chassis in multi unit hook-ups), as well as power on/bridge/clip/protect LED indicators on the fascia. To protect loudspeakers the outputs are disconnected by relay during power up and down; 'protect' is also operated in the advent of excessive DC offset or high temperature. All but the smallest C Audio amplifier (the SR202) include two twin-speed cooling fans.

Inputs, both normal and balanced, are all via XLR sockets, so to use my Audio Note phono-to-phono interconnects I had a pair of natty adaptors made up. Outputs are both XLR and the traditional 4mm socket/binding posts that we're more familiar with in hi-fi circles.

The SR606 is virtually silent in operation, fan noise being commendably low. The amplifier is also exceptionally well behaved, with no untoward bumps or thumps, while the feeling of sheer power and 'grip' on both high level rock and orchestral music proved to be a real eye opener with the ATC speakers. You felt that the system could simply get louder and louder without ever running out of steam, while the amplifier showed no sign of brittleness to cause listener fatigue.

With other speakers - I tried the Townshend Glastonbury, Snell Type C and Duntech Marquis - the SR606 was perhaps a little less successful. It lacks a bit of 'warmth' in the midband and has a tendency toward a somewhat monochromatic character - which means for leisurely listening in the home it's no competitor for the likes of a pair of Musical Fidelity MA50 monoblocks, for example. Still, what it lacks in finesse it makes up for in brute force. If your loudspeakers can handle the almost limitless power of the '606, and your nearest neighbour is at least a couple of hundred yards away, this heavy-weight from C Audio is a lot of amplifier for the money.

C Audio Ltd, Barnwell Road Business Park, Cambridge CB5 8UY. Tel: (0223) 211333.



A lot of amplifier for the money - C Audio's SR606.



DOLBY DEVELOPMENTS

Dolby Labs' SR system has given analogue recording a new lease of life in professional recording studios. As Paul Messenger reports, we could be seeing a new 'Dolby S' logo on up-market domestic cassette decks in the near future.

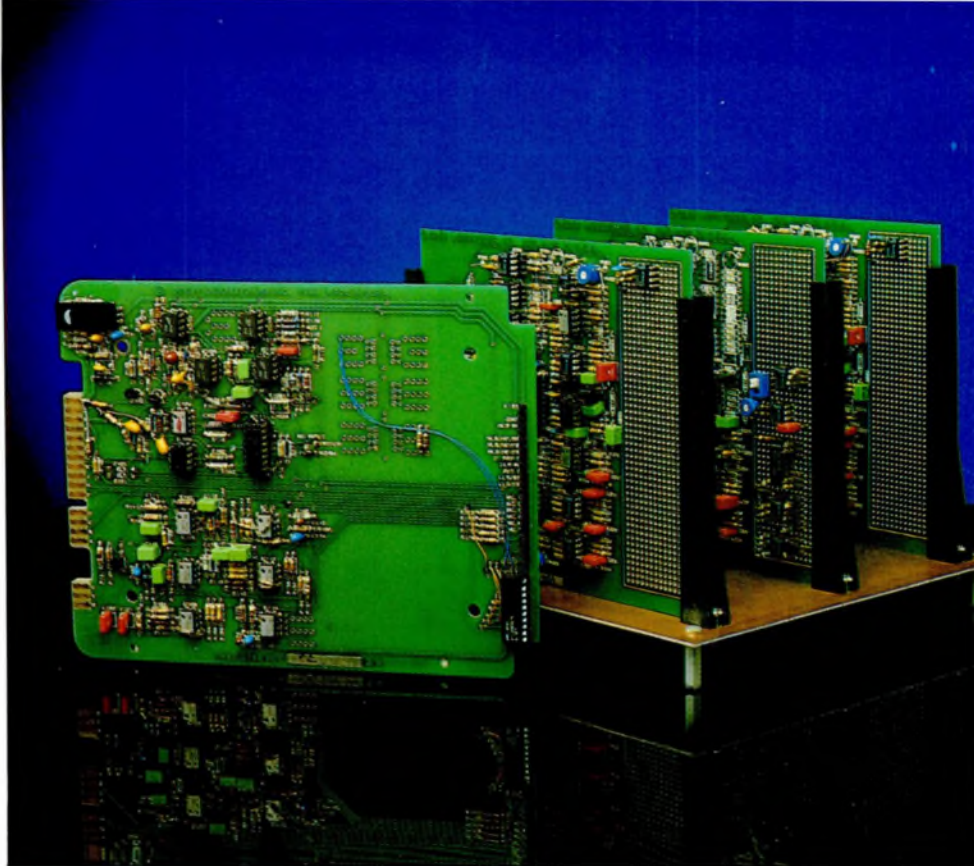
Ask the man on the Clapham Omnibus for the most familiar name in hi-fi, and the chances are he won't pick a manufacturing brand at all. Even hi-fi separates leader Technics only gets its name onto about one system in five, while Sony, Philips, Pioneer and so on follow on behind. But the one brand name that does crop up on practically every modern hi-fi system – not to mention plenty of portables, personals, ICE units, VCRs and even software – is that of signal processing and licensing specialist Dolby. In just 20 or so short years Dolby Labs has become the best known name in hi-fi, even if Sharon and Dave still call it Dobby.

The story started with the comparatively simple (but clever and exceedingly well timed) Dolby A and Dolby B 'companding' (compression/expansion) noise reduction systems, that first started appearing in the late '60s, and which are still going strong today. Dolby A is the more elaborate (and considerably more expensive) studio version. Multitrack recording techniques had already begun to get under way before it came on the scene, but A's noise reduction was the key factor that permitted very narrow track widths, and that in turn led to the worldwide expansion of multitrack studio facilities 20 years ago and effectively changed the history of recorded music.

Soon afterwards, the (equally clever and well timed, but simpler and much cheaper) domestic Dolby B system managed to give a measure of hi-fi credibility to the compact cassette medium. The cassette 'packaged' magnetic tape for the average consumer, with narrow track width and slow running speed which kept software costs low, alongside useful stereo/mono compatibility, though at the expense of a poor signal-to-noise ratio from a hi-fi point of view. Dolby B was just the thing to give near-hi-fi performance when used with a good quality mechanism, together with those low tape costs. Only die-hard enthusiasts and professionals continued to wrestle with the tape-lacing of open-reel recorders.

Dolby B's fairly gentle compander action was very well judged to match the capabilities of the available technologies, while the extra (expanded) treble on B-encoded material was often preferable to nominally flat recordings when used in cheap portable or in-car players. Dolby B spread quickly to pre-recorded material; the rest is history – B circuitry was fitted to over 30 million products in 1988 alone, and the figure is still rising.

Noise reduction for analogue tape recorders was just the start. Dolby has since had fingers in all sorts of pies: promoting Delta modulation for satellite broadcasting of digital audio; creating surround sound systems for cinema theatres (confusingly also referred to as Dolby Stereo). But analogue audio has remained the mainstay: the more powerful Dolby C noise reduction is now an extra feature on 50 per cent of Dolby B equipped cassette decks, and the fitting of Dolby HX



Dolby S at the breadboard design stage; the plan is to condense most of this into one integrated chip.

Pro is growing rapidly. (the B&O inspired HX Pro has nothing to do with noise reduction as such, though it does improve dynamic range especially with standard ferric tapes, by maintaining optimum bias characteristics.)

Though C offers significantly more noise reduction than B, its effects are also a little more intrusive if used without decoding, so C has never caught on for prerecorded material. It is therefore less relevant to out-of-home products, and has remained largely in the hi-fi separates ghetto.

Up until the mid-'80s, Dolby and its rival dbx battled it out amongst the analogue tape recorders in professional recording and broadcast studios. Then along came digital reel-to-reel, offering multitrack operation and razor blade editing, plus fabulous signal-to-noise ratios without any nasty compander processing. Fortunately for Dolby and analogue, it took several years to sort out between several different and incompatible digital formats. Two (DASH and PD) remain locked in market combat, leaving studio operators still uncertain which to choose, and unwilling to commit themselves until the outcome of the battle is clear.

Dolby Labs leapt opportunistically into this digital credibility gap three years ago, launching a new analogue tape noise reduction system which gave digital type signal-to-noise ratio specs, yet which claimed to do so with minimal direct signal processing. Dubbed SR (for 'spectral recording'), the clever marketing touch was to design the circuitry to be 'plug-compatible' with the Dolby A cards built into professional tape recorders. Out with the As and in with the SRs, and the studio could claim at least some comparability with the new and exceedingly expensive all-digital facility that had just opened up around the corner.

SR circuitry is hugely complicated compared to A, but the complexity is devoted to

analysing the content of the input signal in real time, so as to make the best use of the bandwidth/dynamic range 'performance envelope' of analogue tape. Although digital recording is undoubtedly the way forward for professional audio (for a whole variety of reasons), SR has nevertheless proved to be a substantial commercial success, especially in the mainstream recording studio environment, maintaining the viability of analogue techniques, extending the working lives of existing equipment, and indeed providing a less costly alternative to expensive digital equipment.

In much the way B was developed from A, Dolby is hoping shortly to introduce a 'consumer version' of SR, tentatively dubbed Dolby S. There's still some engineering and proving to be done on the chip sets at the time of writing, but if the planned timetable is followed there could be some new esoteric cassette decks with Dolby S logos appearing on the market about a year from now – hopefully just in time for the next year's *Collection* issue of *Choice*.

Although S processing is significantly less elaborate and sophisticated than SR, its development shows the remarkable pace of electronic development. Professional SR cards have a component count of over 1,300, including some 100 integrated circuits; the necessary precondition for consumer commercialisation is to get the essence of SR down to one or two chips – a process which will probably have taken about four years.

Dolby S has some links with Dolby C, though the principles have been taken much further. Spectral 'skewing' is applied at low as well as high frequencies to improve overload characteristics. The system is tolerant of level setting errors, while frequency response anomalies are not magnified in the way earlier Dolby systems have done. Indeed, it is claimed that S-coded tapes will sound

perfectly tolerable if replayed either without any decoding at all, or with Dolby B decoding – a claim which will certainly be put to the most stringent tests when machinery becomes available. This 'pseudocompatibility' will be the crucial factor which determines whether or not the music business adopts S-encoding for prerecorded material – which in turn will decide whether Dolby S eventually takes over the world (à la Dolby B) or remains primarily of interest to hi-fi enthusiasts (like C).

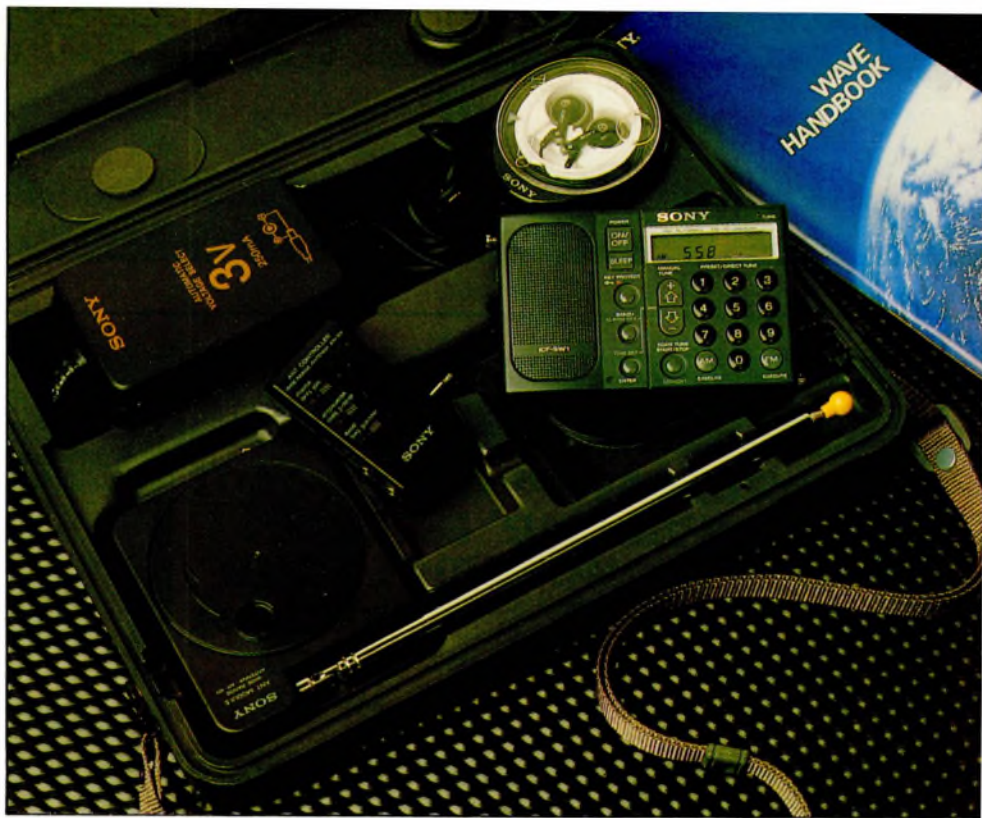
Despite the 'line-up tolerance', in the early stages Dolby is cautiously and sensibly planning to grant S licenses only for use with models which meet quite tight standards for frequency response linearity and electronic headroom, and which permit user-adjustment of azimuth.

Technically speaking, Dolby S operates symmetrically on record and replay (encode and decode). Most of the noise reduction processing takes place in side chains alongside the main signal path, sequentially according to two trigger thresholds at high frequencies and under sophisticated modulation control, leaving only the 'spectral skewing' and an additional post-high-level-processing anti-saturation network in the main signal path, to improve headroom and match signals to tape characteristics. At high frequencies, both fixed and sliding (frequency) band elements operate in parallel, to provide the best combination of the operating characteristics of these two approaches whilst still adhering to the underlying philosophy of 'least signal treatment'.

Fixed band action tends to give the best noise reduction performance for frequencies below the dominant signal component, treating all the signal frequencies equally and therefore equally spreading the loss of noise reduction effects which accompanies the actuation of compression. Sliding band operation is substituted when this can give an advantage, typically at frequencies above the dominant signal components, where fixed band systems are less able to maintain the noise reduction action. The key result of the undoubtedly complex spectral analysis necessary to control this processing is that noise reduction is well maintained even in the presence of high level signals and close to dominant signal frequencies.

From a commercial perspective, Dolby S could well provide the substantial overall improvement over B which C has never quite managed, alongside comparatively good (ie 'acceptable') compatibility between S-coded and unprocessed 'natural' recordings. If these two aims are realised, and the software industry is prepared to take it up for prerecorded music cassettes, Dolby S could be the crucial factor which extends the practical life of the compact cassette until well into the next century, undermining the decidedly shaky DAT edifice along the way.

Dolby isn't prepared to put figures on the actual performance and operating parameters S will achieve until the final commercial package is ready and proven. Given the SR performance, however, it ought to manage an S/N performance subjectively comparable with digital audio tape, and provide this without all the problems of changing to a new digital hardware format on a worldwide scale.



Shortwave sex appeal, Sony's ICF-SW1 with associated goodies.

SMALL IS BEAUTIFUL

Claimed to be the world's smallest shortwave radio, Sony's ICF-SW1 is certainly a pretty thing. JK checks it out.

The Sony *ICF-SW1* is nothing if not dinky, being marginally bigger than a cassette case but as well equipped as any radio that I've come across. I should perhaps qualify this as, whilst no stranger to the medium neither am I a ham, and so not entirely familiar with SW radios which may well be quite complex beasts.

The *SW1* is a four band FM/AM radio which can be used alone or with various plug-in accessories which can be carted around in a neat polypropylene case. This container, along with the mains adaptor, extra long powered antenna with an adaptor and tiny in-ear headphones, adds a premium of £100 to the lone unit's £150 price tag. However, the adaptor can be used at different voltages without adjustment giving the package considerable flexibility if you travel a lot, but then again the case and its contents tend to defeat the object of making such a tiny radio.

As it stands the *SW1* is fitted with a small loudspeaker and headphone output. It also has another 3.5mm jack socket which according to the manual emits a line level signal for tape recording. The sample I had didn't seem to produce anything from this orifice, but then it was a well worn review sample. Assuming this normally works and pumps out stereo (like the phones output) it could be used to hook up the radio to an amplifier.

The buttons marked 1-0 have two functions, both of which are pretty impressive. The more mundane is as presets for any frequency and the other is for direct frequency input. One can key in the frequency of the station required on either FM or AM and it will be tuned in immediately, which is a revelation to those of us who look upon presets as a luxury and is also nigh on an

absolute necessity if low power shortwave stations are to be found. For this purpose the kit comes with an SW handbook giving the frequencies and times of broadcast for national radio stations around the globe. For instance, Radio Pakistan can be found in Europe on 15605kHz between 7 and 11am and if conditions are good one can listen in, but there's not much point if you don't understand Urdu.

Other dinky features include a clock and timer which acts as an alarm by turning on the last tuned frequency, a button marked 'light' which if it were working would illuminate the LCD and a basic low pass filter tone control. Inevitably, because of its size the *SW1* isn't that easy to use. The buttons are small and the way in which they work isn't entirely conventional. For instance procedures, like presetting stations, take a while to remember as the keys often have two functions and are not really that clearly marked.

Listening with the little *MDR-E434* ear-phones the sound quality is quite impressive. Inevitably it lacks bass but separation is very good and FM reception unusually clean and transparent. During its short stay at *Choice* it was used as a *Walkman* substitute and worked well even without its internal aerial extended. The inboard speaker is considerably more limited but quite adequate for speech, and the phones socket was used to hook up to a full blown system and provides reasonable if not stunning quality, though I suspect the line output would be better suited to this application.

But what it does and how it does it fails to sum up the essence of the *ICF-SW1*, in fact its capabilities are almost secondary to its vocation in life, which is to be a sexy gadget. Yep, what we have here is in fact a lifestyle product – an accessory without which the true yuppie should feel naked, and one that sits alongside the expensive Sony *Walkman* and *Discman* as an indispensable object of desire.



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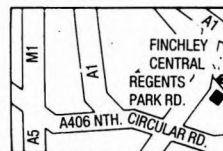
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ASPIRATIONS

Ian Kuah and the World Sports Car Magazine kit out a Porsche 911 with a fabulous in-car music system.



Music On Wheels

Sports cars are emotive subjects with any car enthusiast, and even those who don't fall into the category of car nuts often like a particular car for its shape – or even the sound it makes. In the supercar class – cars capable of over 140mph and breaking the six second 0-60mph barrier – the most talked about cars are Ferraris and Porsches.

Of all the supercars, the Porsche 911 has been in production the longest – 26 years being a long time in anyone's book. Part of that longevity stems from the fact that all the cars made from 1975 were fully galvanised. However, the emotional reasons of

why people like them are somewhat less logical. It has been said that the 911 is a triumph of development engineering over design because its rear-engine and swing axle configuration makes for handling characteristics that are not conducive to good health if the driver is not experienced enough to cope. This has created a sort of macho symbolism amongst 911 pilots who look down their noses at the newer water-cooled front-engined 924 and 944 cars as not being proper Porsches. The classic and timeless shape which evolved from the earlier 356 and the distinctive wail of the flat-six engine are other allures for the 911

enthusiast. Whether you're lucky enough to be the driver or just a bystander, it's hard not to have some reaction to the 911.

The editorial team at *World Sports Cars Magazine* are 911 fanatics. And we decided that we ought to build a show car in line with our status as a magazine that only deals with the most interesting and up-to-date hot-hatchbacks and supercars.

At this point, you might be wondering why this story is appearing in *Hi-Fi Choice*. To allay any fears that the publisher has decided to turn it into a car magazine, we ought to say that part of the concept of our show car was that it would incorporate a

state-of-the-art sound system which would be properly integrated while the interior trim was being done. Whether this would be analogue or digital based had not been decided at the time and there was a chance that it would become an equipment test bed anyway.

The prices of Ferraris have gone absolutely berserk in recent months, and these mid-engined cars (the older front-engined ones are definitely not affordable by the likes of us) are totally impractical from the point of view of high-powered audio fits as the engine bulkhead is immediately behind the driver leaving no room for bass drivers. Such cars need a lot of expensive cossetting and are also not practical for daily use.

The venerable Porsche 911 makes a lot of sense from this point of view as it does not rust in its later forms, and is reasonable on running costs, needing a major service only once a year with an oil change at 5,000 miles. Also, with the driving position closer to that of a normal car, it's perfectly usable in the grind of everyday traffic, and doesn't throw tantrums in rush hour jams by fouling its spark plugs or any of that nonsense.

We thus embarked on a search for a car that was mechanically sound but perhaps in need of a respray through neglect rather than accident damage. We could have bought a 1985 Carrera 3.2 but that would have drained the kitty of the funds needed

to turn it from just another 911 into our distinctive show car. Looking at prices, we decided that a 1982/3 911SC would be the right starting price. These cars also have the strongest engines of all the 911s – a well looked after late 911SC can run all of 180,000 miles before the engine needs a rebuild! From experience, we automati-



Red lining at twelve o'clock, an unusually oriented rev counter.

cally avoided cars that had spent their lives in town, so all the London retailers were given a miss. And the search ended at Autofarm, the most well-known of the non-franchised used Porsche dealerships who are based near Tring in Hertfordshire.

What Autofarm does not know about 911s is not worth knowing, and after taking advice from its ever helpful Steve Carr, we spotted a likely car that had just been taken in part-exchange against a 928S. The

car was a white X-registered 911SC Sport Coupe with a full Autofarm service history practically from new. It had been used as a business vehicle and had a very clean interior, always a sign of careful ownership. The white paint was less than pristine, and the wheels caked with brake dust – signs of a busy owner who seldom had time to wash it. However, that did not matter as the plan was to respray it to as new or better than new condition.

We're not in favour of radical body styling changes, particularly on a car such as this. However, the 5mph impact bumpers are rather ungainly, so we replaced these with fibreglass sections made by Autofarm. To clean up the rear, the 1988 style Carrera rear foglight and reflector assembly was fitted with its new metalwork being welded in while the car was in the bodyshop. This and the paintwork was expertly done by Surrey-based Ferrari restorer and painter Sebastian Clowe who produced a finish approaching that of glass. For the rear spoiler, the Carrera 3.2 style was thought more elegant than the Turbo style, and South Coast Performance Cars of Deal in Kent came up with a complete boot lid and spoiler from a Cabriolet whose driver had left his braking a bit late.

The 16-inch forged alloy wheels were sent to Chris Talabi of Diamond Styling in London for refurbishing. He is the only wheel refinisher in the country who can re-

anodise Porsche wheels to factory spec, and we asked him to colour code the wheel centres at the same time. A finishing touch was the Porsche factory enamelled centre caps which set each wheel off nicely.

So much for the exterior. Connaught Design now took over for the leather re-trim and audio installation. Andrew McKenzie recommended the excellent

designer who made up a new face for the rev counter. A Fischer C-box cassette holder system filled the void in the centre console in readiness for the music . . .

Fitting a sound system in a 911 isn't easy. Forget the fact that the car is no whisper quiet limo. With the bass profundo of the exhaust and the wail of the flat six that rises to a crescendo as the rev counter

we wanted to retain the rear seat/luggage area. We therefore elected to build a rear cabinet for four Alpine 6060 bass drivers wired in parallel and driven by a D-200 in stereo mode. For the front speakers, yet another high-end domestic importer came to the fore. Peter Qvortrup who imports Snell Acoustics and Audio Note and makes the superb Audio Innovations Class A valve amps, asked if we would like to try a pair of handmade Audio Note car speakers at \$400 each! These 120mm diameter units weigh in at 2.5kg and are full range drivers with a response of 70Hz to 18kHz. They are very exotic for home speakers let alone car units and use pure silver litz wire for the voice coil, have a cast aluminium basket and a 0.5kg Alnico magnet. Frequency response is flat down to 100Hz. These were built into small cabinets in the front doors with an internal support that angles them slightly upwards to minimise sound loss in the footwells.

Aesthetically the all-black TC-308 head unit is one of the cleanest and prettiest designs we have seen. The control buttons are curved and smooth to the touch, and a unique feature exclusive to Soundstream is the 'Playtrim' control. This is an additional circuit whose effect is akin to an extra treble control independent of the preamp's treble control. This functions on tape playback only and is said to restore proper treble response to tapes that may have been recorded with relative azimuth errors or with other problems of equalisation or high frequency response. This circuit sits ahead of the Dolby noise reduction chip in the audio chain to prevent Dolby mistracking.

As domestic audio buffs well know, there's no point in having the best equipment if you don't interface it properly, so we used Absolute Wire Force 4 speaker cable throughout along with Alpine and Monster Cable gold-plug terminated inter-link cables.

It was purely out of interest that we measured the D-200 amps at Mike Wells Car Stereo in Fulham. They easily met their claimed specs and in back-to-back listening tests with competing car amps, the D-200s quickly asserted the fact that while the opposition may sound like good car amps, the D-200s were more like good domestic amps. While others could conjure up sharp images in space with good focus, the D-200s actually could describe the quality of the space. They were more musical, had better pace and rhythm and let you listen into the performance in a way that was so obviously alien to the others, with vocals sweet and liquid in quality. In fact, we would have been quite happy to listen to this amp at home.

With this quality of amplification, we were expecting great things from the system, especially with the Audio Note speakers promising to be able to project all the information that the Soundstream head unit and amps could resolve. Initially we



Ease the seat back, put the pedal to the metal and burn rubber! And on the right, smooth in-car sounds by Audio Note, Soundstream and Alpine.

Pegasus leather for the job and we chose a light grey hide for the dominant colour with black piping round the edges. The dashboard was to be left black but its lower part was trimmed in maroon hide and this colour was also used for the flashes on the seats and door panels. The new pile carpet was a complementary grey also edged in black hide, and a finishing touch was the grey alcantara headlining.

While the car was apart, a Scorpion alarm system was fitted and tied into central locking, along with electric sunroof and window closers which activate when the ultrasonic key is used to lock the car. From the driver's point of view, the Momo three-spoke leather bound steering wheel from Eurostyling adds greatly to the pleasure of driving when out slaying serpentine roads. At the other end of the chain, a new set of BF Goodrich Comp T/A tyres were fitted which have proven superb in both grip and response in all weather conditions. In fact, we are surprised at just how many of the 204 horses can be reined in the wet. To get every last detail right in the cockpit, we decided that the rev counter ought to be rotated so that the red line starts at the vertical and one has only to glance at the position of the needle when pressing on. Julian Reap is an enterprising

needle edges towards the red paint, you need a fair bit of power if you intend to listen to music without distortion.

As the car had been trimmed and painted to the highest standards, we were keen that the quality of sound should match. Ricardo Franasovici of Absolute Sounds imports some of the best domestic audio gear that money can buy. He also imports Soundstream car audio from America. Soundstream was founded by Lee Adams, formerly a senior executive with Nakamichi USA. Lee started Soundstream with the aim of making the best car audio that money can buy and assembled a team of famous designers like Nelson Pass and Larry Schotz around him. The company has a pure Class A 25W per channel amp in its catalogue and the world's first electronic digital car crossover.

Ricardo suggested we use two of the 100W/ch D-200 power amps, one to drive the front speakers and one for the rear woofers that we had decided to build into a new rear shelf. The head unit was to be a Soundstream TC-308 tuner/cassette and we would use the DX-1 Digital crossover as well.

Soundstream does not make speakers apart from 8 inch and 10 inch sub-woofers which wouldn't fit the Porsche anyway if

had problems with the *DX-1* crossover. It seemed very sensitive to the Porsche's fuel pump relay and finally we substituted it for an Alpine two-way crossover which also gave us a lot more gain. We suspected it to be a faulty *DX-1* but by this stage we had run out of time to tinker.

For an American designed unit with their different tuner requirements, the *TC-308* radio section is most impressive. Soundstream has obviously done its homework well. The signal on stations around the South East of England was always strong and clear and devoid of the sibilance that can be so annoying. However, the excellent Hirschmann roof aerial supplied by Mike Wells was obviously of help here.

On tape, we were able to explore the limitations of the system in much greater detail. We had initially designed the installation knowing we could never generate really deep bass in a car with such space constraints. In fact very deep bass is actually tiring when you drive long distances, which is why car makers design out extraneous harshness and vibrations. We wanted tight and punchy lower mid-bass to underpin an open mid-range and clear and soaring treble and that's been achieved with a few reservations. Playback of commercially recorded tapes is excellent and the Playtrim control works well here. Using a combination of test tapes recorded on a Nakamichi *RX-202* and a *CR-7E*, we found that the Dolby tracking of the former was much closer to the *TC-308*'s than the latter and no matter what you did with the control, the moment Dolby was in the circuit, particularly Dolby C, you lost the highs and emphasised the bass. There is obviously a Dolby chip mismatch whose tolerances are accentuated by these two machines and we are looking into it.

However, at the end of the day, we have proven that it's possible to fit a high resolution sound system subtly into a supercar, and when you're not stationary, with the engine off, trying to squeeze every last bit of resolution out of the tape deck, but rather on the move enjoying the car as it should be, the system's basic musicality and fine balance is everything you need.

The Car: Porsche 911SC 1982

The System:

Soundstream <i>TC-308</i> tuner-cassette	£795
Soundstream <i>D-200</i> power amps	£495 each
Soundstream <i>DX-1</i> Digital Crossover	£239
Audio Note <i>2001-12</i> full range speakers	£400 each
Alpine <i>6060</i> mid-woofers	£72 each
Total system cost (excl installation)	£3,112

System Installation: Connaught Design, Unit 1 Warnford Industrial Estate, Clayton Road, Hayes, Middlesex UB3 1BQ. Tel: 01-573 0982.



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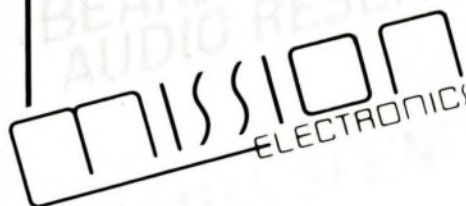
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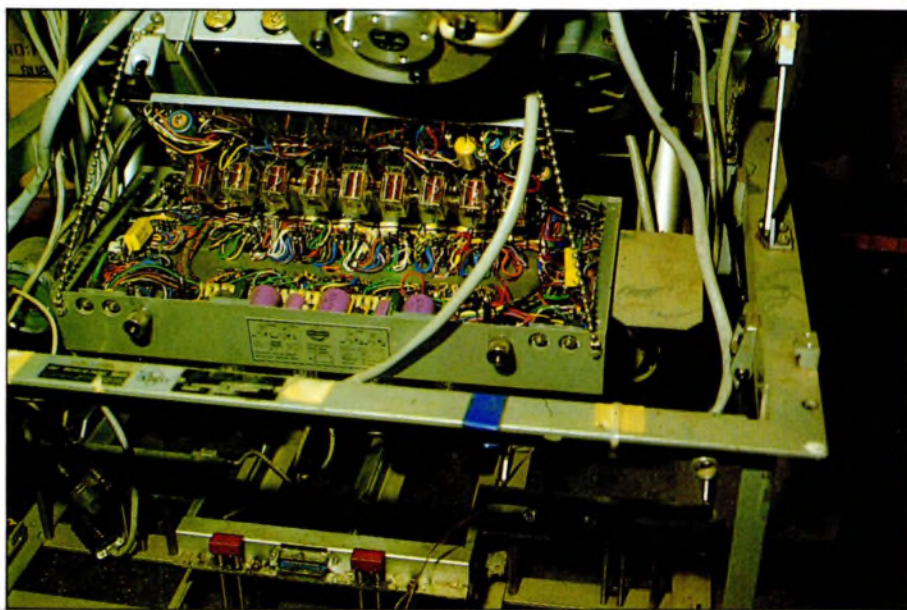
PERSPECTIVES

When he's not writing features for Hi-Fi Choice Richard Black can sometimes be found at the controls of a tape recorder, helping to make audiophile recordings for the independent label Altarus Records. Earlier this year we rescued an old Studer C37 from a builder's skip and asked Richard to catalogue the rebuilding and refurbishment work which would turn this workhorse recorder into an audiophile dream machine.

Coincidence can be a most wonderful thing. One Friday back in January, I was at home (unusual for me) doing some maintenance work on my car when the telephone rang. "Oh, Richard," said the familiar tenor of the *Choice* Editor (for it was he), "I'm so glad I caught you."

"Sounds urgent," I remarked, trying to keep my greasy paws off most of the phone and thinking, "It had better be urgent, too."

"I was just speaking to a friend at the National Sound Archive," continued JB, "who asked if I could suggest a good home for a C37 tape recorder – and I thought of you. The NSA has just bought some recording gear from Saga Records who are closing down, and is obliged to clear out this C37 too. But the removal team can't move it – and the NSA has no use for it anyway. I don't think any money is involved."



A classic recorder

I started to lose my concentration on protecting the phone from old engine oil. "You mean they're giving it away?"

"If you can take it away today, yes. Otherwise it goes in a builder's skip tomorrow morning."

Halfway out of my overalls already . . . "Where is it? And who should I speak to?"

A few phone calls later I was on my way to Saga Records' North London warehouse. The coincidence referred to above was not merely that I happened to be free on the right day, but that my old friend and collaborator Chris Rice was free too, and a convenient Volvo estate car was sitting in my driveway, borrowed from an acquaintance for tow-truck duty the following day.

At North London we found an almost empty warehouse with a C37 in its console sitting in the centre of the floor. "We couldn't get it down the stairs," explained the last remaining Saga employee in the building. Chris and I picked up the machine and carried it down the fire escape – a C37 only weighs a bit over a hundredweight with the electronics removed! The console followed, after

which we were able to sit back in a Friday night traffic jam and gloat.

All right, what is a C37? You might be forgiven for thinking it was the Crown Jewels, but in fact it's a professional tape recorder dating from the 1960s, built by Willi Studer AG of Zurich. And of all the tape recorders ever made, it is probably the most amenable to after-market audiophile 'tweaking'. This is especially interesting since we've already used two such machines which have been completely rebuilt to an audiophile 'T' by Tim de Paravicini, boss of Esoteric Audio Research (they of the valve amplifiers), freelance audio designer and fast car expert. A further machine, similarly rebuilt would provide a spare, a second recorder for very long session 'takes'.

The machine we use for Altarus recording is extremely precious to us – we can't afford to have it knocked about – however, a 'spare' machine would give us the option of taking it to pubs in search of good jazz without interfering with Altarus' work. Hence our enthusiasm when the offer arose; C37s are not very rare, but examples

in good condition are sufficiently uncommon that one cannot just go out and buy one. And the going rate is a bit more than the cost of a couple of gallons of petrol.

We thought it might be interesting and entertaining to chronicle the rites of passage of this venerable device, from dusty reject to audiophile dream machine. This article and one to follow (watch this space!) attempt just that. We shall describe the basic function of a professional recorder, detail the rebuilding that turns a workhorse into a racing stallion, and illustrate the result by featuring the finished article at a real recording session.

OPEN REEL REALITY

If you were not much interested in hi-fi before about 1970, you may never have used an open reel tape recorder. Open reel tape has always had the performance edge over cassette, but for most people and most applications cassette is perfectly adequate. Since open reel recording is much more expensive and less convenient than cassette, it is not surprising that cassette rules the hi-fi roost. However, cassette

recording is thoroughly inadequate for almost all professional purposes, and until the arrival of digital recording (and to a large extent since) open reel recorders were what professionals always used.

Magnetic tape recording, as in cassette, open reel and digital recorders, relies on magnetic patterns imprinted in a magnetic coating on plastic tape. The patterns are created by a record head and played back by a replay head as the tape is pulled past the heads by the transport. In any recording system quality is limited by two related factors: how much *information* is captured by the recording, and how much of it is reproduced by the playback system. The original music signal is information, while any noise, distortion or other undesirable artefact is effectively a loss of information.

Magnetic patterns on tape represent a certain amount of information, and it is not unreasonable to imagine that the more magnetic material one can use the more information is stored on it. This is why using wide tape and higher speed results in better quality. Tape characteristics are also important, obviously, but higher speed and wider tracks will improve quality with any given tape.

Other characteristics of a good tape recorder are not hard to define: the transport must move the tape past the heads at a very steady rate, or there will be wow and flutter; the electronics and heads must have low subjective distortion and wide bandwidth. Professional tape recorders all use three heads, as combined record/replay heads are an unacceptable compromise.

Unfortunately, in line with rather a lot of professional audio equipment over the last few years, the electronics in tape recorders has not got any better than it was, say, 15 or 20 years ago. It might have apparently better specifications, but the huge increase in complexity and the almost universal use of integrated circuits of less than audiophile performance has, if anything, resulted in worse sound quality than the simple but carefully designed circuits in older gear – like the C37.

I believe it was James Boyk (of Performance Recordings Inc.) who a few years ago marketed T-shirts with the slogan, 'Digital finishes what the transistor began'. The gist was that recording equipment has been on a downhill slope since the passing of the valve, and that digital recording is the nadir of this progress. It may be a simplistic argument, but many engineers agree that digital recording is not an unqualified success. Comparisons I have heard between quite modest analogue recorders and professional digital recorders were quite clear; digital recording in its present form lacks fine details that analogue captures, and adds almost subliminal, but irritating, distortions that analogue lacks. Hence Altarus Records' interest in reconditioning old analogue tape recorders.

Professional tape recorders need not be stereo. They may have 4, 8, 16, 24, 32 or 48 tracks, for applications where many microphones are used (allowing 'mix-down' to two-track stereo to be carried out after the recording session) or where tracks are recorded sequentially and mixed together later. However, most 'audiophile' recordings are done with only two microphones, and so a stereo recorder is all that is needed. Set up the performers so that they sound right from somewhere within the hall, then use two microphones painstakingly positioned so that the sound over the monitor loudspeakers in the control room resembles as closely as possible the sound in the hall. In fact, for recordings of normal acoustic music, from a solo violin to an opera chorus, use of more than two microphones is basically an expedient bodge or cop-out. You don't listen to a concert with 16 ears, do you? Use of many microphones is really only justified when it is not possible to use a hall with a good acoustic for making a recording.

BEHOLD THE C37

The previous section has painted a pretty clear picture of what one might look for in an 'audiophile' tape recorder. It will be analogue, using wide tape running at high speed, and with only two channels. It will have a high quality transport, good heads and suitably designed electronics. A C37 meets some of these requirements well, but falls short of some others.

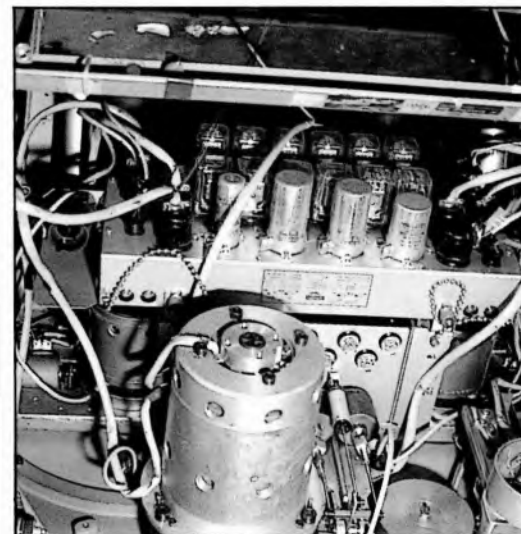
In standard form the C37 transport handles tape of ¼-inch width on reels up to 12-inch diameter. Tape speed is switchable to 7½ or 15 inches per second (ips), while at the higher speed (the more often used) frequency response is quoted as 30Hz to 15kHz within a dB or two. The transport and heads are mounted on a substantial aluminium casting, hinged at the back so that it can be tipped up like a car bonnet to allow access to the electronics below.

The electronics, which is almost entirely valve-based, is contained in large plug-in modules; two each of input and output amplifiers/equalisers, one power supply, one regulator and one bias oscillator. The transport is controlled by quite sophisticated relay logic. Two particularly endearing features always attract attention: current to the take-up spool motor passes through a large light bulb, which provides protection and a little help on start-up; and the transport includes a pair of electric scissors which, at the press of a button, pop up through the top plate and snip the tape. Unfortunately, there is nothing to stop the scissors doing this on record, or when tape is being fast wound, so the first modification is to remove the device from the deck.

C37 transports usually require only minimal attention to make them work perfectly. The spool and capstan motors are high quality Papst units which will run for

tens of thousands of hours without trouble. Tape supply tension is controlled by an ingenious servo-arrangement of two idler wheels on a rotating base, which is spring-loaded and damped and connected to a rheostat controlling current to the supply motor.

Two areas can be improved on the transport; tape speed and tape width. No serious audiophile recording will use 7½ ips, so it makes sense to increase running speeds to 15 and 30 ips. And since tape is easily available in ½-inch and one-inch



Left: No guts, no blood but plenty of wire, capacitors etc.

Above: Sophisticated analogue brawn from Willi Studer.

widths, it is tempting to adapt the recorder to handle wider sizes.

The audio electronics is of quite a high standard. Audiophile electronic design was pretty well unheard of in the 1960s, but a fair bit was known about what makes a good audio amplifier and the C37 designs are intelligently executed. However, some aspects can be improved, in particular bandwidth and phase response. Fortunately there is plenty of room in the modules to experiment. Input and output are transformer coupled via excellent transformers.

The power supply and regulator are generally satisfactory as found, give or take a dud valve or two. The bias oscillator however benefits considerably from major work in increasing the bias frequency, for reasons explained later. The bias frequency used in the original C37 was 80kHz, which is not really high enough – in fact over 300kHz would be ideal. Later Studer recorders use 240kHz, but throw much of the advantage away by using 80kHz for the erase signal, which makes the system function rather as if the bias were at 80kHz too.

Finally, the single most important assembly in a tape recorder, the heads, always requires attention after a few thousand hours as the heads wear out. The C37 heads were good in their day but are a weak link, so new heads are indicated. These may be custom-made or built for another machine and modified.



Esoteric Audio Researcher Tim de Paravicini gets down to the nitty gritty.

THE MODIFICATIONS

Work on the *C37* was entrusted to Tim de Paravicini for a simple reason – we knew he could do it properly since we had already used two such modified machines with exceptional results. Tim modified one *C37* for half-inch tape, and one for one-inch, for Altarus Records in 1986/7. One-inch tape is normally used for high quality 4-track or lower quality 8- or 16-track recording, but its use for stereo is practically unheard of. (As a matter of rumour, I did hear that Pink Floyd once had a custom one-inch recorder.) Still, as long as one does not want to exchange tapes with anyone else, this is not a problem – for record cutting sessions, one merely takes the tape recorder along to the cutting room.

MECHANICS

“Take nothing as read – trust nothing”, is Tim’s motto on reconditioning work, be it tape transports, electronics or car engines. In other words, even if a bearing looks and feels OK, dismantle it and re-lubricate it. Accordingly, the first stage is to dismantle everything on the *C37* bit by bit. Fortunately, Studer tape recorders are beautifully put together and easily taken apart for maintenance. The motor and idler pulley bearings can all be opened up by removal of a few screws, and the old lubricant can be cleaned out and replaced with fresh grease. Studer bearings are beautiful examples of prime Swiss engineering and have undetectable play when properly adjusted – and this is how Tim likes to leave them.

The capstan motor is a large Papst external rotor type with integral decoupled flywheel, enclosed in a thick steel case for low magnetic interference. The rubber idler wheel which holds the tape against the capstan imposes a large sideways thrust on the capstan, and that and the considerable weight of the rotor mean that the capstan motor bearings sometimes wear. In the case of our salvaged machine, Tim only had to clean and adjust them. This would be a nuisance if it meant removing the motor, but the motor must be removed anyway for a different reason.

Tape speed depends on motor running

speed and capstan diameter. Motor running speed is fixed by the winding configuration, so in order to achieve our objective of increasing speeds to 15 and 30 ips Tim has a sleeve fitted to the capstan. This is a job for a precision machinist. The sleeve is made of hard steel just under double the old capstan diameter, bored out to be a tight press fit on the capstan, hard chromed to take it just over nominal size, then precision ground to an accuracy of less than one ten-thousandth of an inch and a mirror finish. The result of such precision is exceptionally low wow and flutter (nominally about 0.01 per cent but probably better), essential for good stable sound.

The one-inch idler wheels Tim salvages from other Studer machines, including the *J37*, the one-inch four-track variant of the *C37*. Where necessary, these are recut on a lathe to make them run perfectly true, and then anodised for long life. For all the precision in the drive, we proved on the first Altarus’ one-incher that even a small amount of friction in the mechanical tape counter produces audible imperfections in performance. One cannot be too fussy about little details like that.

Instead of tape pressure pads, professional open-reel recorders hold the tape against the heads by back tension on the tape; the supply-side motor is lightly energised while the machine is playing. The varying diameter of the tape pack on the supply reel would make tension vary unless the motor was controlled, and this is done by the tension servo mentioned above. Operation of this servo is critical, and Tim scrupulously adjusts and checks the operation of the servo and related components. On our *C37* a small beryllium-copper spring had broken in one place and had to be renewed. This sort of thing adds considerably to the work involved in restoration! *C37* control logic circuits and switches seldom need attention, and our machine was well behaved.

Only one important assembly item is now missing from the deck – the heads. These will be covered in the next article, along with the audio electronics.

ELECTRONICS

Of the electronics modules, the power supply requires no work beyond visual inspection for broken insulation and leaking capacitors. The regulator needs only minor work done, including replacing a couple of rather obscure valves with more common types and associated circuit changes to accommodate them. The record and replay amplifiers come in for major surgery, which will be described in the next article. To conclude this first instalment I’ll outline the changes to the bias/erase oscillator.

The purpose of the erase signal is obvious: to provide a high intensity magnetic field which cancels the previous orientation of the magnetic field in the tape and

restore ‘random’ arrangement, ready for a new recording. The bias signal serves a slightly more subtle purpose. Bias is a high amplitude, high frequency (ultrasonic) signal which is added to the audio signal. Its amplitude allows it to orient the magnetic field in much the same way as the erase signal, except that now the field is modulated by the audio signal. In effect, the bias acts as a high frequency carrier for the audio, and it serves a similar function to the carrier in radio transmission or the sampling frequency in digital audio. The higher the bias frequency is, the better, and it is interesting to compare the typical 100kHz-250kHz found in analogue tape recorders with the 44.1kHz sampling frequency of digital audio.

Tim originally hopes to increase the bias frequency on a *C37* to about 500kHz, but so far he has not exceeded 150kHz. To achieve this means reconfiguring the bias oscillator with smaller capacitors to provide the higher frequency. The oscillator is an elegant design using a complex transformer and a couple of valves, and it feeds the erase head as well as the bias supply. Very high bias frequencies may require the use of a new transformer, but in this case the old transformer was perfectly adequate for the job, and the resulting bias waveform is as pure as the driven snow. (Noise and distortion tend to pop up as audio-frequency noise, so the bias signal must be very clear.) It has proved necessary to replace the cables to the erase and record heads with high quality radio-frequency cable, as the high frequency and high voltage of the bias and erase signals actually warmed up the old, lossy cable. Sound quality also benefits from this change, not surprisingly.

We now have a modified transport ready for one-inch heads, with a modified bias oscillator. All that is needed to complete the rebuilding project is some work on the audio electronics and the new heads. All that, together with some miscellaneous tweaks, and the recorder’s final assembly, testing and baptism will be chronicled in the October issue.

The deceptive external simplicity of a thoroughbred recorder.





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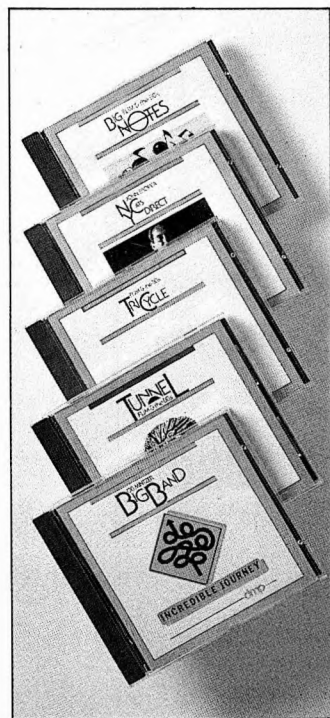
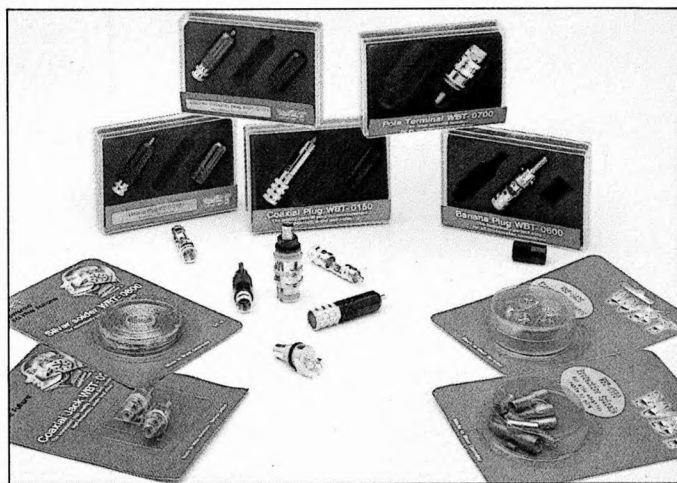
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READERS WRITE CHOICE ANSWERS

NO FREE LUNCH

As the owner of a pair of ATC SCM50a loudspeakers I was interested in your piece about the passive version of this speaker in the March issue. Suffice to say that after owning a variety of hi-fi equipment over the last 30 years I have found them the closest to my affordable ideal that I have come across, and am delighted with them.

But my purpose in writing is to say that you are perfectly correct in your suspicion that spiked stands could prove beneficial. I originally used my ATCs for a couple of months with the stands supplied, however, an in situ demonstration of Foundation stands, by Colin Howard of London Hi-Fi Services, proved their worth beyond doubt. An improvement in focus and detail resolution was immediately obvious.

I subsequently passed this observation on to ATC for its information but heard nothing further. I understand the company is touchy about what it considers the eccentricities of the domestic as opposed to the studio world.

Nevertheless, ATC didn't withdraw its previous invitation to my wife and I to visit and have

ATC SCM50a - even heavyweights appreciate rigid foundations.



lunch! Other manufacturers take note.

J. E. MEADOWS,
LONDON SW11.

YOU CALL THAT A PROBLEM?

Having read and re-read *Choice* over the last year I feel sure that you can help me with the following problem. I am lucky enough to have around £10,000 to spend on a new system. I have a very professional dealer advising me and we have assembled the following system: Well Tempered turntable and arm, Koetsu *Red Signature* cartridge, Audio Research *SP-9* preamp, Sonus Faber power amp and Amator loudspeakers.

Now, you may be thinking 'what's the problem?'. Basically, the result isn't quite what I'm after as the system is really too revealing and effortless for my musical taste - rock music - and I cannot feel the bass at all, it just seems to be there! I had originally envisaged a totally different sound to the one we have arrived at. Please could you advise me as to whether a studio oriented system would better suit my needs or suggest an alternative. Fundamentally, I



Smooth clean power from Wales.

want a balanced and exciting system that looks good.

ALASTAIR WATTS,
LIGHTWATER, SURREY.

What a dilemma, or is it? There shouldn't have to be a choice between accuracy and thrill power when adequate funding is available. Admittedly the better a system gets the more revealing it becomes, which tends to reveal the production shortcomings of many records, but not the majority. Even in the rock field there are thousands of good recordings which improve in entertainment value as the fidelity of a system increases.

But that said, it's quite possible to realise the result you are after for less than the amount you are proposing to spend, and there are rather a lot of options available. What you appear to need is a competent turntable and arm with a reasonably exciting cartridge, coupled to quick, powerful amplification and solid, full range loudspeakers. If that sounds about right, the following combinations would be well worth seeking out: Roksan Xerxes/SME V/Audio Technica AT-OC9 front-end, Bryston 12B/4B amplification and Roksan Darius loudspeakers. Or alternatively, try the Townshend Rock Reference/Excalibur/Garrot Decca Microscanner gramophone, Deltec DSP/DPA-50S amps and Townshend Glastonbury speakers. These loudspeakers aren't particularly beautiful but can be discreetly placed right in the corners of the room where they go down real low.

The first system is, I suspect, what you are after - it's very fast and tight and revealing enough to give insight into your records, but isn't too rude about the lesser recordings. The second system is based on the very new Rock Reference an awesome piece of equipment that is as quiet as a

CD player and is incredibly solid and controlled. It's also very transparent and heavily compressed tracks will sound heavily compressed - make sure you take some of your own records if you can audition it.

NO FIXED BUDGET

I have recently purchased a Meridian 207 CD player and an ITL MA-100 power amplifier. I plan to add a pair of new loudspeakers, to replace Sony SSE-50s, and possibly go for better amplification. I would be grateful if you could offer some advice on this matter.

My listening room is 18'x11' and I listen mainly to classical music. I have no fixed budget in mind, as I have no knowledge of the cost of very high fidelity equipment that would suit the Meridian. Perhaps £2,000 would be sufficient?

DAVID MCCLELAND,
GLASGOW.

How much you spend entirely depends on the standards you require - many would find a pair of, say £350-£400 speakers on the end of your present system to be quite adequate and enjoyable. However, spending more on better equipment will hopefully increase the fidelity of your system and thus your predilection to using it.

To make matters more complicated there is a baffling array of options that you could listen to. Meridian produces some particularly elegant active (with integral power amps) loudspeakers that would by nature be well suited to your CD player. About three years ago we reviewed Meridian's least expensive M30 (£775), but the current models may be an improvement on the rather mediocre quality encountered then.

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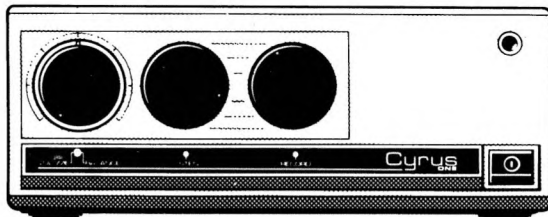
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207 if possible, are, Musical Fidelity MA-50/SD Acoustics OBS, Deltec DPA-50S/Monitor Audio R852 MD and Beard P35MkIV/Snell type J11s. All these combinations retail for around £1,500 or less, but try some less expensive speakers like the Snell Ks on Pirate stands with your ITL first as you may find them quite adequate for your needs.

USING A SLEDGEHAMMER TO CRACK A NUT

The sale offer of a pair of Celestion SL6S loudspeakers prompted me to make a long awaited amp/tuner upgrade, but, having bought the amp and tuner I no longer like the speakers. They seem too rich and boomy in the lower mid (even on domestically unacceptable stands). I am now using my old ARC Atoms with a Rotel RA 840BX3 amp. Although the sound is vastly improved I'm aware that I'm using a sledgehammer to crack a nut, and am wondering where to go from here.

The Atoms are remarkably controlled but their restrictions both tonally and generally are obvious. I want a sound which is alive and deep, but open, and free of the exaggeration and chestiness of speakers which attempt too much. Treble extension as such is less important so long as the quality is high. My musical preference is classical of all types, from radio and CD played at moderately high levels. My room is 21ft x 12ft and I mount my speakers on a wide solid windowsill. Finally, to the all important factor of budget - I have around £200-£300 but am reasonably flexible. Do you have any suggestions?

OWEN MANNING,
SHEFFIELD.

An open, free and deep sound from a wall or even window mounted loudspeaker that costs around £300 is quite a challenge. Unfortunately the majority of current speakers have been designed to operate on stands in free space. However, one model which should suit your requirements well is the Allison CD6. It's an American cube shaped speaker with the unusual feature of an upwards firing mid/bass driver. This design is by no means another gimmick - given the omnidirectionality of low frequencies it actually makes sense. It also reduces vibration in the tweeter's forward facing baffle.

Of course, the proof of the pudding is the sound which drew very positive remarks from our blind listening panel. For a full

assessment read Paul Messenger's review in our June issue. These wall mount speakers cost £290 and should be widely available, but if you have trouble finding a local dealer, call Allison UK on (0484) 603965.

TACKLING CABLES

Following your survey of loudspeaker stands, I replaced mine with Heybrook HBS1s and was amazed at the difference they made to my B&W DM2 loudspeakers. The rest of my system comprises Linn Sondek LP12/Asak turntable, Sony 337ESD CD player and an Arcam Delta 90 amp.

I would now like to tackle loudspeaker cables and as a first experiment, I have replaced my original stranded wire with solid core twin and earth. This was after reading your survey in November '88. I very much like the improvement in the treble and mid range but can't get used to the comparative lack of bass weight, which was a point that your review mentioned. I think that what I am aiming for is a fuller, weightier sound, and I wonder if something like Kimber 4TC would do the trick.

Bearing in mind that I use fairly long and slightly uneven runs of cable could you make any suggestions for an upgrade in this area?

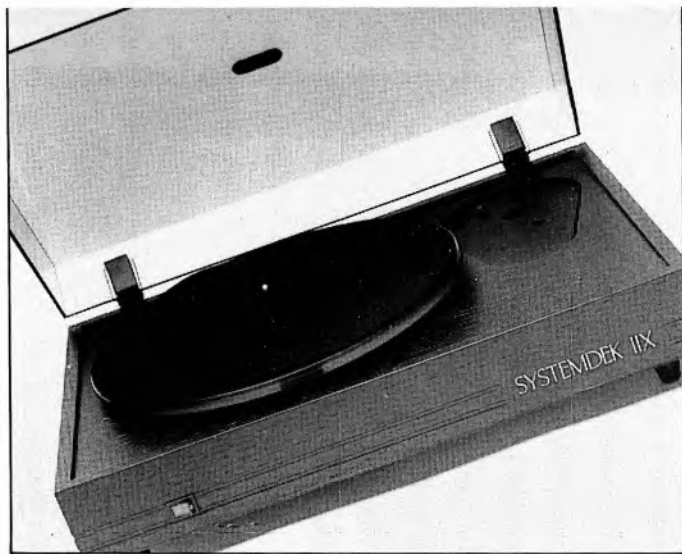
E. J. REED,
PLYMOUTH.

The drawback with recommending loudspeaker cables is that it's very difficult to accurately predict the sonic effect of a given cable in different combinations of amplifiers and loudspeakers. Our review of cables last year described the sonic character of 40 different cables, and those comments will basically stand true for most applications. However, when the character of both the amp and loudspeaker are mixed in the result can vary, sometimes to quite a considerable extent.

In this situation your choice of Kimber Kable 4TC concurs with that of Paul Miller who has used it with a Delta 90, and reports that it gives a warm and rich sound that is far weightier than that experienced with solid core. Given the higher than average price of this cable we would still recommend that you try to borrow a couple of lengths in order to confirm that the results are in line with the cost, before splashing out.

ALTERNATIVE SOLUTIONS

My system comprises a



A veritable wolf in sheep's clothing.

Systemdek IIX/Moth/Goldring G1010, Yamaha AX500 and B&W 110i loudspeakers. I would like to upgrade this system by spending approximately £850 on the front-end, but I'm unsure as to whether to go for a CD player or a turntable such as the Roksan Xerxes. I have about 400 records, but so many shops appear to be switching to CDs instead of LPs that I'm having doubts about the medium. The convenience of CD and the lack of an annual stylus change also appeals to me, but I'm not sure about the sound quality difference at this price level.

I like a warm, detailed sound with a large and open soundstage (without turning the volume up!), and dislike a bright and fierce sound, especially sibilance. Are there any CD players that can deliver the sound I require? If I opt for CD, would you consider it worthwhile to replace the Systemdek with a Mantra? I would also like to upgrade my amp to the Audiolab 8000A, and the speakers to Epos ES14s or the Arcam Two Plus.

ASHISH VARVA,
MANCHESTER.

Presumably you are a classical music lover as the supply of non classical vinyl is as healthy as ever, at least it is in the South. If that's the case then CD is an almost unavoidable necessity, although we wouldn't suggest you abandon records altogether as there is a significant amount of secondhand classical records around, and some of the older ones are extraordinarily good recordings.

As for CD players and the sound you are after, there are as yet no players that approach the fidelity of even the Systemdek - a highly underrated product, but more of that later. However, some CD players do approximate to your requirements better than others.

We suspect that something like the Marantz CD85 would be the best choice given your budget. But, rather than blow good money on a flawed medium we would suggest an alternative route to audio nirvana. This involves upgrading your Systemdek with a kit from R.E. Designs of Brighton (Tel: (0273) 672796). For a total of £64 R.E. supplies an acrylic platter and an aluminium armboard, cut out for your tonearm, and even includes appropriate spacers to maintain correct VTA. The job of fitting and setting up the turntable is quite straightforward and instructions are included for guidance.

You may be wondering whether the Systemdek is worthy of such tweaks, but if you heard it in the context of a very revealing system you wouldn't be as it's a very competent turntable worth partnering with good quality arms, cartridges and systems. And this is where our second suggestion comes in. That is, that you trade in your present amp and speakers for an Audio Innovations Series 300 integrated amplifier (£425) and a pair of JPW AP3 speakers (£210) with heavyweight Pirate or Foundation stands. This should leave you just enough for the star budget CD player of our last review, the Marantz CD583 which is said to be of "virtually audiophile status" in sound quality and costs a mere £150.

This may not have been as straightforward an answer as you may have hoped for, but is one which will provide a level of musical information which would surprise many.

EDITOR'S NOTE

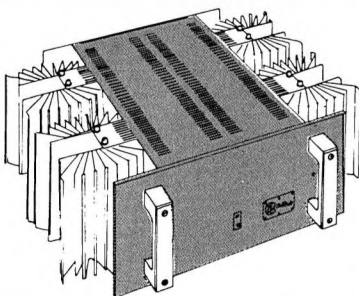
Unfortunately we are unable to answer all the enquiries we receive. The letters we publish are those which we think will be of greatest general interest.

THE ART OF LISTENING

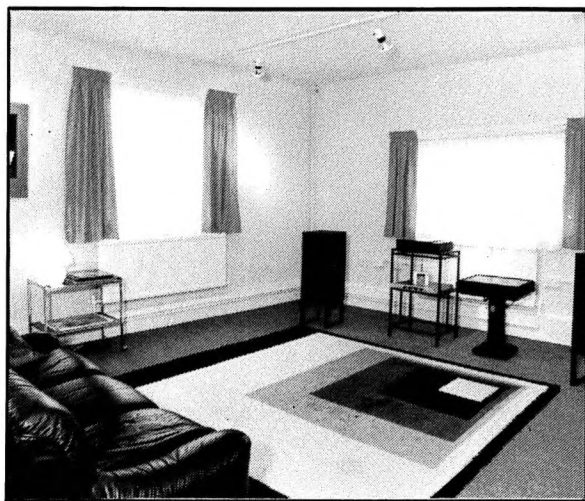
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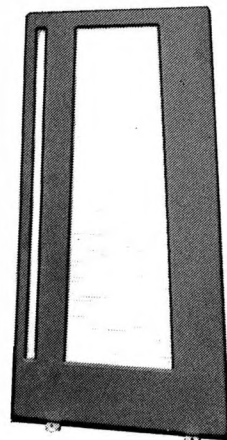
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The most significant loudspeaker development must surely be the new Apogee Duetta Signature. We are all Apogee enthusiasts here but the improvement in sound quality with this model has amazed us. A true 'state of the art' product. Lower down the price range we must mention the new Magneplanar 1.4 which is a huge improvement in standards but amazingly costs no more than its predecessor at £1098. The P.S. Audio 4.6 with a new power supply is also a big improvement and at under a £1000 is probably the best pre-amp around at the price.



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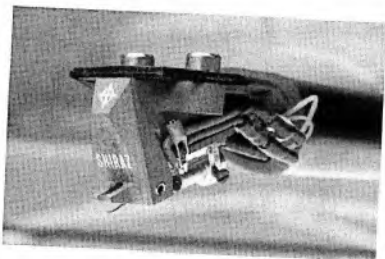


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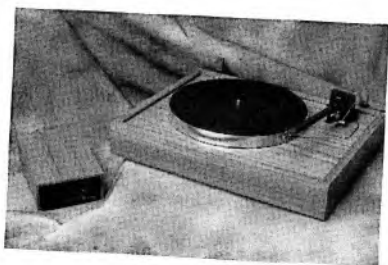
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THE SPECIALISTS



MARKET RESPONSE

In our exclusive survey Dan Houston polls specialist dealers up and down the country asking them about their best selling system combinations.

The small print near the end of the System Building introduction to our *Directory* says: "the key to getting the best results from a separates system lies in finding an experienced and skilled dealer in the first place". At *Hi-Fi Choice* we promote the small independent specialists whose advantages over the multiple retail outlets are that they generally offer a knowledge and service over their white-socked contemporaries, resulting in a better deal for the customer in the long run. Good hi-fi should be something you want to listen to; it should be distracting you from your television, for example. And it should be chosen with care. Contrary to popular opinion good hi-fi starts at a comparatively low price point for what it does; reasonable systems giving years' of pleasure start at a little over £300.

This issue of *Choice* deals with separates systems – made up of components from different manufacturers to create a set-up that hopefully sounds better than the sum of its parts. Fashion in hi-fi is a dubious notion but the existing mores dictate the au fait will rarely have two pieces of equipment from the same manufacturer. The only 'one-name' systems recommended from dealers here were Linn and Arcam set-ups.

It doesn't have to match in price either; just as style victims wear a Jean-Paul Gaultier shirt over their Levis, so one can spend differing amounts of money on the various system components. Several dealers here wouldn't bat an eyelid if you spent 70 per cent of your budget on the source (or front-end) with the rest on amplifier, loudspeakers and stands. But hi-fi should reflect enjoyment of music, Audio Venue giving us the following advice for novice collectors: "If a guy comes in for a Linn *LP12* and we find out he's only got 20 records, we say it's not worth it; he should buy a Revolver and another 100 records."

The market for separates systems has been inferior to the midi-size one-piece market but recent research commissioned by Sony UK shows an upward trend towards separates this year. In the light of this Sony has launched a range of 65 separates

for its 1989 range. This is good for the hi-fi cause as opposed to the 'audio conquest' generally; several dealers we spoke to do not stock midi-systems on the basis of their sonic inferiority.

Buying separates stems from the generally accepted idea that hi-fi manufacturers have strengths in different areas. Even a huge firm, such as Sony for example, privately admits that it doesn't make the best record deck in the world. The secret then, is to find the best equipment from each manufacturer and mix it together to produce something synergistic (our favourite word). And this is where the strength of independent dealers lies. Their range will offer several combinations which should reflect the best of what is available and which should 'go well together'. David Campbell of Zeus Audio, told us: "we spend a long time choosing and getting agencies; all of our equipment is chosen for its neutrality of sound and most of the components work well together."

Campbell continued that because of this it was also advisable to stick with the same dealer once you have found him (or her). "We get problems with people coming to us from other dealers with a view to upgrading part of their equipment; it's difficult if you're not familiar with the rest of their system to know what something will sound like in that context." Many dealers are now offering home demonstration facilities which overcomes this problem and also the difficulty of finding out whether loudspeakers work well in your room. For instance if you hear something in a dealer's demonstration room (even if it's acoustically flat) it will sound very different if say your room has an extremely high ceiling.

Upgrading over the years with the same shop means that many (typically high-end) dealers have regular customers from far and wide. Acoustic Arts of Watford told us that only seven per cent of its customers were local and lists regular customers from as far away as Humberside.

SOUNDING RIGHT

While there is no scientific proof in the theory that different

components from different manufacturers sound better or worse together, the dealers we spoke to for this survey maintained that synergy in system building (ie mixing the cocktail so that it doesn't make you feel sick) was something that had to be tried and tested. This is where a dealer's advice and experience is most important. Several told us that customers were coming into their shops with a copy of *Hi-Fi Choice* under their arm pointing to a string of Best Buys from the *Directory* and wanting to make a system from the components. "It doesn't always follow that because the components sound good individually or in the reviewer's system, that they will sound as good together," was the sort of repeated comment we heard. Matching components to get the best sound has long been the quarry of high-end enthusiasts and it was interesting to hear the philosophy applied to more run-of-the-mill products.

While *Choice* is trying out some separates formulae this month, several dealers were adamant that the choice should be up to the customer whose ears are going to be on the receiving end of his decision for possibly years to come. To this end many dealers see their task as ascertaining in which direction you want to go during an hour or two's demonstration. Chris Lyons of Lyon Audio, said: "if you know your equipment and how it sounds together you can quite quickly arrive at what the customer wants."

WHERE SPENT?

We asked dealers which part of the system should get the bulk of the budget and unsurprisingly heard "the front-end" from over half of them. In the early '70s the answer would probably have been the opposite, with loudspeakers considered all important. It's such old hat to mention the Linn Products' design team changing that philosophy that we won't do so here. Dealers rightly mentioned that a great pair of loudspeakers will only show up the faults in the rest of the system. This was commonly borne out by recommended combinations fronting with the Linn *LP12* turntable, *Basik* arm

and *K9* cartridge and then the cheapest Naim (*Nait 2*) amplifier and some Linn *Index* or *Helix* loudspeakers.

Audio South told us that if someone wanted the best vinyl playing combination possible for £900 it would recommend he spend £700 on the *LP12* with cheapish arm and cartridge and then £100 each on amplifier and loudspeakers. John Oakman of AT Labs said that a "silly but fabulous combination" at around £700 would be the Philips *CD 880* CD player (£500) a Yamaha *AX300* amplifier and pair of Mission *761* loudspeakers. "People say you should spend as much on a turntable as possible and the same goes for CD players; that system really makes a bit of magic," he explained.

One dealer said loudspeakers were the most important part of the system, while another said it was the amplifier, but several offered caution with the "go mad on the source" approach. These dealers mentioned that while buying an *LP12* was a good option if you can afford to upgrade in a few months, most hi-fi buyers only replaced their systems every five years or so and that a balanced system moneywise was a better option.

It's just as important to incorporate loudspeaker stands and cable in your budget. In our Loudspeakers issue (June) several dealers mentioned that spending as much money on stands as the loudspeakers themselves was beneficial in terms of sound quality. Rob Dowse of Definitive Audio even went as far as recommending a pair of £150 stands with a pair of £125 loudspeakers as being a much better option sonically than a £300 pair of loudspeakers. Several dealers told us that when someone was buying a system from them they would include stands (usually Target) free and two thirds of those we spoke to said they would include some cable (most popular: QED *79* strand) free as well, with the option of paying the difference if you wanted something "more serious".

Where hi-fi furniture was concerned the Target and Appolo ranges of two or three-tier tables were most popular for isolation of equipment and many dealers

have been impressed with the recently imported range of Italian Audio Tech tables for more expensive equipment.

BEST SELLING

The original idea behind this survey was to offer readers some distillation of dealers' best selling systems and to see if there was a pattern to matching components. The task was quickly dashed and as David Campbell (Zeus) pointed out: "this is very hard; I never sell two systems the same in a year." The multifarious nature of dealers' recommended systems is a healthy sign for the industry, showing that many varieties can be put together without injury and also partially destroying the myth that certain components don't go well together; although Campbell's earlier comment on sticking with the same dealer still makes sense.

In view of the fact that there were barely two systems the same in the budget (sub £500) category we have compiled a few of the best selling elements, throwing caution to the wind in suggesting they are compatible. For vinyl users, popular record decks were Ariston's *Q Deck* followed by the Rega 2 and 3 models with the Marantz *CD6511* and Denon *DCD610* for CD. Popular amplifiers are the Arcam *Alpha 2*, Rotel *820A* and NAD *3020E*. Loudspeaker preferences seemed divided between Royd *A7s*, Tannoy's *Eclipse*, Mission *761s* and Celestion *3s*.

In the mid-price bracket (sub £1,500) the Arcam *System 90* was favoured with the Marantz *6511SE* CD player being the most popular source. The Marantz was linked to the Audiolab *8000A* by several dealers (with Heybrook *HB100* loudspeakers in a couple of cases). Other popular matches were the Mission Cyrus *Two* amplifier with Mission's *782* loudspeakers and Naim's *Nait 2* integrated amplifier with Linn Products' *Helix* loudspeakers. A couple of dealers mentioned Linn's *LP12* turntable, Basik tonearm and *K9* cartridge fronting this set-up.

Linn and Naim aren't always obvious bedfellows and we heard of Linn sources and speakers with the QED *A270* and Ion *Obelisk 2* or *3* amplifiers for



SEE Revolver: advisable for novice collectors.

example. The Audio Innovations *Series 300* integrated valve amplifier was coupled with Snell *Type K* loudspeakers on two occasions fronted variously by a Roksan *Xerxes* deck and Rega *RB300* tonearm or Systemdek turntable with Helius *Scorpio* arm.

With more expensive equipment (over £1,500) the Linn/Naim heirarchy was more apparent with *LP12/Ekos/Troika* (turntable, arm and cartridge) hooked to Naim *NAC 32-5*, hi-cap, *NAP 250* amplification with either Naim *SBL* loudspeakers, Linn *Kans* or *Sara 9s*.

In this area more audiophiles buy record decks than CD players and the only CD system we heard of was a Meridian *207* player or Sony *557 ES* linked to Krell's *PAM 5* preamp and *KSA 50* power amps with Sonus Faber *Electa* loudspeakers. Snell *Type J* loudspeakers were again being powered by Audio Innovations amplifiers, notably the *1000* pre and *Triodes* power combination, but beyond this there was little duplication.

In a previous similar survey dealers had noted that record users with expensive set-ups were only buying an ordinary CD player to listen to the new medium. This trend appears to have changed and several dealers said they were selling more expensive CD players such as the Meridian to audiophiles. On the more general level, most of the dealers we spoke to said they were now selling more CD players than record decks.

RELIABILITY

One of the dealer survey's main tasks is to offer some consensus of opinion on reliable and unreliable products in the market at the moment. There have only been a few instances of marked unreliability during the period the survey has been run, and dealers usually point out that reliability goes hand in hand with price, often bemoaning company

cost-cutting which results in their having to pick up the pieces. During past surveys CD players and cassette decks have (by virtue of their complex mechanics and circuitry) been found to be the most unreliable elements in the hi-fi system.

Common complaints for CD players are faulty drawer mechanisms and poor tracking, causing 'jumping or sticking' during play. The mass production of discs themselves has also led to problems, with holes in the middle of discs being off-centre causing tracking problems for example. Dealers also mentioned that many of their CD player 'repairs' were cleaning the laser lens which can become clogged with dust.

Paul McMichael of Better Hi-Fi told us "80 per cent of CD player problems are contamination of the laser". In May we mentioned that Path plc was testing an American lens cleaner with a view to importing it in the UK. The cleaner looks like a disc with a brush near the centre that aligns with the lens to remove dust particles. So far Path has not decided whether to import the cleaner which is recommended by several CD ROM manufacturers.

Problems with cassette decks were said to be mostly user-oriented with dirty heads and pinch rollers eventually clogging up and forcing the machine out of action. The best way to avoid this is using cotton wool buds and some pure alcohol such as isopropanol, but dealers also mentioned that the Allsop 3 cleaning kit was popular and particularly useful for cleaning car stereos where the heads cannot be reached. Periodical demagnetising is another recommended 'service' to keep a cassette deck sounding sweet with hand-held versions, such as the £7.99 Milty *Magnett IX Demagnetiser* preferred.

Loudspeakers are generally very reliable unless you try to

push them with an under-powered amplifier. This would mean turning up the volume so that the amplifier goes into 'hardclip', producing distortion which in turn blows the drive units - a typical party-time trick.

In view of the limited size of this survey it was felt too difficult to offer advice on reliable and unreliable brands as we have with previous surveys. Most of the well-known brands have become so because of their reliable product and while there are glitches where it's obvious the household names are getting it wrong, generally dealers are happy with the way things are going. It doesn't follow that the British cottage-industry type firms will not deliver reliable products either; many dealers prefer dealing with them for the speedy and flexible service they can give.

For this market survey we telephone-pollled dealers up and down the country in a bid to distil some of their advice on system buying/building. Twice as many of these dealers told us they sold more separates than midi-systems so hopefully their advice is well-founded. The survey is a poll based on dealer comment and in this limited case it only reflects the more common names.

PARTICIPATING DEALERS

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

Acoustic Arts, Watford, Hertfordshire.
Aerco Ltd, Woking, Surrey.
Analog Audio, North Finchley, London
Andrew Thomson, Kircaldy, Fife.
AT Labs, Enfield, Middlesex.
Audio Venue, Crystal Palace, London.
Beaver Radio, Liverpool, Merseyside.
Better Hi-Fi, Liverpool, Merseyside.
Billy Vee Sound Systems, Lewisham, London.
Cambridge Hi-Fi, Cambridge.
Chew and Osborne, Saffron Walden, Essex.
Definitive Audio, Brighton, Sussex.
Grahams Hi-Fi, North London.
Island Compact Disc Centre, Ramsey, Isle of Man.
Lyon Audio, Stanway, Colchester, Essex.
Norman Audio, Preston, Lancashire.
Now That's Hi-Fi, Portsmouth, Hampshire.
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CHOOSING AND USING . . . SEPARATES SYSTEMS

There's more to assembling a good system than picking great components. AG investigates the black art of system building.

The test that follows is constructed a little differently to the tests you're used to seeing in these pages. As usual we're looking at product, that is the review covers high fidelity equipment. However, rather than look at each item in isolation, what we've done is to assemble them into systems and looked to see how they behave in combination.

To flesh out the bones a little, the basic idea was to assemble a range of systems at different prices, which stretch from around £500 to over £7,000. These were to be full blown hi-fi systems of the kind you'd expect to be offered by specialist hi-fi dealers. The systems were to include a record player and a CD player in each case – these being the main sources of high quality music – plus an amplifier and loudspeakers.

If you think cassettes or radio ought to have been included, the answer is that even if you consider them to be on a qualitative par with CD and records, they really don't raise the same issues of system synergy. In any case it would be quite absurd to regard cassettes as the equal of CDs or records, if only because the best quality recordings widely available are the secondhand copies you make from CDs or records, which by definition must be worse than either. By and large, prerecorded cassettes continue to be a joke, and although FM radio can sound very good, it cannot be regarded as of equal status to other sources since you're constantly at the mercy of the schedulers who put programmes together. You can't just reach for the tuning control and dial in a Beethoven sonata at will. For better or worse radio enjoys a special status and has to be considered separately.

It was HFC's editorial staff that did all the sticking of pins into lists; this seemed the easiest way of ensuring that I could not be accused of trying to justify my own decisions. What they did was to 'design' ten systems using components of (generally) known good performance, that are available from a respectable subset of specialist retailers. The idea was not to pursue brand

new, state of the art equipment, though inevitably some of the CD players are of recent vintage and offer quite sophisticated technology.

The Denon *DCD-1520* for example, which is certainly an important new design, gets its first *Hi-Fi Choice* outing in this test. The same applies to certain other products, whilst others have been updated recently in one way or another and so haven't been reviewed in their current form. Nevertheless, on the whole the products that follow are tried and tested and they have a reputation. It is their reputations that we put to the test.

CD OR LP?

One question is implicit in the form of the test adopted, and it concerns the parity or otherwise of records and compact disc. Which is better? As so often in this kind of situation defining the question takes us more than half way to finding the answer. What then do we mean by better?

The term can have several meanings. For the owner of a large record collection who puts music first, compact disc isn't even going to enter the equation, at least not yet, whereas the active collector who is thinking a few years ahead would be foolish to ignore compact disc. Anyone starting a classical collection as of now, and whose interests do not extend to back catalogue, would be pretty silly to think in terms of analogue record replay.

The Marantz CD-12LE used as a benchmark throughout these tests.



But this isn't the usual meaning of the question, which might best be approached as follows: Which source is best for judging the merit of the ten systems on the following pages?

With the benefit of hindsight – the introduction was written last – it worked out something like this. On the whole, record decks are clumsy and awkward to set up, to run in and generally to keep on top of their temperamental natures. To this extent record decks are a bit like racehorses, whereas compact disc just kind of chunters along regardless; fulfilling the equine equivalent role of a donkey. That is the thing about black vinyl, it always has been a pain in the butt and it surely always will.

But compact disc isn't entirely plain sailing either, despite the propaganda. The players do need to be run in, they respond to the surface they're sat on, and of course the kind of interconnect wiring used too. But CD doesn't need the complexity of a phono input, and in fact can often dispense with a preamplifier altogether. Just how important these things are can be seen from the example of the Bryston amplifier system, which has a relatively poor sounding MC input when compared to the rest of the amp. This isn't uncommon. The NVA amplifier (also included in our test) has a purely passive line and CD input stage, which is the way preamplifiers generally seem to be developing these days, even those that are built into

integrated amplifiers.

I'd still choose records though. At least on the better systems, I found records to be consistently more capable of teasing out the essential qualities of a system and the music being played than compact disc. At least when my attention wasn't being distracted by the usual plague of analogue style ills – scratches, noise and the like. These cosmetic problems shouldn't be too severe if your records are half-way decently cared for. But to anyone who turns around and says that he can't bear the hiss and crackle, I have no answer. These people will be better served by compact disc, and that's all there is to it.

But as I have said, on the whole my preference remains with records. They simply sound better, by which I mean that the sound is in some strange, indefinable way more expressive, meaningful and, ultimately, communicative. Communication of course is the essence of the exercise we dignify with the label hi-fi, and any system that communicates more eloquently or more completely has to get my vote. The failings of compact disc in this area are fairly subtle, but they exist in far too high a proportion of players to be ignored.

Having said this, I don't think there's anything intrinsically wrong with digital processing, and I simply don't believe that it's necessary to appeal to any such magical mechanism to discover why it is that compact disc doesn't always deliver the goods.

I'd suggest that the real reason for the superiority of records is very much closer to home. There's plenty of circumstantial evidence to support the view that even where CD players retrieve a fairly complete version of the signal off disc, the analogue circuits in the player still aren't particularly good. Many if not most CD players sound rather like unimpressive cheap amplifiers. Even the supposedly good ones seem to suffer, perhaps because trying to mix very high frequency digital signals with low frequency audio in one box is almost bound to fail. It is very difficult to maintain



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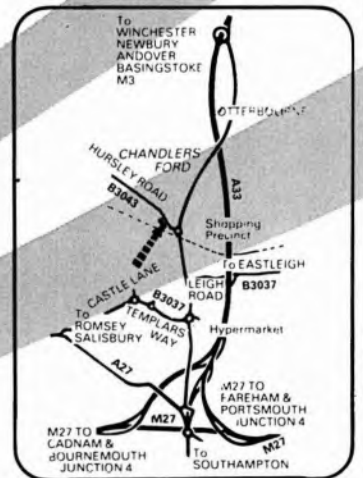
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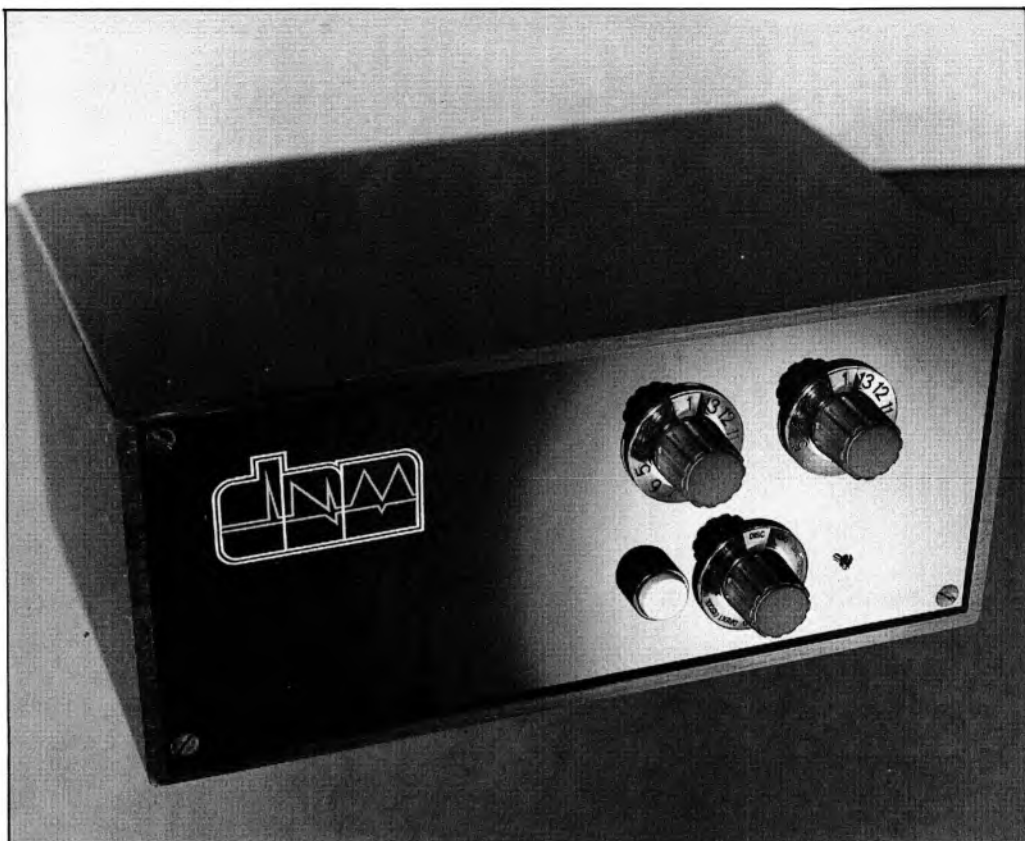
complete isolation between the electrical analogue of oil and water even with two box players, as a moment's consideration will confirm.

One very telling point is to audition CD players that have a 'display off' switch, and notice the often quite dramatic improvements that result. What is happening here is that the display electronics are injecting ultra-high frequency signals into the audio range, perhaps by radiating like a radio transmitter, and perhaps also through the earth or other lines. This is all standard stuff that has been familiar to analogue designers for years, yet until recently hardly considered in relation to digital audio. I believe that this problem, whilst not all that important in itself, is symptomatic.

But things are slowly changing. The difference in sound quality between the best and the worst turntables can be very large in anyone's terms, and there is no doubt that with several of the cheaper systems all these things came together leaving compact disc with a decided edge. I am also in no doubt that the supposed superiority of some vinyl front-ends is a sham, that it results from 'lazy' signal processing by the record player that provides a warm, woolly and appealing sound that even quite ordinary amplifiers and speakers have no difficulty coping with. The sharper, cleaner CD sound produced in such systems may well drive the system electronics outside their area of competence.

SYSTEM SYNERGY

I'm not too concerned about whether you agree with my analysis of how things compare. You can make up your own minds according to your own tastes and circumstances. I merely want to show what kind of criteria are involved when putting systems together, and that components may well interact when put into systems in ways that are not immediately obvious. This brings us to the concept of system synergy, the idea that the elements in a system should co-operate, and that when things

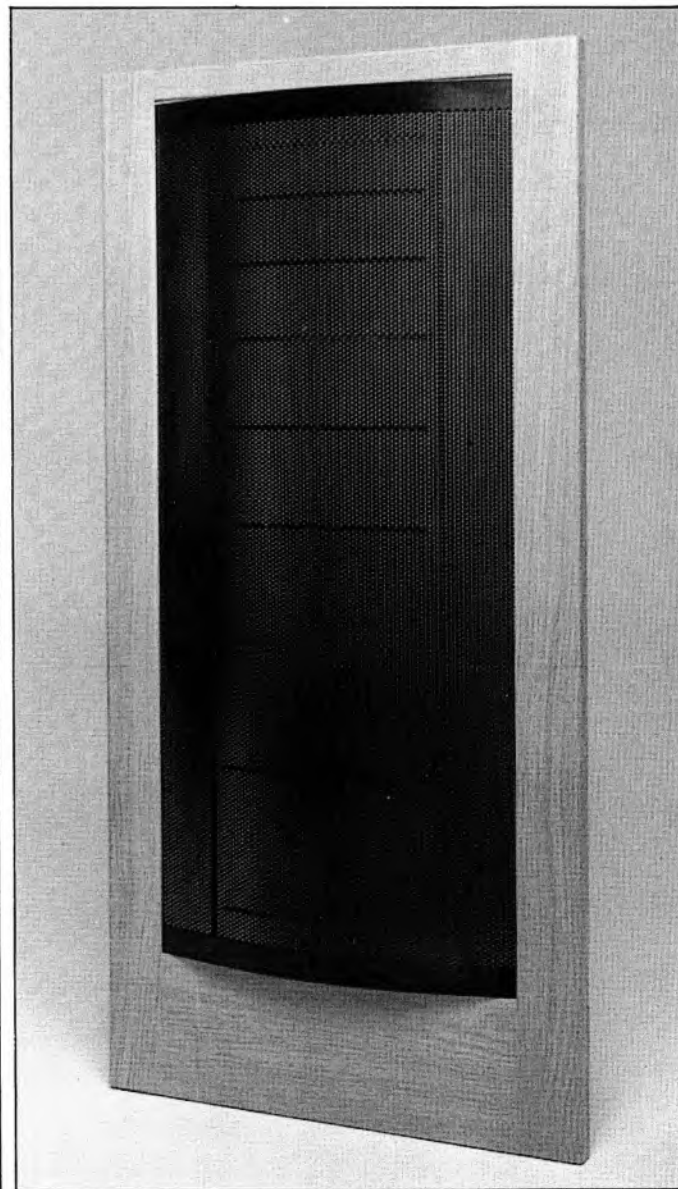


For the record: LNM 3 preamp and Martin Logan CLS II electrostatic loudspeakers used for reference in the system reviews.

are right, the net result may well be in some sense more than the sum of the individual components – and vice versa.

There are no easy rules to follow when putting systems together. It has been said that the source is the most important thing, but there's a logical fallacy in the statement, and there's no reason why any one component should be said to have any logical supremacy. I've tried to work through some of the arguments in the tests that follow. In each case they were set up and used in two separate average size but differently proportioned rooms, and in each case I used the cabling and speaker, and sometimes also the equipment, supports recommended.

I end this introduction with just one plea to those contemplating buying a system such as the ones reviewed here. It is to buy your *complete* system from *one* specialist dealer if you possibly can. A BADA dealer would be ideal, but in any case there should be an understanding that the dealer is responsible for the whole package, preferably up to the point of installation, and that he can cope with routine maintenance and servicing as required after the sale. Good listening!



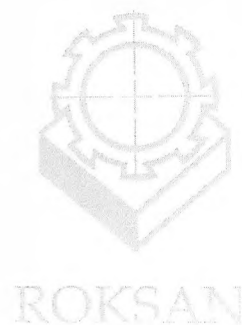
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This, folks, is our cheapest system. Costing about £20 less than £500 for a complete CD and record playing system (before cables and stands), it's well into one-make midi system territory, and turns out to be an effective advocate for the component approach to buying an audio system. In fact it's a hard act to improve at the price, though there is one way in which this can be done as will be explained later. It's also true to say that you won't be able to pare much off the price of this system without seriously imperilling sound quality.

ARISTON Q-DECK TURNTABLE

One of the two source components in our system is this artfully designed turntable, from Scottish manufacturer Ariston, which has come to be seen as the only natural competitor to the Dual 505/3. Having said this, the Thorens *TD280* package which I suppose you could say has similar pretensions is also available, and very attractively priced at £150. This must be giving Ariston a few sleepless nights, but then Ariston has caused some consternation in the Dual camp, and because of the other two, Thorens isn't exactly having everything its own way either . . .

Each of these turntables offers something

unusual – an underpinning purist design sensibly allied to a semi-automatic control system which takes the 'oh blow it' out of playing records. However, in one respect the Ariston is a little less sophisticated because the designer has not sought to integrate the arm and player completely. Thus although the arm lifts and the motor stops when the end of side is reached – triggered incidentally by a friction free, low torque device based on a magnetic switch – the arm cueing level remains in its lowered position for the next time.

Motor start-up is automatic as the arm is pulled towards the record, and speed selection (33 $\frac{1}{3}$ /45) is by a switch, strategically placed near the front of the player. This is not a mechanical speed change: the motor is driven by an oscillator circuit whose clock speeds can be changed to suit, and it's that circuit that the switch controls. The arm is a largely unimpressive OEM unit made in Japan, but is fitted with an excellent low cost freebie in the shape of the Audio Technica AT-95E cartridge, the uncrowned king of the freebies.

But the really impressive part of this deck is the motor unit itself. Although there's no suspension, the plinth is an impressively

solid Q-board sheet faced around the edge for cosmetic purposes. Q-board is a proprietary laminate with a rubberised core which provides very effective damping. The platter is a heavy one-piece alloy item, finely engineered, with an integral inner drive surface to which drive is transferred by belt from the synchronous motor. There's no shortage of fine, cost effective engineering here, and the appearance is much better than some home grown models. In the two years or so that it has been on sale, it has been a sustained hit, and early build and reliability problems have reportedly been solved.

TOSHIBA XR-9318 CD

The *XR-9318* is a simple, low cost CD player from Toshiba, the company that also supplies the loudspeakers for this system. Surprisingly, although Toshiba is a major Japanese manufacturer, and not just of audio equipment, the *XR-9318* is made for the company by Philips in Hasalt, Belgium, using Philips technology.

However, it doesn't use the 16-bit 4x oversampling Philips chip set we're so used to, but a non-oversampling variant, still with parallel conversion but with discrete brick-wall filtering at 44.1kHz. The player is also

very simply specified elsewhere, for example in the power supply, but it has an effectively suspended transport compatible with 8cm discs. The otherwise false feet have foam inserts giving a minimum of isolation.

The styling job is not exactly masterful. 'Mannered' might be a better description, and build quality has a definite tendency to flimsiness. This is not a player that could be accused of looking more expensive than it is. The display is pure old style Philips kitsch, capable of showing track and index numbers or timings, but not simultaneously. Memory play (of up to 20 tracks) and repeat modes are added to the usual track skip and scan modes, and a fixed level headphone socket is available. Even with this very low level of provision, I'd guess the Toshiba still has more facilities than most people will ever use, the writer included.

ROTEL RA-810A AMPLIFIER

The Rotel *RA-810A* is a neatly executed black box whose native design radicalism is not exactly in danger of frightening the horses. Sorry, I mean it's an ordinary amplifier, at least on the face of it, whose only stand out feature is the price. The Rotel *RA-810A* is perhaps the least expensive serious hi-fi amplifier available, remarkably costing £20 less than the *NAD3020*. The usual explanation for the good showing of Rotel products applies here too: it achieves its 'least expensive' tag largely by being manufactured in Taiwan and it is 'serious' due to the fundamental soundness of the British design input. Having said this, I confess that to my ears the Rotel actually sounds more archetypally oriental than it does British, but please don't read into this anything I haven't said.

By modern standards the *RA-810A* has a reasonable minimum of inputs: phono (moving magnet only), CD, tuner and auxiliary, plus one tape circuit with a monitor facility. One pair of loudspeakers can be connected (via 4mm binding posts!) and the amp has a headphone socket. The only other controls are for bass, treble and balance. Presentation is neat and uncluttered, build quality is typical of what you would expect around £125, but this is OK because it costs £100.

TOSHIBA SS33M LOUDSPEAKERS

The original Toshiba *SS33* was something of an historical accident, but a happy one which allowed decent systems to be put together for an almost unprecedented low price. I can even claim an inadvertent hand in its genesis. It came about after a brainstorming session which followed a particularly harsh verdict I gave to the speakers supplied with one of Toshiba's systems.

The result was a cheap but large box, built to the lowest standards consistent with decent sound quality and with none of the usual concessions to rack system technology and aesthetics – gaudy fluted grilles over non-existent tweeters, etc. It was eventually replaced by a refined version of the same thing in a slightly smaller box, the latter chosen for superior bass control. That, folks, is the *SS33M*.

It's cheap, and as we shall see it's also quite wonderful, though the price has crept up to only about £10 below the starting price for other good (though smaller) speakers. Still, £10 is a whole lot better than a kick in the butt. The snag, and it is one, is that to find a

single dealership that flogs Ariston, Rotel and Toshiba is something of a tall order, though I've no doubt any of the three manufacturers will try to supply suitable names if asked. Unfortunately Toshiba generally doesn't sell through specialist outlets because the *SS33M* is about the limit of its high fidelity components range, more's the pity.

The speaker itself holds few surprises except, as suggested earlier, that it's still an awful lot of box for the money, the practical consequences of which are that it offers an almost unprecedented level of bass grunt per pound. The bass unit and tweeter are proper hi-fi units, made by Tonagen in Japan, and the boxes are assembled here in the UK, though whether by a loudspeaker manufacturer for its expertise, or a kitchen unit supplier for its unit pricing is not clear.

There are few other concessions to luxury. The grille cover frames are unrebated and the terminal block is a simple spring type designed for bared wires only, though fortuitously or otherwise it is possible to ram in 4mm plugs quite satisfactorily without ruining the sockets. The 'black ash' effect finish is strictly utilitarian.

SOUND QUALITY

Progress of compact disc technology is such as to make a nonsense of received wisdom, sometimes within surprisingly short time scales. A year or so ago, the Toshiba CD player would have looked like insanely good value for money. It costs just £150, yet on the whole it sounds crisp and incisive, and it has a smoother treble than many, and this would once have been enough to ensure endorsement. But in the time that the Toshiba has been on sale, Marantz has introduced its own budget giant killer in the shape of the *CD583* (see elsewhere in this issue), and it didn't take long to discover that the Marantz is a significantly better sounding player.

The Toshiba has two limitations that are highlighted by this comparison. First and foremost, it has a rounded off quality, especially at the high frequency end which sounds lacking in 'air' and misses whole layers of high frequency background detail. Via the Marantz, percussion sounded much more full of incident and brightly lit. Female voice also sounded closer and more articulate – and incidentally less sibilant. The

other difference is best explained as a loss of image scale and compression of depth information of music when played through the Toshiba. This is an area where the Marantz happens to excel. As there are no compensating disadvantages to the Marantz (by way of features, pricing etc), the conclusion is as obvious as it must be unpalatable to Toshiba itself.

Turning elsewhere, some readers may be aware that I am on record as being a fan of the *SS33M*, but it's a long time since I heard a pair, and auditory memory retention being what it is, I wasn't quite sure what to expect. In the event, I found that I recognised much of what I heard – but by no means all of it. The *SS33M* has a surprisingly sweet, articulate quality and is very smooth and well behaved, especially through the middle and treble frequencies. The smooth, expressive nature of the design makes it uncommonly easy to integrate into systems that otherwise sound harsh or bright, which to an extent is the case here.

The Rotel can sound a bit thin and raw in some combinations, but the Toshiba *SS33M* civilises it beautifully, yet allows detail full rein and expression. In one way, however, the *SS33* was a little disappointing. It is definitely a bit flaccid in the deep bass, tending towards blandness at slightly higher frequencies – the upper bass – with some loss of presence in the midband too. I attempted to control the bass by turning the amplifier bass control down, but this had virtually no beneficial effect at all, which eventually I decided was because the problem I perceived was a resonant one, and not simply a matter of level. Pulling the speakers well away from the rear and side walls and placing them on fairly tall stands didn't solve matters either, but did help.

The rather dry quality of the CD player probably did its bit to help too, yet the turntable, which is full and potent when the music calls for it, failed to provoke the rest of the system into misbehaviour. In the event, the best results I obtained from this system were from vinyl – not just because the CD player wasn't the best around, but because the Ariston *Q-deck* is at least potentially such a strong (probably the strongest) performer in its class.

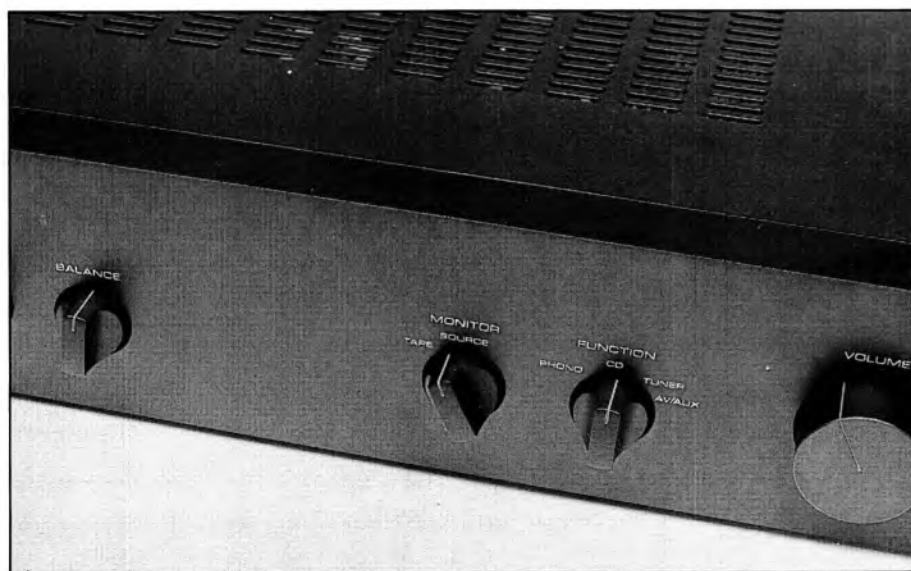
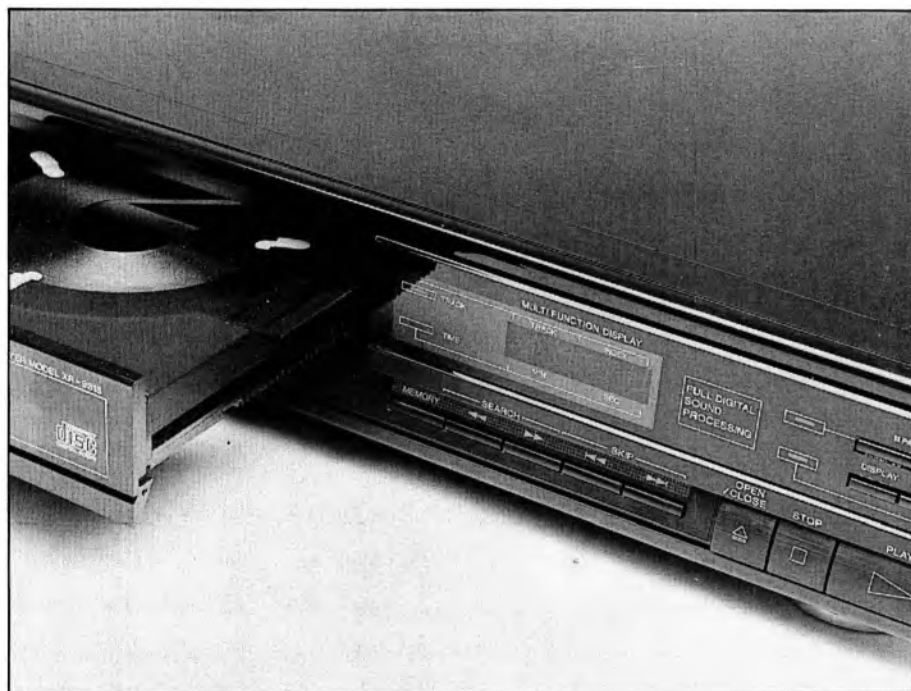
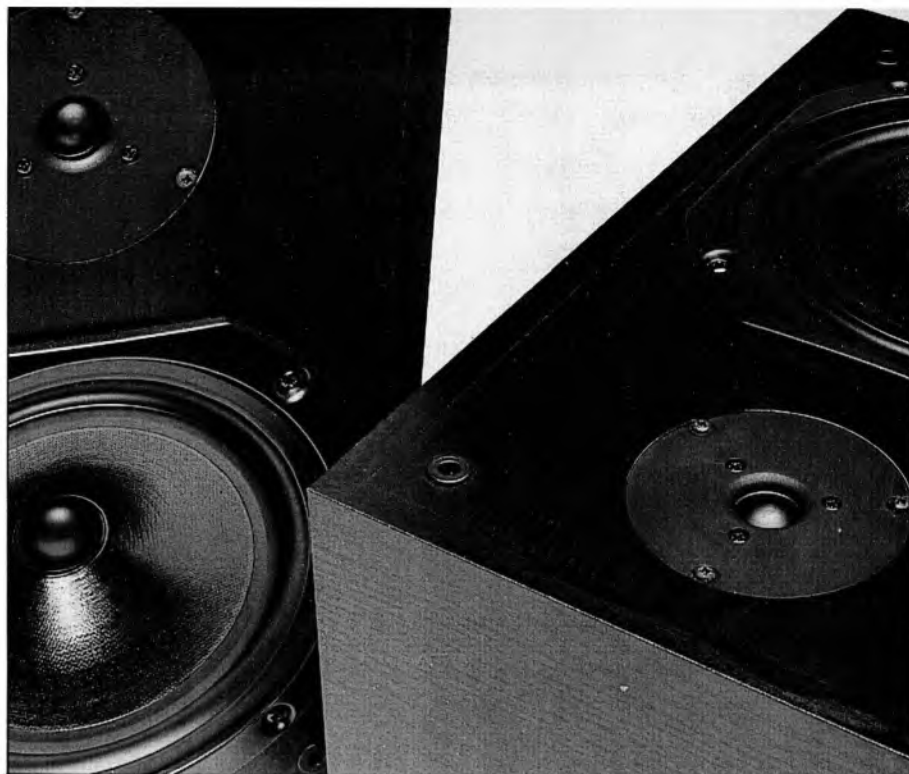
It is important however to use the Ariston on a rigid, preferably lightweight supporting



table or shelf. If it is free to move, it can become rather microphonic at very low frequencies, and the *SS33M*'s lack of absolute control in the bass will combine to seriously erode definition and control. However, as long as this single precaution is taken, the system sings. Record reproduction is colourful, the bass is rich, the tonal range is wide and stereo reproduction is spacious and good. This system may not be the last word in precision or dynamics, but what do you want for two groats and a kiss?

CONCLUSIONS

The bottom line is that this is a relatively unfussy system which can be set up easily in a wide variety of situations, and which doesn't respond too drastically to the minutia of setting up. In other words, it's not a fussy system, which makes it a good first time proposition, especially for the non-hobbyist who just wants a modestly good, fuss free system for the pure enjoyment of music. The only improvement I would wholeheartedly advocate is a change from the Toshiba *XR-9318* CD player to the equivalent Marantz, the *CD583*, which is comprehensively better.



If that change is made, you'll have a system which is perhaps a little more approachable from vinyl than it is off CD, but which has real musical integrity in both cases. The slightly more expensive Dual/Marantz/HK/JPW system featured in this issue is more exacting in many ways, and gets closer to the core of the music, especially when it becomes more sophisticated and complex. But this one takes the award for approachability. It is an attractive sounding system in every sense.

GENERAL DATA

TYPICAL RETAIL PRICES INC VAT

Ariston <i>Q-deck</i> inc cartridge	£149
Toshiba <i>XR-9318</i>	£150
Rotel <i>RA-810A</i>	£100
Toshiba <i>SS33M</i>	£90
Total (ex stands, cables etc)	£489

TURNTABLE

Type	belt drive, semi-auto
Speeds	33 $\frac{1}{3}$ /45
Cartridge	Audio Technica MM
Dimensions	13 x 42 x 34/7cm (h x w x d)/overhang

CD PLAYER

Digital output	no
Headphone output	yes
Dimensions	36 x 30.5 x 8.5cm (h x w x d)

AMPLIFIER

Power output	20wpc
MC cartridge compatible?	no
No. of inputs (ex tape)	4
No. of tape circuits	1
Dimensions	9 x 44.5 x 28cm (h x w x d)

LOUDSPEAKERS

Type	sealed, 2 way
Recommended placement	open, stands
Impedance	8 ohms
Sensitivity	86dB/watt/mtr
Power handling	60 watts
Dimensions	40 x 26 x 21.5cm (h x w x d)

Ariston Acoustics Ltd., Freeport Scotland, Prestwick Airport, Scotland KA9 2RB. Tel: (0292) 76933.
 Toshiba UK Ltd., Toshiba House, Frimley Road, Frimley, Camberley, Surrey GU16 5JJ. Tel: (0276) 62222.
 Rotel Hi-Fi, 25 Heathfield, Stacey Bushes, Milton Keynes MK12 6HR. Tel: (0908) 317707.

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£550 SYSTEM

DUAL TURNTABLE, MARANTZ CD, HARMAN KARDON AMPLIFIER, JPW LOUSPEAKERS.



This is the second cheapest of the ten systems covered in these tests, and it represents as catholic a selection of components as any of them. There are old standards (the Dual *CS505/3* turntable especially), an old also-ran that has been updated to interesting effect (the Harman Kardon *PM635i* music amplifying engine), something quite new and unexpected (the JPW *Sonata*), and a ridiculous bargain (the Marantz *CD 583* CD player). It turned out to be an intriguing and initially slightly uneven mixture, but eventually it settled down into a surprisingly distinguished groove.

Although all four main items are specialist high fidelity components in their own right, their retail distribution is not as tightly controlled as some. For anyone interested in taking it further, I'd guess the JPW will be the hardest item to locate, and therefore the one to find first. There's a good chance that the dealer will also stock the other items. The opposite is much less likely to be true.

DUAL CS505/3 TURNTABLE

The *CS505* has changed considerably since it was first introduced. There was a time when it was rather tackily built, but in its current *Mk 3* guise, kitted out with its 'Audiophile

Concept' badge (!) it's finally housed in a plinth that does it justice, and makes at least a token concession in the direction of good build quality. The plinth has a wood veneered outer section of genuinely excellent appearance, but it has to be said that much of the rest of the deck represents the triumph of clever dick design over engineering prowess. But isn't that the very essence of cost effectiveness?

The Dual isn't just any ol' roundabout – it's different. The arm is a low mass design with gimbal bearings, with tracking force and bias applied by spring rather than gravity, meaning it is effectively immune even to quite major levelling errors. Combined with the spring suspension, which helps isolate the system from shocks and feedback, you have a turntable that ought to be more or less immune to anything but the grossest environmental conditions, and which works consistently in a wide range of systems. Well that's the idea.

The drive system consists of a vestigial plastic sub-platter driven by flat belt from a 16 pole synchronous motor whose pulley is segmented, grapefruit fashion, and can be opened and closed to provide a variable speed facility of a few per cent either side of

the nominal 33 and 45rpm. The subplatter is topped by a lightweight one piece item, and is topped by a plain rubber mat. All the moving bits so far described are fitted to a pressed steel top plate, and spring decoupled from the aforementioned plinth.

The headshell, factory fitted with a Dual branded cartridge which appears to have been derived from the Ortofon *OM10*, is made of carbon fibre and is reasonably rigid. But the very slender armtube means that, potentially at least, there is some torsional movement in the system.

The control system is also unusual, and makes the player about as goof-proof as you can get this side of fully automatic. The platter switch is activated by moving the arm towards the record. The hydraulic lift/lower device is interlinked with the player in such a way that the arm lifts and the motor stops at the end of side, leaving the cueing lever set to 'up' the next time the deck is used. Now *that's* cookin' . . .

MARANTZ CD583 CD PLAYER

First impression of the Marantz *CD583* is that it's just like every other £200 CD player, but it isn't – quite. It has a little gimmick that makes it irresistible, as we shall see. Mean-

while, get a load of this. The Marantz is equipped with a display capable of showing track and index numbers side by side with elapsed track timings. Play facilities include audible cueing, track skip, random play, intro-scan, programming for up to 20 tracks, repeat and – that's it for play facilities. The unit also has a fixed level headphone socket.

The Marantz is a Philips clone, and uses the 16-bit twin channel TLA1541 'A' grade improved linearity convertor and the latest 4x oversampling digital 126 order (I think) SAA7220PB low ripple filter. The loading drawer accepts 8cm discs as well as proper ones. The player is well finished and simply built, obviously down to a price but without excessive signs of skimping. A good £200 worth as I say, the only notable omission being remote control. I mentioned that the CD583 has a gimmick, and it does. This £200 CD playing machine costs £150. Gee!

HARMAN KARDON PM635i AMPLIFIER

Originally the amplifying core of this attractive little system was to have been that most eponymous of budget esoterica, the NAD3020. In the end, for whatever reason, NAD couldn't or wouldn't deliver, so we replaced it with a sample of the recently updated Harman/Kardon PM635, now identified by the 'i' suffix.

What can I tell you about it? Numero uno, it's an excellent substitute for the NAD. The two are probably the most prominent 'full features' integrated amplifiers at their respective prices (NAD – £120, H/K – £160), apart that is from the Rotel RA-816A which happens to feature in another review in this issue. And these three are amongst the very few amplifiers of their type with any real audiophile street cred. However, the PM635 is 50 per cent more powerful than the NAD (or the Rotel) at 30 watts/channel with a new found higher output current capability to help it deal more effectively with real life loudspeakers. The extra cost also reflects in a rather better grade of build and finish, both inside and out.

The Harman Kardon does have one immediately obvious failing. In use, I found it somewhat counter-intuitive because it has too many similar looking controls. Flanked by the mains on/off switch and headphone socket on the left, and the outsize volume control on the right, there are no less than six similar looking controls to cover the usual selection and housekeeping functions. There are rotary controls with central indents for the bass, treble and balance. The inputs are selected by another control, various tape monitoring and dubbing operations are selected with the next. Finally, there's a switch dedicated to loudspeaker selection.

The number of items that can be plugged into the HK is by no means excessive for an amplifier that might be asked to earn its keep as part of an extended audio/visual system, though a second tape circuit has been added to the current version. Tape apart, you get a moving magnet phono input and just three line inputs, arbitrarily labelled tuner, CD and video. Of course there's no reason why one (or even both) of the tape circuits shouldn't be hijacked for use as line inputs. The monitor switch allows either tape to be monitored, and for recordings to be dubbed

from Tape 1 to Tape 2.

Balance, treble, bass – these are self explanatory, and there's little to be said about loudspeaker switching except that two pairs can be connected and switched independently or together. The switch also has an 'off' position rather than the more usual headphone cut out.

The control count, and other details like the bare wire screw loudspeaker terminals (replacing much poorer spring terminals), point to the fact that the PM635i was never planned as a purist product. Indeed much the same can be said of the Dual CS-505 turntable. Purist (I hate the word, but you know what I mean) turntables lack accoutrements like variable speed and auto-return, but the Dual has both of these because the model was derived from a line that had been aimed at the general user on a budget. Thus we have a system that's beginning to show a user friendly orientation.

JPW SONATA LOUSPEAKERS

JPW's Sonata is the new low cost model from this small but by all accounts successful West Country outfit. The Sonata is electrically conventional in that the enclosure is quite compact and designed for near-wall use on tall stands. The drive unit complement consists of an Audax small cone/dome tweeter (or copy) and a 120mm paper pulp bass driver from Elac. The crossover and terminal pad are standard too.

However, the box certainly isn't standard. It consists, surely uniquely at this price level, of a surprisingly solid enclosure extremely finely finished in real wood veneers on all surfaces. The surface treatment is a deep gloss, and the natural wood finish (as opposed to the alternative black finish) really is something special. The box is made from a better than average grade (by visual examination) of MDF and the joints have an unusual interlocked structure for strength.

JPW makes a stand for the Sonata, a lightweight design made with square section steel tubing and spiked on the top and the tripod base. These were included in the test programme, but not to the exclusion of others.

SOUND QUALITY

Originally the system was set up with the Dual turntable sat on an IKEA equipment support. The main qualities of this currently

fashionable equipment support which started life as a coffee table are that (a) it's cheap, and (b) it prevents the equipment falling to the floor. Beyond this, it's hard to say much positive about it. In this system at least the Dual simply failed to behave properly at first, and it took a move to a light-weight wall mounted shelf before the bass lost its rather messy, sloppily paced quality.

In fact the system took quite a lot of detailed work before it really performed adequately. In no way is this the kind of system you just plug in and go. I found that it has an almost excessively analytical quality, that the loudspeakers demand first rate stands, preferably a tall, heavy pillar type, and that the cables used in this system are particularly important.

The system has unusually high levels of resolution, and a cheap grotty interconnect between the CD player and amplifier can and will add a subtle layer of grunge to the sound. I favour solid core loudspeaker cables (Mission in this case) which compared to stranded stock tends to train the system in the right direction, whilst taming a slight tendency to edginess. Aside from these things, this system benefits inordinately by simply making sure all the equipment supports are as structurally sound as possible, and all connections are tight and clean. Finally, the set-up needs to be 'burnt in' for about two days and nights, and the amplifier and CD should be switched on for a couple of hours before being used seriously. Genuflections towards the East are optional but are preferred...

However I found all this effort more than worthwhile. The system came alive to an extraordinary extent and ended up with a sharp, penetrating quality. Dynamics are tightly defined, the bass is deep, lean but unmistakable in its intent, and the mid has tremendous authority and presence. The treble isn't wonderful, but many of the setting up steps have the effect of partially ameliorating any problems in this region.

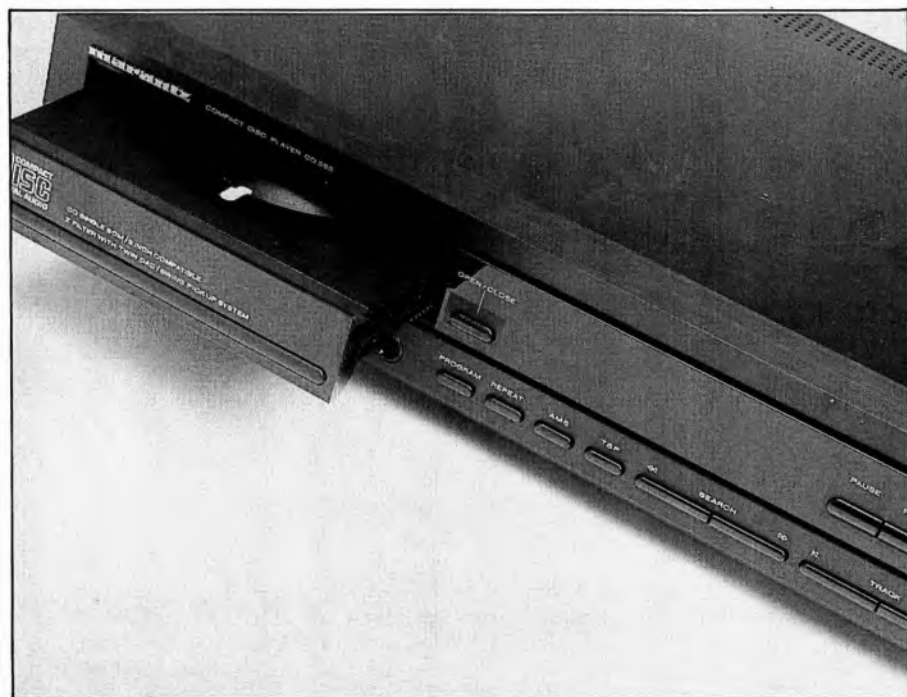
If there is a weakness here, it lies with the Dual which to my complete surprise was comprehensively outperformed by the Marantz CD player, which without doubt is extraordinarily talented for the price. It's not just that the Marantz offers a more sharply defined bass, an absence of extraneous noise and high standards of clarity, which is



nothing less than should be expected. No, the Marantz was also superior in more subtle areas like timing, pitch, the sense of 'pulse' that is so integral to good rock recordings (eg Joni Mitchell's *Hejira* or John Martyn's *One World*), and the depth and scale that is characteristic of the best classical recordings (eg various of Britten's Snape recordings on Decca and Boult's old Vaughan Williams symphonies on EMI).

CONCLUSIONS

The Marantz *CD583* is nothing less than exceptional at the price, and as far as sound quality goes it would be exceptional at twice the price – and this is *not* hyperbole, just a simple statement of fact as I see it. I am not an ounce less enthusiastic about the JPW *Sonatas* which both look good and also have the kind of solidity and resolution that will leave a few jaws hanging in amazement when the price becomes known. The only caveats are that the Marantz lacks remote control, and the JPW demands the greatest care about the systems that are erected around it. In this system the Harman Kardon provides an essentially neutral platform, one that



offers a sufficiency (but not surfeit) of power, excellent control and definition, and a real feeling that it is in command.

My declared slight sense of disappointment with the Dual must be seen in the context of the excellence of the system as a whole which only really sang with the CD player, a finding that would certainly have been reversed with comparable components a couple of years ago. Well it shows the way the wind is blowing.

GENERAL DATA

TYPICAL RETAIL PRICES INC. VAT	
Dual <i>CS505/3</i> inc cartridge	£140
Marantz <i>CD583</i>	£150
Harman Kardon <i>PM635i</i>	£159
JPW <i>Sonata</i>	£100
Total (ex stands, cables etc)	£549
TURNTABLE	
Type	belt drive, semi-auto
Speeds	33 $\frac{1}{3}$ /45 plus variable
Cartridge	included, MM
Dimensions	40 x 43.5 x 37/3cm (h x w x d)/overhang
CD PLAYER	
Digital output	no
Headphone output	yes
Dimensions	8.5 x 36 x 31cm (h x w x d)
AMPLIFIER	
Power output	30wpc
MC cartridge compatible?	no
No. of inputs (ex tape)	4
No. of tape circuits	2
Dimensions	10.5 x 44.4 x 35cm (h x w x d)
LOUDSPEAKERS	
Type	2 way, sealed
Recommended placement	near wall
Impedance	8 ohms
Sensitivity	87dB/watt/mtr
Power handling	70 watts approx
Dimensions	32 x 23 x 21.5cm (h x w x d)

Hayden Labs Ltd., Hayden House, Chiltern Hill, Chalfont St. Peter, Bucks SL9 9EW. Tel: (0753) 888447.
 Marantz Audio (UK) Ltd., 15-16 Saxon Way Ind Est., Moor Lane, Harmondsworth, Middx UB7 0LW. Tel: (01) 897 6633
 Harman (Audio) UK Ltd., Mill Street, Slough, Berks SL2 5DD. Tel: (0753) 76911.
 JPW Loudspeakers Ltd., Unit 1, Richmond Walk, Plymouth, Devon PL1 4LL. Tel: (0752) 607000.

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ADF270	85.99	---	---	---
ADF370	109.99	---	---	---
ADR460	104.99	---	---	---
ADR470	129.99	---	---	---
ADF680	259.99	---	---	---
ADNX505	112.99	---	---	---
ADWX707	154.99	---	---	---
ADWX908	249.99	24.99	12.50	18
ADWX909	344.99	---	---	---
XK007	344.99	---	---	---
XK009	489.99	---	---	---
B&W LOUSPEAKERS				
DM550	148.99	14.99	5.58	24
DM560	198.99	19.99	7.46	24
DM570	248.99	24.99	9.33	24
DM580	398.99	39.99	14.96	24
CM1	344.99	34.99	12.92	24
CM2	894.99	89.99	33.54	24
MATRIX	594.99	59.99	22.29	24
GRUNDIG FINE ARTS SYSTEM				
SYSTEM 1	1469.99	146.99	55.13	24
GOODMANS LOUSPEAKERS				
MAXIM 11	69.99	---	---	---
MISSION LOUSPEAKERS				
761	99.99	9.99	7.50	12
762	149.99	14.99	11.25	12
763	229.99	22.99	17.25	12
MORDAUNT SHORT AMPLIFIER				
MSA500	349.99	34.99	13.13	24
MORDAUNT SHORT LOUSPEAKERS				
MS10	89.99	8.99	4.50	18
MS15	114.99	11.99	5.72	18
MS25	139.99	13.99	7.00	18
MS35	159.99	15.99	8.00	18
MS45	229.99	22.99	8.63	24
MS55	309.99	30.99	11.63	24
MS100	189.99	18.99	7.13	24
SYSTEM 442	1149.99	114.99	43.13	24
NAKAMICHI RECEIVERS				
SR2	369.99	---	---	---
SR3	429.99	---	---	---
SR4 REMOTE	559.99	---	---	---
NAKAMICHI COMPACT DISC PLAYERS				
OMS1	329.99	---	---	---
OMS4 EXDEMO	699.99	---	---	---
OMS7	1999.99	199.99	75.00	24
NAKAMICHI CASSETTE DECKS				
NAKAMICHI CASSETTE DECK 24 MONTHS INTEREST FREE CREDIT				
CR1	344.99	---	---	---

MODEL	PRICE	DEPOSIT	MONTHLY PAYMENTS	TERM
CR2	394.99	---	---	---
CR3	594.99	---	---	---
CR4	744.99	---	---	---
CR5	994.99	---	---	---
CR7	1499.99	---	---	---
DRAGON	1749.99	---	---	---
PIONEER HI-FI SEPARATES				
CT110 CASS DECK	59.99	---	---	---
GR870 GRAPHIC	49.99	---	---	---
PDM500 C.D.	199.99	---	---	---
PDM700 C.D.	299.99	---	---	---
SA770 AMP	59.99	---	---	---
SKV200 RECEIVER	79.99	---	---	---
TX1070 TUNER	49.99	---	---	---
SONY COMPACT HI-FI SYSTEMS				
1000 C.D.	1229.99	---	---	---
SONY COMPACT DISC PLAYERS				
CDPM47	149.99	14.99	11.25	12
CDPM55	155.99	---	---	---
CDPM75	189.99	---	---	---
CDPM77	199.99	19.99	15.00	12
CDPM95	229.99	---	---	---
CDPM97	249.99	24.99	18.75	12
CDPM50M	204.99	---	---	---
CDP470	149.99	14.99	11.25	12
CDP550	164.99	---	---	---
CDP770	199.99	19.99	15.00	12
CDP970	299.99	29.99	15.00	18
CDPC100	399.99	39.99	20.00	18
DDP227ES	399.99	---	---	---
DDP557ES	999.99	99.99	37.50	24
CDPR1/DAS R1	499.99	49.99	187.50	24
SONY CASSETTE DECKS				
TCX150	79.99	---	---	---
TCRX50	149.99	---	---	---
TCRX60ES	249.99	24.99	9.38	24
TCRX80ES	349.99	34.99	13.13	24
TCX700ES	499.99	49.99	18.75	24
TCW300	124.99	---	---	---
WMD60	249.99	24.99	18.75	12
SONY AMPLIFIERS				
TAF300	149.99	---	---	---
TAF400	199.99	19.99	7.50	24
TAF450ES	249.99	24.97	9.37	24
TAF500ES	349.99	34.99	13.12	24
TAF700ES	499.99	49.99	18.75	24
SONY TUNERS				
STS100	84.99	---	---	---
STS300	114.99	---	---	---
STS444 MK11 ES	249.99	24.99	9.37	24
STS500 ES	199.99	19.99	7.50	24
STS700 ES	299.99	29.99	11.25	24

MODEL	PRICE	DEPOSIT	MONTHLY PAYMENTS	TERM
TECHNICS COMPACT DISC PLAYERS				
SLP202	169.99	16.99	12.75	12
SLP222	209.99	20.99	15.75	12
SLP333	239.99	23.99	18.00	12
SLP550	259.99	---	---	---
SLP555	279.99	27.99	21.00	12
SLP600	339.99	---	---	---
SLP777	339.99	33.99	17.00	18
SLP900	389.99	---	---	---
SLP999	439.99	43.99	22.00	18
SLPN25	144.99	14.99	10.83	12
SLPN45	214.99	---	---	---
SLXP6	219.99	21.99	16.50	12
SLFN20	179.99	17.99	13.50	12
TECHNICS CASSETTE DECKS				
RSB355	119.99	---	---	---
RSB505	139.99	---	---	---
RSB608	189.99	---	---	---
RST130	112.99	---	---	---
RST230	139.99	---	---	---
RST333	199.99	---	---	---
RSTR255	149.99	14.99	11.25	12
RSTR355	234.99	23.99	17.58	12
TECHNICS AMPLIFIERS				
SU600	99.99	9.99	7.50	12
SUR800	119.99	11.99	12.00	12
SUV450	149.99	14.99	7.50	18
SUV550	199.99	19.99	10.00	18
SUV650	249.99	24.99	12.28	18
SUV900	459.99	45.99	17.25	24
TECHNICS TUNERS				
ST600	99.99	9.99	7.50	12
ST6450	144.99	14.99	10.83	12
ST670	199.99	19.99	10.00	18
ST690	309.99	30.99	11.63	24
TECHNICS RECEIVERS				
SA180	119.99	---	---	---
SAR210R	199.99	---	---	---
WHARFEDALE LOUSPEAKERS				
DELTA 30	75.99	7.99	6.00	12
DELTA 50	99.99	9.99	7.50	12
DELTA 70	149.99	14.99	7.50	18
DELTA 90	199.99	19.99	7.50	24
DIAMOND III	99.99	9.99	7.50	12
DIAMOND SUPER	139.99	13.99	7.00	18
DIAMOND RITZ	149.99	14.99	7.50	18
504 2	139.99	13.99	7.00	18
505 2	169.99	16.99	8.50	18
507 2	199.99	19.99	7.50	24
510 2	299.99	29.99	11.25	24
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£750 SYSTEM

MOTH TURNTABLE & ARM/GRADO CARTRIDGE, PHILIPS CD, ARCAM AMPLIFIER, MISSION LOUDSPEAKERS.



With this system we're beginning to move away from the strict budget end of the market, and into what might be described, mixing metaphors furiously, as the foothills of the middle ground. The step upwards is related to quality rather than quantity, as a quick flick through the vital statistics like power output, the size and power of the engine and so forth shows.

MOTH TURNTABLE & ARM/ GRADO ZTE+1

"Moth turntables are simple devices" starts the instructions for this turntable, promisingly I thought. Much of the cost of this system resides in the turntable and arm, and simple, if it's intelligently engineered, is very much what is required.

The deck bears little obvious resemblance to the original bearer of the name, which I confess is now no more than a fading memory. I do remember a couple of the key features though, one being the Medite platter (its incongruity helped it stick in the mind), and another, the very fetching bright red synthetic drive belt. But other features are new – for example the meandering groove that divides the main chassis into two.

The *Moth* chassis comes in three main

components, all wood veneered in a rather dour black woodgrain in the case of the review machine. One consists of nothing more than a plain Medite sheet the same width and depth as the player itself. This component acts as a support for the two other components which together constitute the top two thirds of the plinth. The larger front part is a solid section which encompasses the main platter bearing and the arm; it is coupled to the base via three spikes which bear on screw heads fixed to the base itself. The other part is also solid and acts as a support and mechanical 'earth' to the synchronous motor. This plinth section is stiffly but resiliently coupled to the base. There is no direct physical coupling between the two plinth top sections, which helps decouple motor vibration.

The platter bearing consists of a narrow diameter inverted shaft running in a sleeved alloy bush fastened to the centre of the thick and very accurately engineered Medite platter. The motor has a twin diameter pulley and speed change is effected by moving the belt from one pulley diameter to the other. The rocker on/off switch for the motor is fixed adjacent to the motor, at the back. You will have realised by now that the Moth turntable is manual in operation, assisted

only by the cueing lever.

By now the arm should need little introduction. The Moth arm of course is the Rega *RB250* by another name, which in turn is the low cost version of the *RB300*, with a simpler counterweight assembly and bearings. This arm has a simple beam structure with a gravity balance system, with no attempt at dynamic balancing and a slightly higher (but still acceptable for all but the most compliant cartridges) effective mass figure. The bearings are still of good quality however, the spring bias force adjustment is identical to that used in the *RB300* and the arm is still based on the same one piece casting from the top of the headshell to a point behind the main bearings. And it is still astonishing value for the money – £78.

The cartridge is one of the extensive and once ubiquitous Grado family, which it must be said are difficult to tell apart. As usual, the secret is to screw it in and *never* remove the stylus. It will not sound as good again if you do.

PHILIPS CD582 CD PLAYER

I once dreamed up the ultimate method of getting to sleep (or was it just a nightmare?): counting different models of Philips CD players. I know I'm not alone in finding its range

confusing, and the rapidity with which models are junked in favour of new ones is simply bewildering. Whilst I am in a complaining mood, I cannot say I go a bundle on the appearance of its cheap players, though I have to admit there has been an improvement over the years, and the pricing is an adequate recompense.

What does constantly astonish and delight me however is the consistency with which Philips (and Marantz) manage to wring more and more from what is beginning to sound like a tired old formula – the *TDA1541* 16-bit twin DAC, 4x oversampling, digital filters and so on. The tracking performance of Philips CD players is equally astonishing, and hardly matched, still less bettered elsewhere – at any price. Well, it just shows how much stretch there was in the basic technology.

This current showcase for Philips expertise is a full width player offering basic facilities and remote control. It is, I suppose, the nearest thing to a bread and butter model in the range – if I've read the others correctly.

The *CD582* is fitted with Philips' latest drawer mechanism which accepts 8cm discs as standard. Those used to old style Philips players will find that disc handling is smooth and discreet. The display is large, attractive and clear, and not as cluttered as some of its rivals. The information presented included the current track number and elapsed time, with a few minor functional readouts (play, pause etc) as well. Facilities are equally straightforward, the list running to audible cueing, track skip, programming, repeat and shuffle play. There's a headphone socket too but no volume control. On the back there are system interface sockets which don't concern us here and the usual analogue outputs. There is no digital output, which is the only facility I might miss.

The remote control is barely larger than palm size, and can address most of the major features of the player apart from programming.

ARCAM ALPHA II AMPLIFIER

The makers of this amplifier are a taciturn, publicity shy lot, forever changing the company name (A&R, A&R Cambridge, Arcam, A&Rcam . . .), presumably to preclude the chance that anyone will actually remember what the company's called. It is therefore probably a severe embarrassment to the makers that the Alpha has been so consistently successful from the day it was introduced. The Arcam *Alpha II* is a competently designed, finely built product which has collected industry awards too.

Early versions of the *Alpha* suffered at least two distinct failings. One, the amp used a frame transformer instead of a torroid like most British competitors; this and the small case design led to excessive hum on the phono input. The change to a torroid, and later a larger case, cured this, and incidentally led to an improvement in sound quality. All things being equal, doughnut shaped transformers sound better.

The descriptive part of the Arcam story is pretty boring I'm afraid. The front of the amp is populated by a row of press button and rotary controls, and provides just about everything you could reasonably need, plus bass and treble controls which are sensibly restricted in operating range so as to not unduly affect the midband. The source selec-

tor switches between phono and three line inputs, whilst a switch nearby provides tape monitoring. Outputs are available for headphones and one pair of speakers which can be wired via the headphone socket cutout switch or direct, using alternative sets of 4mm sockets at the rear.

The only other provision not immediately obvious is an internal connector for an optional input board for low output MCs. Making this an optional extra was an excellent move in my view, eliminating one important source of compromise. Power output of the Arcam is 30 watts/channel, and build quality is excellent, using screwed together flat panels instead of bent tin. Even so the lid, and perhaps other panels, would benefit from being damped.

MISSION 761 LOUDSPEAKERS

One look at this speaker readied for action and with the grille covers removed, and you'll have one of the following two reactions. Either you'll rush over to turn them the right way up, or you'll realise they're from Mission and that they are therefore supposed to have the tweeter below the bass driver.

The *761* is the cheapest of the new Mission range of loudspeakers, replacing both the *70* and the *700*. The upside down treatment of the front baffle is designed to allow correct phase integration around the crossover region from the listening position, and also helps distribute room resonant modes caused by rear wall and floor reflections. The sealed enclosure is compact but far from small, and although the modest pricing doesn't allow for bracing or other expensive construction techniques, the woodwork is based on a fine grade of thick (18mm) chipboard – Medite in the case of the baffle – and the enclosures are quite heavy and rigid by the standards of their peers.

The bass and midrange are handled by a Mission designed and built 180mm unit with a doped paper pulp cone. The tweeter is a small and apparently good quality dome. The two are married by a simple but not minimalist crossover, and wired through to a 4mm binding post terminal block on the rear. Cosmetics are good, though the budget doesn't stretch to real wood veneers.

SOUND QUALITY

This is one of those systems where a clear

distinction must be drawn between the performance of the system from records and from compact discs. I enjoyed this system immensely, especially with compact disc which offered strong dynamics and a quality standard roughly comparable to the Marantz *CD583* player which is used in another of our systems. It sounds sharp, alive, refined and detailed beyond its price, and it suits the system brilliantly.

Turning to records, the first problems noted were with the cartridge. The Grado has rather high compliance and very limited clearance above the record. Even with the tracking force reduced below the ideal 2gms-ish the cartridge often fouled the raised record edge lip. There was even the odd clonk in the middle of records that were not optically flat. Aside from this purely physical problem, I found the cartridge sounded rather coarse and sibilant, with a compressed, dulled tonal range. There were signs of the familiar Grado style vitality and dynamics lurking somewhere, but the other problems weighed it down.

So a change of cartridge was called for; I cut my losses and switched to the familiar charms of the Audio Technica *AT95E*, though something more superior, for example a Linn *K9*, should be better still in a system of this calibre. I also used a thin felt mat on the bare platter. Without clamp, label recess or a dish-platter profile, record contact is almost arbitrary, the audible consequence of which are a lightened, rather untidy sound.

The changes showed record reproduction in a different light. The combination of turntable and arm appears to be a happy one. They pull together symbiotically, the combination sounding powerful and lucid, with a surprising depth of bass and a wide and vibrant tonal dynamic range. There was a minor speed problem with the *Moth* however, which made itself apparent as a shakiness of tone and pitch, especially with recordings of solo piano. The problem wasn't always audible, and with many kinds of music it remained firmly hidden. But I suspect that it may have been responsible for one finding that was totally consistent: a mild but noticeable blurring or defocusing of transients which detracted from dynamics and pace. Through all this however, stereo imagery was surprisingly coherent and large in scale.

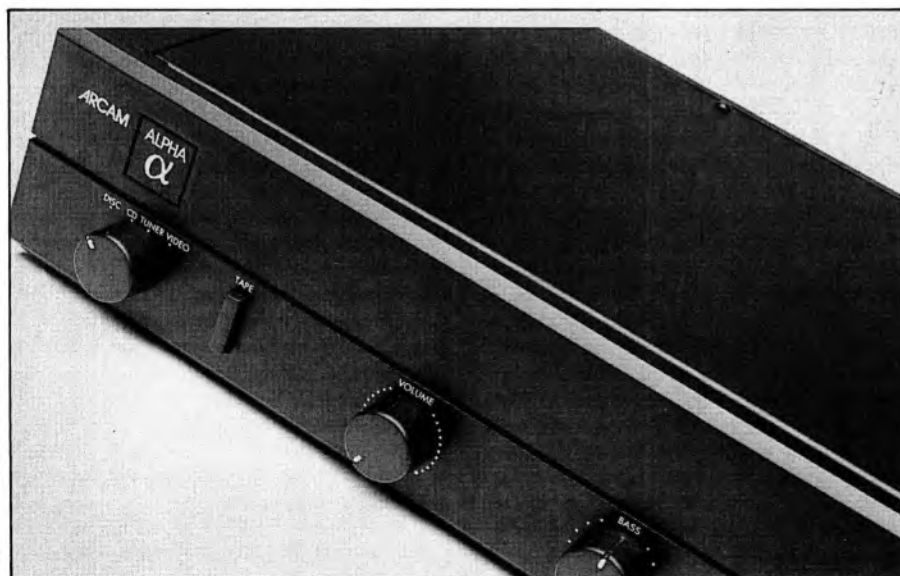
Scale is a useful word when trying to



describe this system, it's a quality it possesses in abundance, whether driven by records or by compact disc, and is partly a function of the excellent Mission 761 speakers, which if anything sound better than an earlier pair I heard some time ago. The Missions are very much the consummate budget speaker, and in typical house fashion the 761 sounds big, bold and crisply detailed. The Arcam Alpha can be similarly described as an ideal budget amplifier with an emphasis in this case on refinement, warmth and consistency. The two together make a particularly excellent match, the amplifier's relatively subtle strengths minimising a leaning in the Mission towards hardness and brightness.

CONCLUSIONS

First impressions when using the CD player are that the system fills the listening room well – there's none of the 'smallness' that epitomises many low cost systems – yet image specificity is excellent and the level of detail resolution is high. It's an impressive, sometimes heady and always enjoyable combination. The record deck was tantalisingly good. With a better cartridge installed, the



Moth did certain things the CD player could only hint at, including providing an impression of depth and weight that I found extremely alluring. But merely to tantalise is not quite enough, and the *Moth* needs some further development before it can be fully endorsed.

GENERAL DATA

TYPICAL RETAIL PRICES INC VAT	
<i>Moth/Moth arm/Grado ZTE+1</i>	£176/£78/£22.50
Philips CD582	£200
Arcam Alpha II	£160
Mission 761	£120
Total (ex stands, cables etc)	£756.50

TURNTABLE	
Type	belt drive, manual
Speeds	33 $\frac{1}{3}$ /45
Cartridge	Grado ZTE+1
Dimensions	15 x 46 x 35/7cm (h x w x d)/overhang
CD PLAYER	
Digital output	no
Headphone output	yes
Dimensions	8.5 x 42 x 28cm (h x w x d)
AMPLIFIER	
Power output	30wpc
MC cartridge compatible?	no*
No. of inputs (ex tape)	4
No. of tape circuits	1
Dimensions: pre	9 x 43 x 22cm (h x w x d)
*see text	
LOUDSPEAKERS	
Type	sealed, 2 way
Recommended placement	near wall
Impedance	7 ohms
Sensitivity	87dB/watt/mtr
Power handling	70 watts approx
Dimensions	38 x 21 x 21cm (h x w x d)

Moth Marketing, 47 Armstrong Close, Wilstead, Beds.
 Tel: (0234) 741152.
 Philips Electrical Ltd., City House, 420-430 London Rd., Croydon,
 Surrey CR9 3QR. Tel: (01) 689 2166.
 A&R Cambridge Ltd., Denny End Ind. Centre, Waterbeach, Cambridge
 CB5 9PB. Tel: (0223) 861550.
 Mission Electronics, Stonehill, Huntingdon, Cambs PE18 6ED.
 Tel: (0480) 52777.

“Ladies and Gentlemen, We Have a Winner”



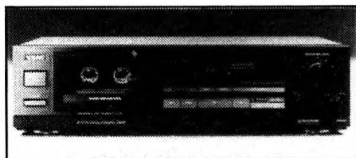
The TEAC V-570 cassette deck has been well received by consumers and press alike. In a Supertest of tape decks in the December issue of What HiFi, the V-570 came out on top against seven other cassette decks. Here are some of the comments made by What HiFi.

“I was able to make some very fine recordings on this deck, which very quickly claimed a top slot in this group of eight. Sound quality was exceptionally firm and precise, with good dynamics and real stereo presence. It was also surprisingly subtle, dynamics being strong but never forced, while quiet passages were reproduced with surprising clarity.”

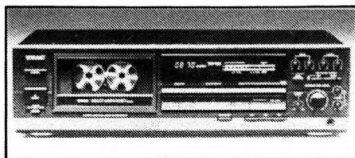
“The TEAC deck proved a strikingly lucid and natural music maker. It rarely intruded on the sound, either by losing information or dynamics, or by sounding synthetic. It has to be a first choice for those who put sound quality above all else.”

“There’s no questioning the very high standard of subtlety and finesse this deck achieved during the course of these listening tests. Ladies and gentlemen, we have a winner.”

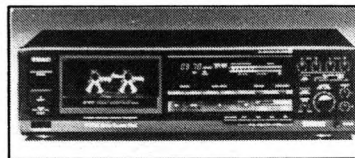
What HiFi—December 1988



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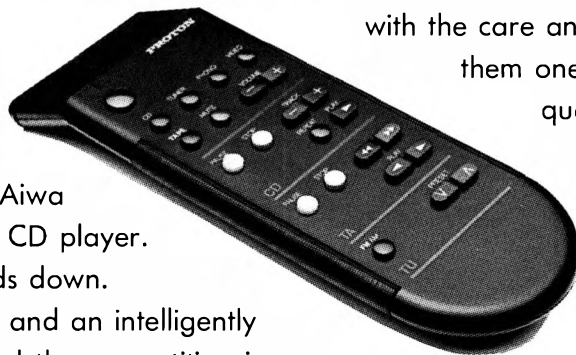
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MICHELL/NAGAOKA TURNTABLE COMBO, KENWOOD CD, MUSICAL FIDELITY AMPLIFIER, WHARFEDALE LOUDSPEAKERS.



There are hi-fi systems and hi-fi systems. Some of them impose themselves on domestic surrounds, making themselves as welcome as a wasp around ice cream. Others have at least a suggestion of style, though these are few and far between, and most of them are called Bang & Olufsen. For better or for worse this system is no B&O, but it is one of the few with style. Or would be if the CD player was left to one side. Well you can't have everything . . .

MICHELL SYNCRO TURNTABLE/ SYNCRO ARM/MP11 BORON

This elegant perspex and aluminium creation is a real head turner, especially with the felt mat removed. Recognising this, Michell suggests putting away the mat with the records at the end of a session. Howzat for getting your priorities in order?

The original version of the *Syncro* had a moulded lid with smoothly rounded corners and edges, and was an even more startling looker than it is now. Apparently there were so many quality problems with the lid, which was about the only bought-in component, that the decision was made to bring manufacture in-house. The current version then has a squared shape-off just like other turn-

tables, but in recompense the lid is now a more solid, less resonant item. In any case, it would take a lot more than a rectangular cover to make the *Syncro* look ordinary. Much more.

Drive is by belt from a synchronous motor, whilst the moving bits are suspended on three coil springs positioned equidistant from each other under the platter rim. The subchassis itself is a startling looking alloy spoked wheel the same diameter as the platter. A ring shaped outrigger attached to the main subchassis component supports a replaceable perspex arm base component, which is available in various fittings. The shrouded synchronous motor with dual diameter pulley and on/off switch is attached to the base. The platter, a glass disc with a bevelled edge, is rim driven by round section belt.

The test turntable was supplied in its most popular configuration fitted with the *Syncro* arm, which like the Moth arm fitted to another of our test turntables in this review is neither more nor less than a Rega *RB250*. A brief description of this arm appears in the Moth/Philips/Arcam/Mission system review.

For this test we chose a well established and well liked middle price moving magnet cartridge, the Nagaoka *MP11 Boron*, a

refined version of a basically conventional design that successfully anticipated some of the current emphasis on structural integrity.

KENWOOD DP-5010 CD PLAYER

This model was not chosen on the basis of track record; it is newly introduced, so new that no instructions were available. In essence the *5010* is an updated version of the *DP-880SG*. For those familiar with that model the main changes are a larger random access keypad (20 tracks can be accessed directly; it used to be ten) and the old 4x digital oversampling filter has been replaced by an 8x filter, still operating with 16-bit quantisation.

There are two key items of technological interest. One has already been mentioned – the 8x oversampling filter, the advantages of which are gentler, less obtrusive anti-aliasing filtering. The other is called DPAC which realigns the digital data signal with a master clock accurately synchronised to the DAC's own master clock. It's a process which reduces what Kenwood describes as 'jitter' and which in Kenwood demonstrations sounds subtly like the kind of roughness and loss of fine detail that analogue flutter is responsible for in cassette decks and turntables.

Some attention has been given to areas

like damping the casing, and the deck is also fitted with shock absorbing feet. On the features front the unit is conventionally over endowed. For example the display is an all singing type that includes a calendar style track display, whilst play facilities include auto-space, a volume control on one of the two analogue outputs (accessible using the remote control) and an auto editing function in which you specify the tape length, and the deck pauses when each side has been filled. There is no display off switch, which is a potentially significant omission given the complexity of the display.

MUSICAL FIDELITY A1 AMPLIFIER

The *A1* is a one off. There never has been anything quite like it, and there isn't now from any other source. Like many of Musical Fidelity's extensive amplifier range, there has been a conscious attempt to realise the best qualities of a valve amplifier circuit using transistors, and in the *A1* this means using an output stage that is biased deeply into Class A (not the Japanese sliding bias Class A which is quite a different thing). An important consequence of this is that the amplifier's temperature runs within an inch of legality, practicality and common sense. The fluted top plate has a large thermal capacity and acts as the main heat sink for the amp. It's important not to leave records or compact discs on top, unless you want them to turn out like waffles. The circuit is also individualistic, much of the unit's sophistication residing in the regulator stages.

Features are typical of an audiophile amp. There are no tone controls, filters or any other such junk, not even a balance control or headphone socket. What you get is a clean, stripped down user interface limited to volume control, source switching and tape monitoring, and on the rear a switch to change the phono input between MM and MC settings. There are five input circuits in total – phono, tape and three line inputs.

Like the Michell *Symcro* but in its own quite individual way, the *A1* is an aesthetic sensation. For my money it's the best piece of integrated amplifier visual design since the Cambridge Audio *P40*, which is saying a lot, the only possible exception being the Mission Cyrus range. However, one respect in which the *A1* has always been open to criticism is in the general standard of fit and finish. There was always a lot of metalwork in an *A1*, but it sometimes looked a little scruffy. This is the case no longer. The fixing screws in the top plate have been retained – a major redesign would have been needed to get rid of them – but the fluted lid is now in one piece instead of two, and the various seams and joins are as neat as they come. The control layout is also a model of ergonomic good sense, and could scarcely be bettered. It's ironic to record that the *A1*'s highly individual looks have probably lost it more customers than it has won . .

WHARFEDALE 505.2 LOUDSPEAKERS

There was much dark muttering in the trade and not a little real anger recently when Wharfedale was pipped to the winning post of a 'Loudspeaker of the Year' award in a natio-

nal event. This was far from being the only bizarre decision that night. Suffice it to say that the *505.2* is a loudspeaker that has earned the respect of its competitors and is achieving some much deserved commercial success. 'Ah yes, but do I like it?' I hear you ask. You'll just have to read on to find out . . .

The *505.2* is a sophisticated product. Outwardly it looks like any ordinary 8 inch two-way in an unprepossessing sealed box which is designed to sit on stands away from walls. However, the tweeter is a high tech metal dome, and the bass driver a flared polymer cone unit, the latter assembled using Wharfedale's high accuracy build ring technique. Both units are secured to the baffle by another Wharfedale innovation: a unique bayonet fixing process which gives an unprecedentedly good join, though a special tool is needed to remove the drivers if service is needed.

The enclosure itself is built from thick 18mm chip and MDF panels, and is stiffened by internal bracing and a third piece of practical technology popularly attributed to the Leeds based firm, the 'Wharfedale Tray' side extension at the rear. Finish is A1, and assessed simply as a lump of hardware, the *505.2* looks very attractively priced.

SOUND QUALITY

Like most of the less expensive systems, this one can be counted a success. It's one of those systems where each and every one of the components is a strong performer in its own right, and is well suited to working with the others. If I say that despite this the system still didn't have quite the homogeneity of the very best, I must also qualify this by saying that there were occasions with this system when it proved capable of weaving spells. Not always, not even all that often, but sometimes.

Much of the character in this system comes from the loudspeakers, which prove to be extremely interesting components. The first and most obvious point is that they are sharp and exciting. They're a little bright too, but for once the sharpness isn't a by-product of brightness, but something much more intrinsic. It's the midband that provides the clarity, and I would argue that the greatest achievement of Wharfedale's engineers when they were teasing this one out of the woodwork is that they managed to design a bass

driver that has such excellent transient response and control in the all important midband.

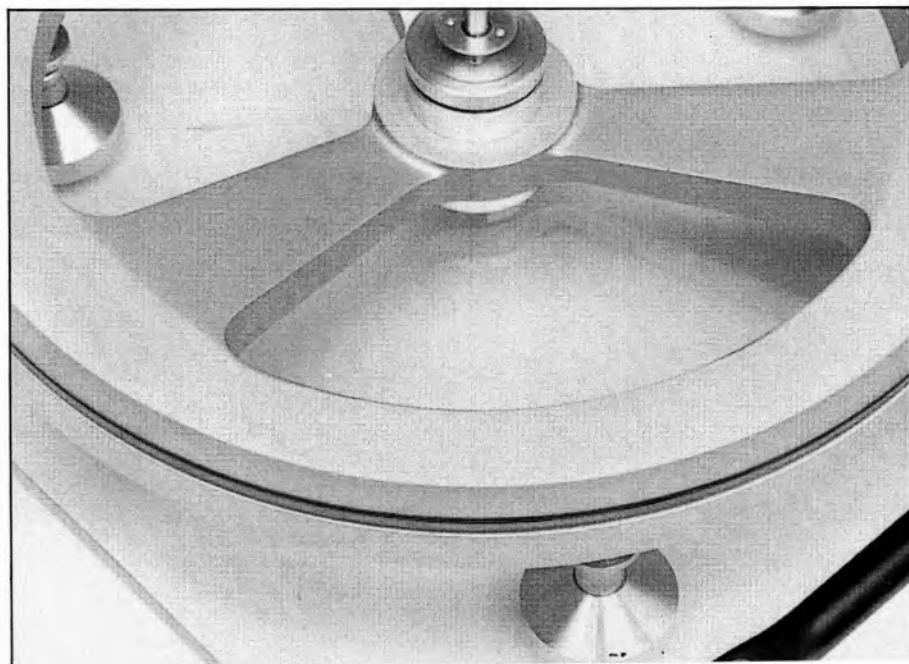
It's not just the midband that deserves praise though. Although it doesn't have the solidity and warmth of some loudspeakers, the bass is extremely well integrated and again is very quick. The Wharfedale is precise almost to the point of sounding abrupt with some material, but the amount of detail it pulls off records and discs is much greater than you'd expect of a loudspeaker at the price. Inevitably though there's a price to pay for all this ability. Although quite smooth sounding, there's an occasional touch of boxiness, as though to confirm where the sound is coming from. There will be those who label this system as a little lightweight and thin.

The Musical Fidelity *A1* is on tremendous form. I detect no great improvement in the last year or so except that the amp seems to have lost some of its sensitivity to certain electrically unfavourable loads, and the amp also seems subtly less coloured. The little Musical Fidelity has a touch of warmth missing from the Wharfedales, and this helps remove any tendency to sterility that the speakers can display in other combinations.

The *A1* also has a surprisingly good phono stage which came into its own with the Michell/Rega/Nagaoka combination. The Michell has what might be described as a personable character. Stereo imagery is good, the treble is clean but a little restrained, and dynamics and expressiveness are strong points. The bass end is good too, but not *as* good. There's a suggestion of plumpness here, a slight blurring of transient edges and 'pulling' of pitch, whilst an odd mild ringing quality becomes apparent at very high volumes.

Our other source component is the Kenwood CD player, which turned out to be well above average for the price. As part of the test programme I compared it directly to some of the players used in other systems in the group, including the two Sony players, the Pioneer and the Philips. The Kenwood's only competition came from the excellent Philips, but the Kenwood wins hands down for build quality. Comparisons aside, it sounded solid, detailed and refined, with notably explicit stereo soundstaging.

I tried a number of ideas in an attempt to

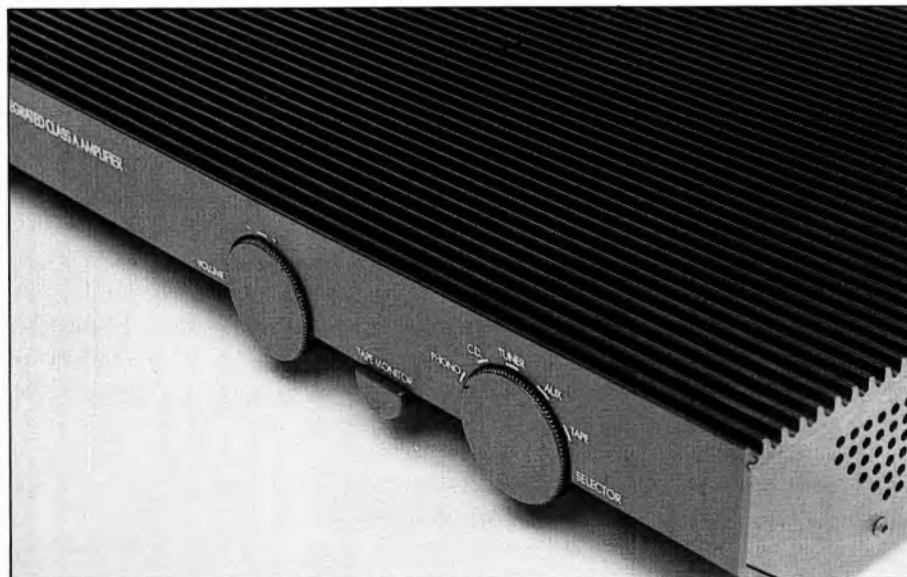


wring more from the basic system without demolishing it entirely and starting from scratch. I found a way too, but it's hardly a panacea since it involves removing the turntable and CD player and replacing them by better ones. The practicalities of the situation are that this means something like a Linn, a Roksan or a Pink turntable, and perhaps the Marantz CD85 CD player, which pushes the cost up inordinately.

The problem with this system when compared to the most synergistic examples at similar prices is that the amplifier and loudspeakers have unusually high levels of resolution, and they cover up nothing. The turntable and the CD player are very good components of their type, but it can be argued that despite this they're still not quite good enough.

CONCLUSIONS

Although I tried very hard, it is not easy to pick holes in this attractive and capable system. It can be argued, and I have done so, that its most positive quality can occasionally get it into trouble, that is to say its resolving power is great enough to show up failings that are necessarily a part of any modestly



priced system. To this extent the system could be described as a tad out of balance. I have to say though, that the practical consequences of this deficiency rarely made themselves obvious, and my final conclusion about this system is that it's one of the most satisfying of the ten in relation to price. It is good value, and it makes good music. If I was in the market for a system at this price level, I would certainly have it on my shortlist.

GENERAL DATA

TYPICAL RETAIL PRICES INC VAT

Michell <i>Syncro/Syncro arm/Nagaoka MP11 Boron</i>	£329 (tt + arm), £38 (cart)
Kenwood <i>DP-5010</i>	£244
Musical Fidelity <i>A1</i>	£269
Wharfedale <i>505.2</i>	£170
Total (ex stands, cables etc)	£1,050

TURNTABLE

Type	belt drive, manual
Speeds	33 $\frac{1}{3}$ /45
Cartridge	none as standard
Dimensions	15 x 46.5 x 36/8cm (h x w x d)/overhang

CD PLAYER

Digital output	electrical
Headphone output	none
Dimensions	11 x 44 x 31cm (h x w x d)

AMPLIFIER

Power output	20wpc
MC cartridge compatible?	yes
No. of inputs (ex tape)	4
No. of tape circuits	1
Dimensions	6.5 x 41 x 25cm (h x w x d)

LOUDSPEAKERS

Type	sealed, 2 way
Recommended placement	open, stands
Impedance	6 ohms
Sensitivity	86dB/watt/mtr
Power handling	80 watts approx
Dimensions	44 x 25.5 x 25cm (h x w x d)

Michell Engineering, 2 Theobald St., Borehamwood, Herts WD6 4SE. Tel: (01) 953 0771.

Path Group PLC, Desborough Ind. Park, Desborough Park Rd., High Wycombe, Bucks HP12 3BG. Tel: (0494) 459981.

Kenwood Trio UK Ltd., 17 Bristol Rd., The Metropolitan Centre, Greenford, Middx UB6 8UP. Tel: (01) 575 6030.

Musical Fidelity Ltd., Unit 16, Olympic Trading Estate, Fulton Road, Wembley, HA9 0ND. Tel: (01) 900 2866.

Wharfedale Loudspeakers Ltd., Sandeas Way, Crossgates, Leeds LS15 8AL. Tel: (0532) 601222.



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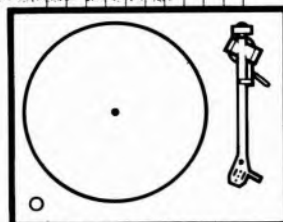
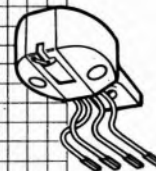
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£1,350 SYSTEM

MANTICORE MANTRA/AUDIO TECHNICA TURNTABLE COMBO, PIONEER CD, MISSION AMPLIFIER, MUSICAL FIDELITY LOUSPEAKERS.



The Manticore *Mantra* has been available for about four years, and in that time has been refined in some minor and not so minor ways whilst remaining true to its original brief, which I have always read to be a poor man's Linn *Sondek*, Linn *Axis* notwithstanding. Of course, neither company will thank me for saying so.

For this test, we've teamed the *Mantra* combination with a simple CD player from one of the better houses – Pioneer – and the heavyweight Mission amp, the *Cyrus 2 Series II* (it really *is* heavy too, despite its lack of cubic inches). Loudspeakers are the well regarded *MC-2* from Musical Fidelity.

MANTICORE MANTRA TURNTABLE/MUSICIAN ARM & AUDIO TECHNICA AT-F5 CARTRIDGE

The *Mantra* is built into a high quality, though plainly styled, wood veneered box with a hardboard base and rubber feet. It is elegant in its simplicity and use of fine materials. No expense has been spared to ensure the finest finish at the price; not a penny has been spent on anything superfluous.

The *Mantra* is built around a three point suspension, with a reinforced subchassis bridge between platter bearing and armboard. The deck has a glass platter (there's a subplatter too which provides the belt drive surface) with a felt mat on top. A slow speed synchronous motor is mains driven in the supplied version, and has a chromed pulley with two diameters for the two running speeds. Speed change is manual.

Compared to early *Mantras*, I noticed an improvement in the appearance of the motor pulley (it's tempting but unsafe to assume that this is reflected in improved tolerances) and the replacement of the three screw heads which hold the platter clear of the subplatter by a raised metal ring, which looks a lot less hit and miss.

Manticore has had its ups and downs. In a fit of over-confidence Manticore recently purchased the ailing – no, ailed – Logic, a move that cost it dear in service problems, and probably customer loyalty as a result. I mean Logic customers from before the takeover of course, not *Mantra* customers.

The component that caused Manticore the greatest headaches of all was the Logic *Datum* arm, an arm I smugly recall describing as poorly made at the time. However, it

did give Manticore the kernel of a potentially good arm which has reached fruition in the *Musician*. The arm tube (this is not a one-piece design) and stainless steel counterweight are lathe turned by Manticore with other parts CRC turned by local companies. The bearings are said to be of the same ABEC hardness standard as the Rega *RB300* and the SME *Series IV*.

The arm is machined, anodised and polished producing a high grade finish quite unexpected in a £170 model. Arm wiring employs van den Hul cable, and full adjustment is available for azimuth, VTA and operation of the cueing device. The arm has an unmistakably fine feel and inspires confidence. But you'll need scales for setting tracking force, and the spring bias mechanism is also uncalibrated.

The cartridge chosen was an Audio Technica *AT-F3*, but AT slipped up and sent an *AT-F5* instead, and I resolved to keep quiet about it until it was too late to do anything about it. As anyone who has heard both will know, the *AT-F3* is a less impressive cartridge compared to the *AT-F5*, and this system definitely calls for the latter. For those who don't know it, the cartridge is a low output fixed stylus moving coil, small and well made, and

a great favourite in the budget MC market.

PIONEER PD-4300 CD PLAYER

I think I heard tell that a survey was conducted recently which showed that some 98 per cent of CD users only ever used the play and track skip keys of their CD players. If I dreamed it and there wasn't such a survey (I should point out that I don't normally dream hi-fi), there ought to have been, and it would certainly have given just these results. Not because the other facilities are hard to operate; in most cases they're not. It's just that they're practically all completely and utterly useless, not to mention a total waste of space.

This build up is by way of setting the scene for a nice simple Pioneer player with very few facilities apart from those that are strictly necessary. You still get 20 track programming, track skip, audible cueing, repeat and random play, but that's about it. The omissions that potentially could cause a certain amount of heartache are remote control, a digital output and a headphone socket. Of course, this level of provision means there's plenty of unoccupied space on the fascia, and with the usual Japanese reluctance to leave a square centimetre of fascia uncovered, the gaps are filled up with spurious legends like 'Digital Filter' and '20 step random access programme'. I don't know why Pioneer doesn't go full hog and just rent out the space to Coca Cola . . .

The display limits itself to showing track numbers and times, with alternative time displays available if required. There are also some transport function tell tales. The player itself is simply built with a low resonance honeycomb profile base, a high resonance wrap around lid, a well finished plastic fascia that will nevertheless fool nobody and – that's it. Technology includes 16-bit 4x oversampling, minuscule power supplies, and not a lot else. The 4300 is to be made available in black or bright metal finishes. No firm price had been set for the silver version at press time, but there will be a premium.

MISSION CYRUS 2 SERIES II AMPLIFIER

Despite marketing difficulties in some countries, Mission has stuck by its shoebox hi-fi concept, restricting itself to refining and improving the Cyrus range for the *Series II* designation. The PC boards have been relaid, component quality has been improved, and the old, rather tatty plastic case has been replaced by a superbly tooled cast alloy case with what appears to be a Nextel finish. The control layout has also been made more comprehensible, and the amp now has individual channel adjustment using a friction locked volume control.

The *Cyrus Two* has distinctly purist leanings. Facilities include one tape and three line inputs, plus both moving magnet and moving coil inputs, the MC one a fully dedicated circuit quite distinct from the MM circuit. The Mission has separate 'tape' and 'listen' source switching.

Since I first saw one of the new *Cyrus Twos* (viz: after the metal case was introduced), the rather sloppy push on/off switch has been replaced by a more positive lever switch, and the 3.5mm (!) headphone socket has disappeared entirely, presumably to make the output wiring simpler and more direct. The

amp is exceptionally well built, and shows a great deal of attention to detail – for example the power switching that leaves the preamp constantly powered. An outboard power supply (the PSX) can be added later, and is designed to further improve sound quality.

MUSICAL FIDELITY MC-2 LOUDSPEAKERS

If memory serves, this was the first Musical Fidelity brand loudspeaker, and was designed by one Martin Colloms who may be known to some readers. It is a medium size design best used on stands and well away from walls. Bass loading is by port which fires to the rear, helping eliminate audible side effects from this source.

The physical design of the *MC-2* is surprisingly sophisticated, or maybe just complicated depending on your point of view. The mirror image enclosures (the tweeters are slightly offset to spread diffraction effects) are built using 19mm chipboard stock throughout, and efforts to control the enclosure include inseting the rear panel, and the use of a surprising amount of bracing which acts on all six internal panels. The tweeter is the 30mm Elac metal dome with a mesh cover, whilst the 200mm bass unit has a flared plastic cone with a permeable centre cap and an inverted roll surround. The motor assembly is relatively modest and the chassis is pressed steel. The *MC-2* can be bi-wired. Finish is good despite the use of vinyl wrap coverings and the baffle has a detachable reticulated foam cover.

SOUND QUALITY

I received some surprises with this system, particularly from the speakers which didn't sound quite as I remembered. Their overall sweetness and smoothness, the easy sense of precision and the way they project an image well out of the boxes – all these things were exactly as I recalled.

But there was also an unfamiliar nasal quality apparent with some material, and the bass sounded looser than I had expected. I was also drawn to the sound of the tweeter, which has certainly changed since the early days. This is not a surprise, if only because there have been reliability problems entailing a certain amount of redesign. It now sounds a touch 'furry' in quality. Mid/top

integration is also suspect. Some phasiness was also noticeable with certain material. The practical consequences varied according to the recording, but typically the *MC-2* sounded very large scale but rather unfocused, or at least variable in the way images were focused. Piano reproduction was a little out of control, but woodwind and strings varied all the way between good and excellent, and vocal quality and intelligibility were always first class.

However, in contrast to the *MC-2* situation, the Mission Cyrus amplifier is *exactly* as I remember, only more so. It has never sounded in better shape, and although its characteristically lean, dry quality certainly won't appeal to all tastes – why should it? – the overall level of ability and consistency is so great that any complaints end up sounding like nit-picking. I'm not about to pick nits, especially as the shortcomings, such as they are, run complimentary to those of the Musical Fidelity *MC-2*. This is one of the factors in an equation, representing system synergy, whose sum is greater than the arithmetic sum of the parts.

Back to the amplifier. Even without the add-on PSX power supply, which would be an obvious way to upgrade this system in the future, the Mission Cyrus *Two* has a range of attributes which are almost unbeatable, though they do find echoes in other amplifier designs, not least some of the Musical Fidelity range. Be this as it may, the Mission is consistent between inputs, and across a wide operating dynamic range. It was one of the relatively few amplifiers in this project that maintained a sense of grip and concentration when the music being reproduced was at a low level. Too often the spell seems to dissipate in the quiet sections. The Cyrus is also strong in more obvious areas, and here I'd pick out for special mention the deep, taut bass, the articulate midband and a strongly propulsive ability on suitable material. The Mission based system as a whole displays exceptionally good timing.

I've rather glossed over the turntable, without meaning to do so. Its special strengths are more or less implicit in what I've already said, because most of it refers to music reproduced from black vinyl, but for the record (hah!) the player is just what I suggested in the introduction, a kind of cut down Linn. It doesn't have truly Linn scale

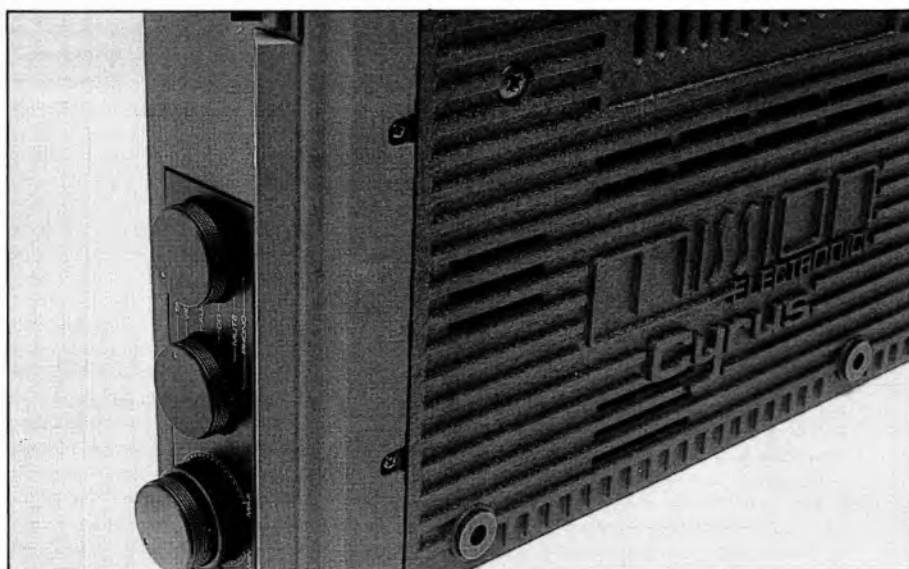


authority, bass weight or dynamics, but it is a very tidy player in each of these areas, never more so than with the *Musician* arm which is clearly an important middle market introduction in its own right. Low frequency pitch resolution is good and so is timing. The Audio Technica cartridge has a relatively low output and can sound a touch grainy at times, but it works well with the Mission's MC input and sits easily with the system as a whole.

The CD player I've left to last. It's an adequate, even quite good player which offers consistency and clarity every bit the equal of some of the more expensive players in this report. But it has a couple of weaknesses too. The *PD 4300* can sound a little flat during loud, heavily animated passages of music which is something the rest of the system successfully sidesteps. Finally, and again this point applies to more than just this player, the impression I take away from the Pioneer is that the output amplifiers are in some sense gutless, that they don't drive the system hard enough so when it goes *loud*, it also sounds *powerful*.

CONCLUSIONS

Another intriguing system, and a largely



successful one. The main change I would seek to make would be to the CD player, and I would be strongly tempted by another Pioneer, the *PD-91*. The *PD-4300* is a likeable enough player, and a purposeful one too, but it's simply out of its depth. The *MC-2*s don't seem to have entirely escaped the ravages of time – the speaker market is a moving target right now – but on the whole the good points still easily outweigh the bad.

This apart, this particular combination of equipment has high levels of resolution and timing, and a rather dry, and quite sophisticated style of delivery that may take a little adapting to, but which holds great musical rewards for the user.

GENERAL DATA

TYPICAL RETAIL PRICES INC VAT	
Manticore <i>Mantra/Musician/AT-F5</i>	£325/£170/£100
Pioneer <i>PD-4300</i>	£160
Mission <i>Cyrus Two Series II</i>	£300
Musical Fidelity <i>MC-2</i>	£299
Total (ex stands, cables etc)	£1,354

TURNTABLE	
Type	belt drive, manual
Speeds	33 $\frac{1}{3}$ /45
Cartridge	not as standard
Dimensions	13.5 x 46 x 38/8cm (h x w x d)/overhang
CD PLAYER	
Digital output	no
Headphone output	no
Dimensions	9 x 42 x 32cm (h x w x d)
AMPLIFIER	
Power output	50wpc
MC cartridge compatible?	yes
No. of inputs (ex tape)	4
No. of tape circuits	1
Dimensions	8.5 x 21.5 x 35cm (h x w x d)
LOUDSPEAKERS	
Type	2 way
Recommended placement	stands, open
Impedance	8 ohms
Sensitivity	90dB/watt/mtr
Power handling	100 watts approx
Dimensions	47.5 x 27.5 x 21cm (h x w x d)

Manticore Systems Eng. Ltd., The Courtyard, 56c Shortmead St., Biggleswade, Beds SG18 0AP. Tel: (0767) 318437.
 Audio Technica Ltd., Technica House, Lockwood Close, Leeds LS11 5UU. Tel: (0532) 771441.
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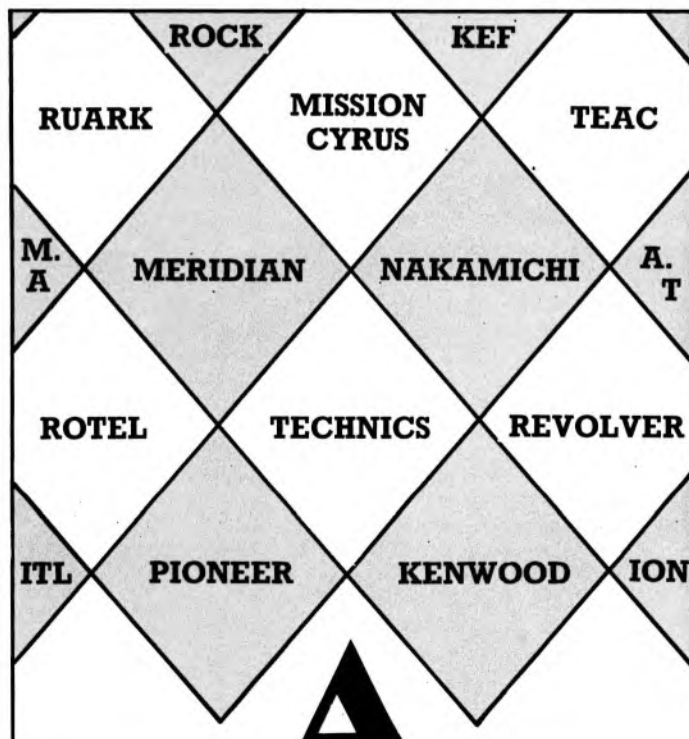
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SYSTEMDEK/GOLDRING TURNTABLE COMBO, SONY CD, AUDIO INNOVATIONS AMPLIFIER, SNELL LOUDSPEAKERS.



The first of our two valve powered systems uses what must surely be the lowest cost integrated valve amplifier available – the Audio Innovations Series 300. The loudspeakers are from Snell, a US manufacturer of very exactly crafted moving coil loudspeakers. The Systemdek is a classic middle market turntable with a deservedly good reputation, whilst the Sony CD player is a new, near budget model with an alarmingly long features list from one of the two companies that developed CD. And so, without further ado...

SYSTEMDEK IIXE TURNTABLE/ SYSTEMDEK ARM/GOLDRING 1020 CARTRIDGE

Dunlop, the Systemdek folk, used to do a nice line in affordable, radically styled turntables (they looked like up-ended gasometers; *high precision* up-ended gasometers) which had some success but which inevitably attracted a degree of criticism from certain members of the gelt-wielding community. The Systemdek II is the alternative: a more traditionally presented turntable that looks like 'wot a turntable orner'.

It's made in various versions, with or with-

out an external speed change/power supply module and/or arm. For this test we chose the top of the line IIXE which includes an electronic speed change/power supply. The deck was obtained with a Dunlop arm.

The IIXE employs classic ideas interpreted with care by craftsmen. It has a three point coil spring suspension with easily accessible adjustment points for levelling only on the player's top surface. The suspension has a low resonant frequency (estimated around 4Hz) and is almost completely undamped. The main bearing and arm are attached to a strong girder-like subchassis component, the arm via a curiously shaped Medite armboard which is interchangeable for compatibility purposes. The platter is a two-part affair, consisting of an inner hub and bearing assembly, the hub being fashioned from Medite. The main platter is a 1cm thick glass disc with a central plastic insert which makes a tight fit around the spindle. A thin felt mat sits on top.

The moving parts are housed within a conventional looking wood veneered box with a recessed wood veneered top plate. To my mind the lid is slightly disappointing – a not very well finished and rather shallow plastic moulding with friction hinges which fails to

hold the lid open securely unless it's almost fully open. The power supply is housed in a standalone box with a finish which matches (nearly matches in the case of the test sample) the player. It has an illuminated on/off switch and a 33 $\frac{1}{3}$ /45rpm toggle.

There's little to say about the arm. It has a substantial headshell with a locking collar which can be loosened for azimuth adjustments. The rest looks ordinary in design and execution, and is probably a standard off-the-shelf component. Tracking force is applied by weight, bias comes through hard experience (if you follow) and a spring. The bearings are okay.

Following the dictate that the most important part of any cartridge is the bit that scratches the plastic, the Goldring 1020 uses a van den Hul stylus, specifically the Type II profile which has a slightly relaxed specification and a little less fussy about setting up. There are three 1000 series models though, one of which has the more costly Type I van den Hul, and the other a 7 x 18 micron biradial. Any one of the three can be transformed into any other by simple stylus substitution. Stylus fit is tight and positive, and the cartridge seems physically strong though perhaps rather springy.

SONY CDP-770 CD PLAYER

The astonishing point about the CDP-770 is the profusion of facilities for a player costing only £200. This is the kind of comment I seem to be forever making, yet even on reflection it has never seemed more true. The player and remote control are blessed (if that's the right word) with a 20 track keypad, matched by a 20 track calendar style track readout which also spells out homely, largely redundant messages like 'no disc'.

There's a plethora of other rubbish too, examples of which include shuffle (random) play, features to help you edit discs onto tape, with 'professional' fades at the start and end of recordings, memory and repeat programming and more. There are some potentially useful features too. How about two analogue outputs, one controlled by a motorised rotary volume control (none of your cheap digital resistive ladder!) and an optical digital output besides. The Sony also has a headphone socket whose output is controlled by the same mechanical volume pot mentioned above. Discs of 8cm are accepted as well as 12cm discs.

But... the depth and range of facilities is scarcely matched by the standard of engineering which is about what you'd expect at the price.

AUDIO INNOVATIONS SERIES 300 AMPLIFIER

There's a cluster of hi-fi manufacturers centred on the Brighton area. Audio Innovations, which is headed by an ex-pat Dane who also imports Snell loudspeakers (amongst other lines) is just one. An enthusiast led outfit with very definite purist leanings, it has a 'philosophy' which has found expression in a number of valve amplifiers, of which this is currently the most accessible (to whit: the only one I can't quite afford. The others I can't afford at all).

The Series 300 is one of that rarest of all breeds – in fact this is the only one I've ever reviewed, or even heard – the integrated valve powered amplifier. It is a true Class A design and therefore produces a good deal of waste heat. Power output is a rated 10 watts/channel. If this doesn't sound a lot, most valve amps have a good track record of going louder than the numbers suggest. In any event, 10 watts is more than respectable for a valve amp costing £425.

You know when you see the Series 300 you've just come across something, well, different. How many other amplifiers do you know that are shaped at the top like a truncated pyramid? Or that have Perspex fronted fascias? The effect is curiously yet not inappropriately old fashioned. However, the amp doesn't feel all that solidly put together, and although on the whole it uses quite decent quality materials, build quality is distinctly below par. One example was the source selector which broke free (with some peripheral components) from its mooring, and very nearly caused the amp to be aborted from the tests. Of course at this price you'd expect almost any valve amplifier to be pretty, well, utilitarian, but not that it would be in danger of falling apart.

The Series 300 is well endowed with socketry. The moving magnet phono input has switchable input capacitance – there are

three line inputs, and two tape decks can be used, with source/tape monitoring.

Design highlights include passive phono equalisation, no negative feedback in the preamp, 'low' negative feedback in the power amp and an output circuit that obviates the need for bias adjustment. Components used include Noble conductive plastic film balance and volume control pots. Beyschlag metal film resistors plus a pair of custom output transformers, and 4mm binding posts are fitted for the loudspeaker connections. You can't select different output impedance taps with this amp, which is designed for loudspeakers of nominally 8ohms impedance.

SNELL TYPE K LOUDSPEAKERS

Buy a pair of Snell *Type Ks*, and you may come to wonder where the money went. The cost of £450 for a loudspeaker that looks like a five year old AR design costing £120? Who's kidding whom? But like all Snells, what's important is precisely what you don't see.

Whilst the *Type K* – Snell's baby – is based on classic, highly conservative fundamentals, the meticulous level of care that has gone into it is something else. The box is of modest size and wood veneered on all surfaces bar the baffle, which is painted black. There are two drive units, a small plastic dome tweeter, ferrofluid cooled and damped, and a 200mm pulp cone bass unit with a polymer surround. The two are mated by a complex crossover unit using computer grade polypropylene capacitors, air core chokes, and oxygen free wiring. Each and every loudspeaker is then hand adjusted under 'dynamic operating conditions' to as near perfectly approach the design alignment as possible.

The *Type K* is highly sensitive at 90dB/watt/meter, which is an important requirement when used with the low power Audio Innovations amplifier. There are bi-wire connections on the back which can be shorted together if the speaker is to be driven using a single pair of wires.

SOUND QUALITY

Audio Innovations supplied various accessories for use with the two systems built around its amps and Snell speakers. The most important were loudspeaker supports called *Pirate* stands. For the Snell *Type K* these are heavy twin column steel stands with flat plates on

the top and base, the latter capable of accepting spikes which were used for this test. The top plate cannot be spiked, and I used Blu-tack instead. The stands were filled with sand and lead, and were both heavy and inert. Nevertheless, they somehow manage to avoid looking ungainly. The stands cost £169.

Audio Innovations recommends heavy stranded cables for its valve amplifiers, and also supplied lengths of its *OR-200* Litz loudspeaker cable, which sells for £16 a metre or £96 for the two sets of 4mm plug terminated three metre leads supplied for review.

Cartridge installation using the high quality mounting hardware supplied was hindered a little by the shape of the cartridge body, but everything else about the turntable was a breeze. Optimum tracking force, as with the majority, is 1.8gms.

With the loudspeaker covers removed and bi-wired to the amp, the latter allowed to cook for a while and the turntable thoroughly run in (etc, etc), music reproduction was excellent. The record player reproduced music in a slightly soft-spoken, unobtrusive sort of way, a quality that slotted in with the much more extrovert sounding amplifier and speakers well. The Sony CD player performed competently, but never particularly engagingly. Notwithstanding a solid, neutral quality and plenty of detail, the Sony ultimately lacked credibility because it sounded weak, as though the output stage were of poor quality and unable to really cope. It's quite likely that the output stage was in fact the real problem, but either way this seems to me a primarily record based system.

The Snells, which look so mundane, were surprisingly good, and received more than their fair share of use during this project, often accompanying other hardware where a 'foreign' speaker was needed in a system. They were not wholly neutral it must be admitted. Treble is a little toppy – a quality neatly countered by the Audio Innovations amplifier, by the way – and the midband can sometimes sound recessed, one result being that the *K* doesn't always sound as explicitly detailed as I would have liked. Yet there are few loudspeakers I know at the price that get closer to the sound of a piano, capturing all the nuances from the initial transient clang to the subsequent ringing and resonant sustain. Similar observations were made with other instruments, and the Snell *Type K*



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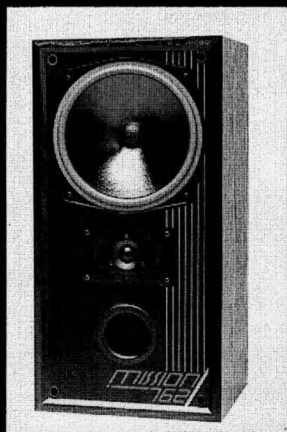
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ROKSAN TURNTABLE COMBO, SONY CD, ION AMPLIFIER, ROYD LOUDSPEAKERS.



The Roksan *Xerxes* is the first piece of truly imaginative, radical turntable technology since the standard three-point suspended subchassis scheme became accepted as the norm over a decade ago. In breaking the mould, Roksan has established a new, second polarisation in the market, and a second standard of excellence for others to aspire to. The *Xerxes* eschews a floating suspension in any conventional sense in favour of more radical decoupling methods designed to circumvent what Roksan describes as an intrinsic lack of stability in the way suspensions operate, and which results, it claims, in a lack of absolute pitch integrity under dynamic signal conditions.

As we covered Roksan's *Artemis* arm and *Shiraz* cartridge in the recent *Collection* issue, it had been our intention to use something quite different, namely a Rega arm and Audio Technica MC cartridge, which would also serve to keep costs in check. The one thing the complete Roksan front-end ain't is cheap. Unfortunately, the plans ran into problems when the makers of the amplifier chosen for the system objected on the grounds that it greatly preferred the *Artemis* and *Shiraz* with its amplifier. As the Rega *RB250* (not the *300*) and more than one AT

are used elsewhere in this month's review project, and we wanted to include the amplifier concerned, we acquiesced. But this does mean that the result is potentially weighted rather heavily in favour of the turntable. This comment is not made on spurious theoretical grounds but with that most perfect clarity of view afforded only by 20-20 hindsight.

And the amplifier in question? The Ion Systems *Obelisk 3X MkII*. Ion Systems rose phoenix-like from the ashes of Nytech, who started life with an integrated receiver (the *252* I think) packed in a box with a cheap, grotty Garrard autochanger, and which a few years down the road was being sold regularly with Linn *Sondeks*. That was then. Ion Systems now is uncompromising in the way it has been aimed at the enthusiast market.

This Roksan/Ion axis forms the hub around which this system is constructed. Royd is often associated with Ion amplifiers, and the Sony CD – well Sony is simply one of the most popular sources of CD players.

ROKSAN XERXES TURNTABLE/ ARTEMIS ARM & SHIRAZ

The *Xerxes* looks almost conventional from a distance. For example the platter looks

rather like any other two piece design with a central alloy hub (actually a more complex construction than it first appears) surmounted by an outer ring (made like the inner platter from two parts) with most of the weight concentrated at the periphery to maximise the moment of inertia. The bearing is a little odd too. The inner tool steel section is very thin and long, and it runs in a phosphor bronze housing which is made in two pieces screwed together, the design intended to provide a highly concentric assembly.

In place of a traditional suspension, the top surface of the player is stiffly decoupled from the rest of the plinth, and is cut through by a groove which helps prevent unwanted vibrational modes reaching the record or cartridge. Even the drive system shows evidence of new thinking, the whole motor being allowed to rotate against spring pressure to account for dynamic load variations – again a component in the speed accuracy equation. The player is driven by an outboard quartz referenced two phase supply with a switch selection of running speed.

As mentioned, the arm and cartridge are the ones reviewed in the *Collection* to which I refer readers who want a fuller description.

In case the two components are unamil-

iar, the brief version is that they are the logical partners for the *Xerxes* in a complete Roksan branded player. The cartridge has an EMT low output moving coil generator which provides a remarkably high output voltage by low output standards. It mates with the arm through a Roksan specified alloy block which supports the generator using an arrangement of spikes, contrasting with the more compliant fixing methods normally used.

The cartridge has an exoskeleton of trailing leadout wires, and loading capacitors. The arm has novel 'pyramid' low noise bearings and employs some novel artifices to reduce effective mass without compromising structural integrity, the most obvious of which is the free hanging unipivot counterweight. The arm tube is a one piece machined alloy tube of unusually wide diameter, and the headshell is press formed at one end from the tube itself.

All three items are exceptionally well built. The platter (and other metalwork) is now diamond turned to an extremely high standard, and the veneered plinth can be bought in various finishes, including piano lacquer. The cartridge is equally impressive. The arm is not far short, and has improved significantly in the short time it has been available.

SONY CDP-970 CD PLAYER

This year, Sony has decided that the path to fame and fortune lays in cramming in as many facilities as possible, and by playing the numbers game with its digital circuits. Ironically Sony has chosen this (in my opinion) intellectually bankrupt route just when others are beginning to show that they are willing to put the horse back in charge of the cart by showing some restraint. Well I suppose somebody, somewhere, will want not just the play and tape editing features of the *CDP-770* (reviewed separately) but can also find use for all the indexing and labelling features collected together as Custom File.

For those who haven't come across this particular piece of electronic wizardry, Custom File will store information for up to 227 discs which it recognises by the entries in its table of contents track. The information can include a name which can be programmed for display, a series of up to ten index points which can be accessed quickly during play, and a programmed sequence of up to 20 tracks. It wipes the floor with Philips' suddenly very dated looking FTS and it's all fiendishly clever. But who needs it?

Potentially more interesting, I'd venture to suggest, is the player's 45-bit, 8x oversampling *CLX1244* digital filter. This is not a 45-bit convertor which is what the unwary might take it to mean.

Like most Sony players, the *CDP-970* is well presented and slick in operation. It accepts 8cm discs and has an optical digital output. Could this be in case 45 bits aren't enough? Perish the thought...

ION OBELISK 3X MK II AMPLIFIER

The amplifier is built into two boxes, divided not into pre and power amplifiers, but full range amplifier and outboard power supply, much like the Mission Cyrus *TwoFSX* combination. There are two sets of speaker outputs; direct and switchable for headphone

use. The Ion has a limited range of inputs, numbering phono, tape and two line circuits. However the pre and power amplifiers can be used separately, and a variety of input matching boards are available for the phono input, including no less than three MC boards. It's even possible to replace the phono input with a dedicated line stage for CD in systems without record decks.

There are no other facilities, but I do have a complaint about the design of the input switching which uses mutually dependent press buttons, which will confuse granny sure as peanuts. Build quality is modestly good and styling is utilitarian enough to ensure street cred for years to come. More seriously, the Ion produced quite high levels of mechanical hum, probably from loose transformer laminations. It's only fair to note also that the controls - act smoothly and positively, and Ion makes no claims for styling.

ROYD EDEN LOUDSPEAKERS

Royd, like Ion Systems, is a small, enthusiast-led esoteric brand. The company makes three loudspeakers, all of exactly the same size, and differing only in the bits that go into them and the way they're put together. The *Eden* is the most ambitious and costly.

It inhabits a diminutive and astonishingly heavy laminated enclosure vented at the back using an unusual double vent, designed (as I understand it) to resonate in antiphase above the design cut-off point of the unaided port and hence reduce out of band emissions. The two drive units consist of a small pulp cone bass driver with a massive magnet and diecast frame, and a small plastic dome tweeter. The bass unit has no dust cap, so the decision was made to seal the front covers on permanently (I removed them only after the listening was completed). By any standards the Royd Eden is exceptionally well built. Sensitivity (if not power handling) is surprisingly high according to the manufacturer's figures, but common sense says that the real figure is nearer 85dB than 90dB/watt/mtr, and they need a decently powerful amp. The *Eden* is designed for use 1.75 inches (!) from the rear wall on tall stands.

SOUND QUALITY

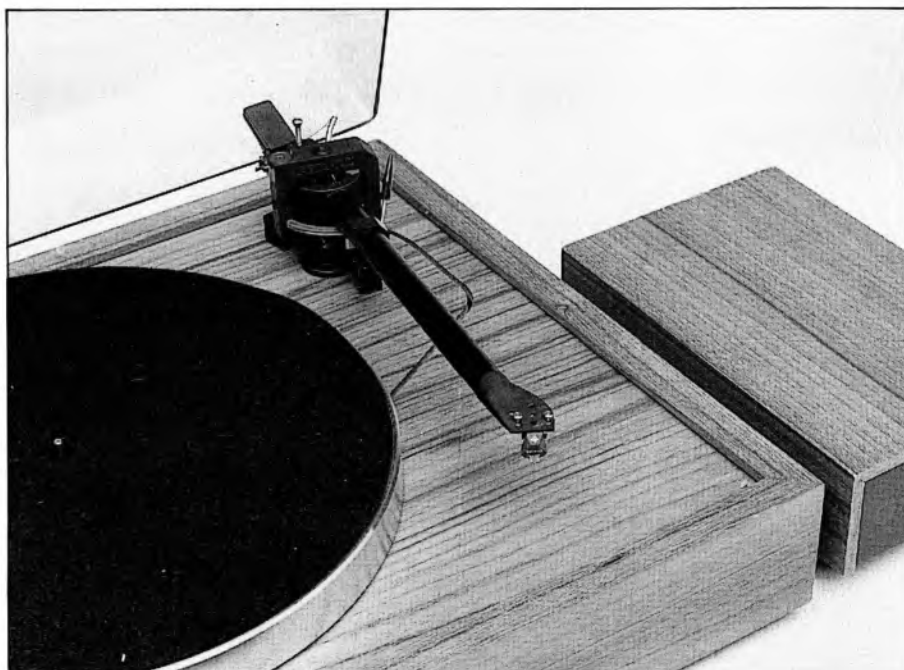
I cranked this system into life with some tre-

pidation. My past experience of Royd speakers hasn't been entirely favourable. I recall fairly awful treble quality, and I figured that whilst small speakers cannot be expected to produce deep bass, there's no excuse to get the treble wrong, and that the only reason for bad treble, when it occurs, is that the designer can't hear the problem. Given all this, there's no reason to expect him to do better with a more expensive model.

I'm pleased to say that the *Eden* was nothing like I feared. The treble isn't the smoothest on earth by any means, but it is well integrated and generally pleasant. Bass delivery depends entirely on the way it's positioned, but wall reinforcement leaves the system sounding reasonably well balanced and not excessively lacking in depth.

Beyond these relatively cosmetic points, the Royd is very much at the mercy of the amplifier it is used with. In this context the virtue of the Ion amplifier is that it has a very steady, controlled quality, and can effectively bend the *Edens* to its will. All the same the combination is a little dry and cool, lacking in expressiveness, for example with subtle yet forceful instruments like the clarinet. In two specific examples, this system made top form Gervase de Payer in the Copland Clarinet Concerto (Unicorn/HNH) sound, well, disinterested and his instrument undistinguished, and made the piano in the Gilels Beethoven *Eroica Variations* (DGG) sound mechanical and wooden. In isolation both pieces sounded fine, but changing quickly to something else showed how much music had been sapped from the sound in the name of a little extra control, pace, accurate tonal colour (a strength of the system) and other such specifically high fidelity virtues.

The Roksan arm has improved since it was originally introduced, and now lives up to the standard of the player and cartridge, the combination being all but unbeatable. In my opinion, the combination is now indisputably better than the established market reference (the Linn *Sondek*) by virtue of greater pitch accuracy through the bass, better low frequency integration and control, overall resolution and stereo soundstaging, whilst the Linn continues to offer a more authoritative and commanding style of presentation. In other respects the two level peg, or are at least interchangeable. This is a personal



reaction, and as I'm a Roksan owner I could be accused of writing with forked tongue. (I'm an ex-Linn owner too.)

But even on the worst interpretation, the Roksan is a world class combination. It suited the Ion amplifier well in all conventional senses, yet what came out of the loudspeaker sockets (driving the two Snell loudspeakers for example) was a little coarse and lacking in separation when stressed.

To complete the litany of good news, the Sony CD player sounded consistently (if only slightly) inferior to its cheaper, lower-tech stablemate, the *CDP-770*. I've reported this elsewhere; this test was my first chance to compare it to the latest cheap Philips. Its true that the Sony looks and feels very much better made than the Philips, and within the trade it's also widely said that Philips reliability is below that of companies like Sony. But if this was my money, I think I'd spend it where the rewards were greatest, even if there is a slightly increased chance that I might have to do without it at some point.

CONCLUSIONS

I found this system disarmingly unforthcom-



ing. Considering all the money that would need to be poured into it, the results seem a bit of a damp squib, or at best merely pedestrian. Certainly the system consistently failed to excite, interest or inform, and I can't see it passing my other favourite litmus test – acting as a good advocate for difficult or unfamiliar music. The same speakers with a less expensive record player to bring total system cost below, say, £1,500 would put the system into much better balance.

GENERAL DATA

TYPICAL RETAIL PRICES INC VAT

Roksan <i>Xerxes/Artemiz/Shiraz</i>	£655/£450/£489
Sony <i>CDP-970</i>	£300
Ion <i>Obelisk 3X Mk II</i>	£350
Royd <i>Eden</i>	£235
Total (ex stands, cables etc)	£2,479

TURNTABLE

Type	manual, belt drive
Speeds	33 $\frac{1}{3}$ /45
Cartridge	none as standard
Dimensions	15 x 48.5 x 38.5/7cm (h x w x d)/overhang

CD PLAYER

Digital output	optical
Headphone output	yes
Dimensions	11.5 x 43 x 33cm (h x w x d)

AMPLIFIER

Power output	40wpc
MC cartridge compatible?	yes
No. of inputs (ex tape)	3
No. of tape circuits	1
Dimensions	7.5 x 20 x 33cm each (h x w x d)

LOUDSPEAKERS

Type	2 way, reflex
Recommended placement	stands, nr wall
Impedance	8 ohms
Sensitivity	85dB/watt/mtr*
Power handling	40 watts approx
Dimensions	30.5 x 20.5 x 19cm (h x w x d)

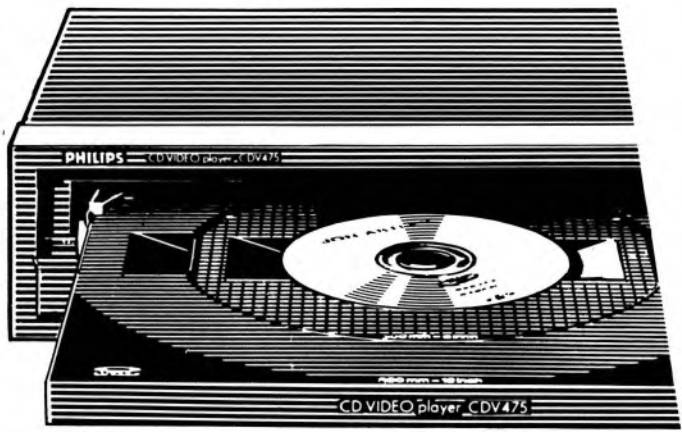
*Estimated – see text. Manufacturer's figure is 85dB/watt/mtr

Roksan Engineering Ltd, 21 Ddole Road, Llandrindod Wells, Powys LD1 6DF. Tel: (0597) 4911.
 Sony UK Ltd, Sony House, South Street, Staines, Middlesex. Tel: (0784) 467000.
 Ion Systems, Unit 28, Mochdre Ind. Est., Newton, Powys. Tel: (0686) 25266.
 Royd Loudspeaker Co. Ltd, Unit A6, Stafford Park 15, Telford, Shropshire. Tel: (0952) 290700.

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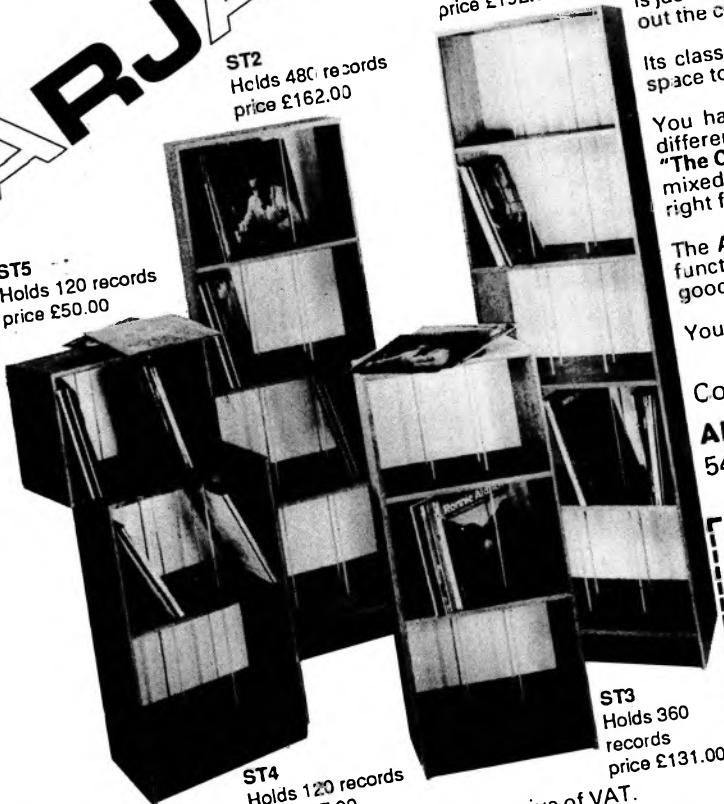
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LINN TURNTABLE COMBO, MARANTZ CD, AUDIO INNOVATIONS AMPLIFIER, SNELL LOUDSPEAKERS.



Centrepiece of this sophisticated system is the extraordinary Audio Innovations Series 500. This is an amplifier designed to be wallowed in, in more ways perhaps than the designer intended. It is certainly an extraordinary sight with the valves exposed in ranks and the Perspex half shelf in front – a startlingly original piece of visual design even if you don't like anything else about it. But I'm not sure if I'd want all that glass on show in a home with small children. It's a consenting adult's amplifier.

LINN SONDEK LP12 TURNTABLE/ ITTOK ARM & K18 CARTRIDGE

The Linn *Sondek LP12* is perhaps the only product, or one of the very few, to engender an almost religious devotion amongst certain acolytes. Yet it also courts establishment appeal, witness for example the glossy *Car*-style promotional literature packed with every turntable, and today it's perhaps the most widely respected turntable in the world. A maverick no longer, Linn has almost the cachet, and these days also some of the conservatism of Mercedes. Witness the fact that the new flagship arm (the *Ekos*) is visually

almost indistinguishable from the *Ittok*. Of course above all it is still the industry benchmark against which newcomers continue to be measured.

Given the background, putting together ten high grade systems without a Linn *Sondek* somewhere in the test is inconceivable, yet remarkably the original list had no *LP12*. There was to have been an *Axis*, but we were told that that model is being revamped and was unavailable.

Happily, Linn was able to comply with our last minute request, and the combination chosen teams the *LP12* with a current sample of the *Ittok* arm, in this case with one of its moving magnet cartridges, the *K18*, which by MM standards is expensive at £129.

Neither turntable nor arm has changed much in the last year or two, though in the case of the turntable at least, just about every single component has been upgraded at some point in its history. There are many design subtleties that can't even be hinted at here, but in essence the *LP12* represents the uncompromising application of fine materials and craftsmanship to the task of making a turntable, based on the well known theme of synchronous motor, belt drive and three

point suspended subchassis.

The chassis is made from a solid wood frame with a stainless steel top plate, intentionally unsupported along one side to provide a touch of 'give'. The three coil springs are hung from the top plate. The subchassis is a coffin-shaped, reinforced member which supports the main bearing and the laminated armboard, and indirectly the arm itself. An electronics package called *Valhalla* sits inside the unit and provides a clean quartz referenced sinewave drive for the Impex motor. However, 45rpm is not available directly. You have to buy an accessory kit which includes a sleeve that fits over the motor spindle, a clumsy and unsatisfactory bodge which the manufacturer justifies on the basis that 33 $\frac{1}{3}$ rpm performance would be compromised if the *Valhalla* board was made to provide 45rpm as standard.

Apart from an injunction against tightening the headshell screws with the arm installed on the turntable (good advice with any arm), the *Ittok* is the friendliest and most practical of esoterica. The armtube is wide, the bearings are soundly designed and everything feels as though it will last an aeon at least – and look good at the end of it. Track-

ing force as well as bias are set by spring, and both carry clear calibrations which experience suggests are quite accurate. The *K18* cartridge is based closely on the *K9*. The *K9* featured a strong body with a sound interface between stylus holder and body, and a good quality stylus. The *K18* adds an improved tapered alloy tube cantilever, and a screw (which looks very like an afterthought) that locks the stylus in place.

MARANTZ CD85 CD PLAYER

On one level the Marantz *CD85* is a sophisticated player, with excellent search facilities (intro search, directly accessible fast cueing etc), a comprehensive yet still attractive display (calendar modes etc included), a variety of repeat modes, a headphone socket with dedicated volume control and a variety of outputs, including both electrical and optical digital outputs. But this is only scratching the surface.

What the *CD85* really is about is excellence – excellence in areas like build quality, component quality and circuit attributes that might have some bearing on perceived sound quality. The more obvious manifestations include non-ferrous alloy chassis members instead of steel wherever possible, copper screening and screws, high grade PCBs, special attention to earthing demands, a switch to defeat the digital out sockets when not in use, a very elaborate, high capacity power supply and the *CDM1 MkII* mechanism with a very sweet running loading drawer. The *CD85* also includes a full set of high grade components in the audio circuits – Elna Cerafine caps, high grade *5534DD* op amps, selected *TDA1541* 16 x 4 DACs and more. The player has a strongly engineered feel, and is impressively heavy (which doesn't necessarily mean much of course). Finally, the *CD85* is fitted with deep gloss wood side cheeks.

AUDIO INNOVATIONS SERIES 500 AMPLIFIER

The Audio Innovations *Series 500* is unique in several ways, claims the manufacturer. It is, it says, the most powerful integrated valve amplifier on the market. It is also said to be the only integrated amplifier (apart from other Audio Innovations models) to run in true Class A, which is carefully specified as a circuit whose power consumption is independent of music signal level, and where the total power output prior to clipping is in Class A. The advantages claimed are that its amplifiers are more load tolerant, linear and dynamic than any other regardless of power supply reservoir capacity and output power. I can't say I agree with all that, but those are the claims.

The *500* is rated at 25 watts/channel, and has output taps for 4, 8 and 16ohm loads, with the former providing the best control at a slight cost to the amp's ability to go loud. In this system I preferred the 4ohm tap, but there was still a great deal of (graceful) power on tap before the sound started breaking up. But compression sets in relatively early. There's a sapping of energy and separation if the amplifier is driven *very* hard even before distortion became audibly apparent.

The phono input offers passive EQ, with the other inputs routed straight to the main amplifier section which drives the output in

push-pull. The amp appears well made and includes two impressive looking output transformers. The valve complement includes 3 x ECC83, 2 x PCC88 and two matched pairs of EL34 in a self-centering circuit that requires no alignment. Expected valve lifetime is said to be around 4,000 hours. The amp is equipped with a moving magnet phono input and inputs for CD, tuner, aux and tape with full tape monitoring. The company also supplied an outboard Series 800 transformer under the same brand name, the effects of which are reported.

SNELL JII LOUDSPEAKERS

The Snell *J* will set you back £699, for which you get a disappointingly ordinary looking, though quite large box fitted with an apparently conventional combination of two drive units on the front, and a port on the rear. In fact the hardware – drive units and crossover – are the same as in the *Type E*, but fitted to what Snell describes as a large bookshelf enclosure. The broad outlines of the design are almost identical to the *Type K* (discussed in a separate review in this issue) except that the 200mm bass driver has a plasticised cone and the tweeter is a 25mm soft dome unit. The system can be bi-wired, and should be for optimum results.

Attractive, white Pirate Stands (so called) were included with this system. They cost a small – start again, they cost a *large* fortune, the reasons for which soon become apparent when it comes to lifting them into position. They are astonishingly heavy, especially with the four vertical columns loaded with sand and lead, which is how they were supplied. The stands are spiked downwards, but no provision is made for upwards spiking which is a pity. I used small beads of Blu-Tack instead. Even so, these stands are dramatically better at anchoring speakers securely than the Heybrook frame stands I normally use. And whilst the Pirates don't suit everything, they do work with many medium to largish speakers, Snells included, which invariably sound convincingly more inert and dynamic as a result.

SOUND QUALITY

The Linn scarcely needs comment. It not only worked superbly, it seemed particularly well suited to the characteristics of this system, by lending more than a suggestion of

authority and drive. These things were palpably less apparent in other combinations.

Audio Innovations supplied a step-up transformer so that low output moving coils could be used, and to test this I chose to use an Oracle *Alexandria/SME IV* and Audio Technica *AT-OC9*. It didn't work. The exquisite sense of detail that this player is capable of was simply smothered at source, and the music took on an oddly listless feel. I was never able to completely eliminate hum and noise from this system either, whereas with the Linn, which didn't need an outboard transformer, hum was innocuous, though it was never completely absent. So it was back to the Linn *Sondek* with the *K18* moving magnet cartridge, which has a strong, robust kind of sound and more than adequate levels of refinement.

The Marantz *CD85* CD player was also predictably excellent in this system. Along with a number of other players, it had arrived early for the project. Having quickly established its strengths, I have been using it on a day-to-day basis for about a month before the work on this project began. The reason I chose it above the others is the same reason I commend it for use in this system. It is an excellent player. Compared to the cheaper players in this test group it sounded more solid and weighty in the bass whilst retaining an excellent sense of detail and colour. Perhaps the most persuasive difference between this player and others however, is that it sounds more obviously in command.

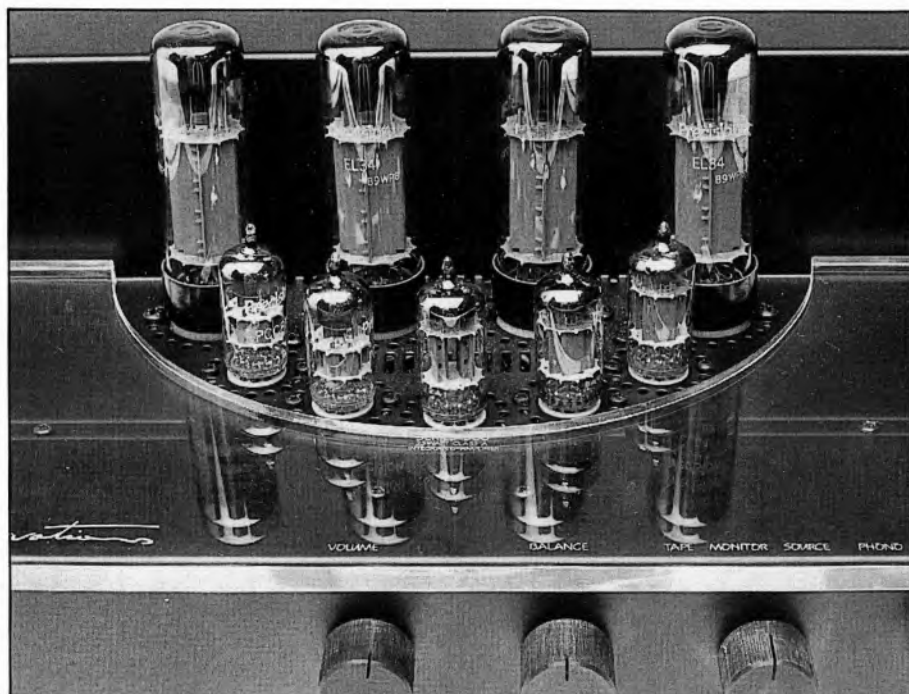
The loudspeakers and amplifier interacted to such a degree that they're best considered together in this case. One consistent finding, and perhaps the most immediately striking one, is that the whole system sounds rather distant – or, rather well distanced, which is not quite the same thing – and spacious. One reason for this is the ripe, fruity bass, which is definitely associated with the valve amplifier, not just the loudspeakers. I was able to prove this by substitution.

I was both attracted to and repelled by the standard of music this system was responsible for. It was always tantalising, providing a rare glimpse through layers of circuitry and into the heart of the music. There was never any suggestion of glare or congestion, both qualities that are in some measure associated with the large majority of hi-fi systems



built around transistors. But with the increased levels of naturalness came a clear loss of focus and dynamics. The system sounded somewhat loose and lazy, problems encapsulated on that seminal Doobie Brothers track *Livin' on the Fault Line* which had an engagingly loping gait but which gave me an almost overwhelming urge to go over to the system and squeeze something – anything – very, very hard. Even the tautness of compact disc couldn't cure the system of its fundamental sloth.

Not all the blame (or credit, depending how you look at it) lies with the amplifier. The *Type J* has some of the properties of other Snell loudspeakers, the bigger ones especially, yet it is also somewhat at odds with them. Like all Snells, the *J* is expressive and tonally colourful. I have the strong impression that Snell's designers have a special regard for the importance of the lowest octave or two, and their speakers typically have an almost architectural kind of solidity which in the UK is perhaps best associated with Linn Products' loudspeakers. The *J* certainly has this too, but it does not have quite the transient integrity, and the result is not



wholly convincing. Snell loudspeakers often seem to me to tread a thin line in the way they balance dynamics and transient ability against the gentler, more subtle virtues, and here perhaps they come closest to failing.

CONCLUSIONS

To my mind this system sounds curiously old fashioned. In my room the largish loudspeakers sounded a little under-damped, and really needed to be driven by something rock solid. The Audio Innovations amp has many fine qualities, but it simply wasn't capable of exerting the iron discipline required here. The sound the system makes is still an extremely fine one, make no mistake, but it's a highly individual one too. Try it – it may suit your tastes/prejudices/preconceptions.

GENERAL DATA

TYPICAL RETAIL PRICES (INC. VAT)	
Linn Sodek/Ittok/K18 cartridge	£509/£429/£129
Marantz CD85	£500
Audio Innovations Series 500	£799
Snell JII	£699
Total (ex stands, cables etc)	£3,065
TURNTABLE	
Type	manual, belt driven
Speeds	33 $\frac{1}{3}$
Cartridge	none as standard
Dimensions	15 x 45 x 36/6cm (h x w x d)/overhang
CD PLAYER	
Digital output	optical/electrical
Headphone output	yes
Dimensions	10.5 x 46 x 35cm (h x w x d)
AMPLIFIER	
Power output	25wpc
MC cartridge compatible?	no
No. of inputs (ex tape)	4
No. of tape circuits	1
Dimensions	10 x 47 x 25cm (h x w x d)
LOUDSPEAKERS	
Type	2 way, reflex
Recommended placement	open, stands
Impedance	8 ohms
Sensitivity	92dB/watt/mtr
Power handling	150 watts
Dimensions	58.5 x 33 x 25cm (h x w x d)

Linn Products Ltd, Floors Road, Waterfoot, Eaglesham, Glasgow G76 0EP. Tel: 041 644 5111.
 Marantz Audio (UK) Ltd, 15-16 Saxon Way Ind. Est., Moor Lane, Harmondsworth, Middx UB7 0LW. Tel: (01) 897 6633.
 Audio Components Ltd., Unit 8, Dyke Road Mews, 74-76 Dyke Road, Brighton BN1 3JD. Tel: (0273) 203277.

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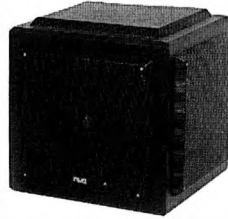
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ALPHASON/AUDIO TECHNICA TURNTABLE COMBO, ARCAM CD COMBO, NVA AMPLIFIER, SD LOUSPEAKERS.



If I've done my arithmetic right, this is the second most expensive system in the project, and as you will see I've used this as an excuse to judge it by suitably harsher standards. We're firmly into enthusiast territory here of course, with each of the system components being supplied by small, specialist producers. A&R is the only supplier of the four with something approaching a national 'name', but the others are all highly respected in their fields, and are sold through (supposedly) ethically approved, user friendly specialist dealers.

ALPHASON SONATA TURNTABLE, HR-100S-MCS ARM & AT-OC7 CARTRIDGE

The Alphason *Sonata* turntable is one of the very few British designs which use high levels of mass to damp down resonances and ensure stability. Mass alone doesn't cure anything, but when used intelligently in a well engineered deck like this one, the results can be very persuasive.

The *Sonata* is deceptively shallow and sleek in appearance; attempt to lift it up and you'll see what I mean. The physical design of the deck is not unrelated to other suspended

subchassis designs except that the subchassis is a massive block of cast iron. The springs are very long (note the three very tall suspension towers) and the platter is an inert one piece composite. The record is held in a clinch by a heavy centre weight.

The drive system employs two synchronous motors, spaced 180 degrees apart. The arrangement increases torque too, and also alters suspension dynamics by eliminating the asymmetric pull of a belt in a single motor player. Speed change is by switch, and the unit is driven by an outboard power supply. Suspension levelling is from above, but the feet are adjustable from below.

The arm is Alphason's top model, and one of the few S-shaped arms still available. Its key features are the one piece titanium headshell/armtube, the headshell being stamped from a single thickness of metal at the end of the tube. At the back, the arm tube terminates in a join just in front of the ceramic bearings. The arm base is Linn compatible, and the detachable arm cable is from van den Hul. Surprisingly, the vertical arm bearings are set so that cartridge alignment, as viewed from the front, varies as the cartridge rides warps.

For this test we chose to use an Audio

Technica *AT-OC7* low output MC cartridge, a design with a reputation for clean, detailed sound quality and consistency.

ARCAM DELTA 170/BLACK BOX 2 CD PLAYER

Arcam's CD player has been available for a couple of years, and the *Black Box* outboard digital convertor for at least half that time. Finally, Arcam has done the obvious thing and introduced a version of the *Delta* CD player without the on-board DACs and analogue circuits, but with electrical and optical digital outputs. In this player the transport mechanism is the diecast *CDM1 Mk II*, and the power supplies have been upgraded, with a dedicated transformer for the output board to reduce undesirable interactions. There's also a three position switch for the display (high/low/off, the latter sounding clearly best on audition) otherwise it's the same basic Philips type facilities and display and remote control.

The *Black Box 2* is a £50 extra cost version of the standard *Black Box* with an optical input. In other respects it too has changed little. Facilities include high and low output voltage sockets (use high if possible) and an

absolute phase switch on the front. The circuitry is basically Philips via Arcam, but includes a custom 'Black Box' IC which performs much of the digital housekeeping, leading to a simpler, more elegant circuit.

NVA P60/A40/PSU AMPLIFIER

I can sum up this amplifier in one phrase: minimalism minimised. It possesses all the accepted attributes of an audiophile amplifier: plain aesthetics, rude (though adequate) construction, plus some old fashioned virtues that seem to be going out of fashion elsewhere such as phono sockets that don't fit phono plugs very well. Operating features consist of on/off, volume and source switching, and there aren't too many sources to switch. Just tape, two line inputs and a phono input configured for moving coil cartridges.

Despite all this relentless simplicity, the amp comes in no less than three boxes: a preamp, a power supply for the preamp, and a power amp, all bar the preamp being featureless black boxes of the 'plug in and enjoy' type. Lovely . . .

The circuit topology NVA has chosen gives the power amp a high input sensitivity and low capacitance; preamplifier gain in the line stages is therefore deemed unnecessary and the preamp is passive except for the phono input. In the case of the phono input, each active stage has its own discrete, regulated split rail supply derived from one, two or four PSUs. One was used for this test.

The A40, described by NVA as a stereo, single power supply power amplifier with a 300VA power supply, comes from the bottom of the NVA hierarchy. The power amps contain no protection circuitry. As the manufacturer rather archly announces, 'they are not idiot proof'. The type of speaker cables to be used is tightly specified for stability reasons, and NVA supplied lengths of suitable thin 7-core silver alloy cable.

The NVA amplifier range is designed to be easily upgradeable in such a manner that none of the investment made at any point is lost, with allowances always being available at the *current* selling prices. The upgrade prices are identical to the difference in retail cost of the amplifier with its respective starting and finishing specifications.

SD OBS LOUSPEAKERS

At the top of this very handsome design is a plain wooden baffle, angled slightly back at each side and completely open at the rear. To this baffle are attached a 25mm metal dome tweeter and a 135mm paper cone unit. In a smaller two-way speaker, the larger unit would act as the bass driver, but because it's mounted on an open baffle, the deep bass is missing due to cancellation effects between the front and rear of the cone. Consequently, the base of the speaker contains a second, slightly larger driver mounted in a ported enclosure with the port facing backwards. The drivers and the rear cavity are covered by removable frames, and from the front all other visible parts are wood veneered to a high standard.

The OBS is designed for free standing use well away from walls and other obstructions. The system contains a well specified crossover, which can be wired using one, two or three sets of cables from the accompanying amplifier. The base of the enclosures are tap-

ped and bushed for carpet piercing spikes, but there is a problem here in that the enclosures are shallow and most of the weight is near the front baffle, whilst the front spikes are quite a long way behind the baffle. As a result, the enclosure is unstable, and will fall forward at the slightest provocation. I believe that feet of the type supplied with the Magnepanar speakers (see review) should be used.

SOUND QUALITY

The first time I heard the SD OBS, they sounded nice (a cardinal sin?) but woolly and a little dull – both tonally and also musically. The bass tended to boom slightly. Some time later however, I started to hear good things of the OBS, the word being that they had settled down in production and had lost their terminal softness.

The new whiter washing SD OBS is unmistakably brighter and sharper, and as a result the speaker shows the old one a clean set of heels in such areas as speed and resolution. But it also has a streak of hardness. There's something in the midband that isn't too pleasant, and it isn't well integrated either; the system sounds phasey with some material, and stereo images shift wildly in position and perspective with quite small changes in listening position. This as they say in the trade is a dead giveaway. Finally, the bass *still* sounds boomy, despite being disguised somewhat behind a new found brighter, sharper balance.

Reading over what I've written makes the SD speaker sound like something of a pup. It isn't, but I admit that there was a point when I was beginning to conclude that it was. By now the time had come to try them within the test system, where I was able to swap one rather cluttered working room for a proper single speaker listening environment, and an ill-sorted and, er, modest pile of hi-fi equipment for the Alphason, NVA and other components used in this system.

And now there was a change. Quite suddenly the OBS began to show that it was, after all, a loudspeaker with real breeding, a design that was capable of cutting the mustard. Immediately it appeared to have a coherent sense of direction and focus. The sound opened out and seemed more transparent, with greater 'snap' and image focus. Dynamics were stronger, the bass better controlled.

Not that the bad bits disappeared. The OBS is boomy in the bass, and the hardness and the phasiness remain scarcely diminished in extent. But these symptoms, which I had taken to be indicative of a more general malaise, suddenly began to recede in importance in the face of some real music making ability.

Was the improvement enough to warrant a complete change of mind? Perhaps, and then again perhaps not. I lean towards the latter view. This is a relatively expensive system and I don't see why such shortcomings should be tolerated. But the real point here is that such a change occurred, which is a sure sign that the rest of the system was doing its thing. And that, surely, is the message. The system sounded excellent, by which I mean primarily that the record player, CD player and amplifier were doing an excellent job.

The amplifier completely belied its home brewed appearance by sounding like a true thoroughbred. The special quality it brings to the system is simplicity. It sounds as though it's based on a simple, short circuit, and therefore it manipulates the music less than most. I felt that the musical qualities it was expressing were often purer and closer to the real thing than with many others, though the NVA is certainly no smoother or deeper or sweeter than most. In fact the bass end is if anything slightly curtailed, not in depth – it just sounds a little lean and dry.

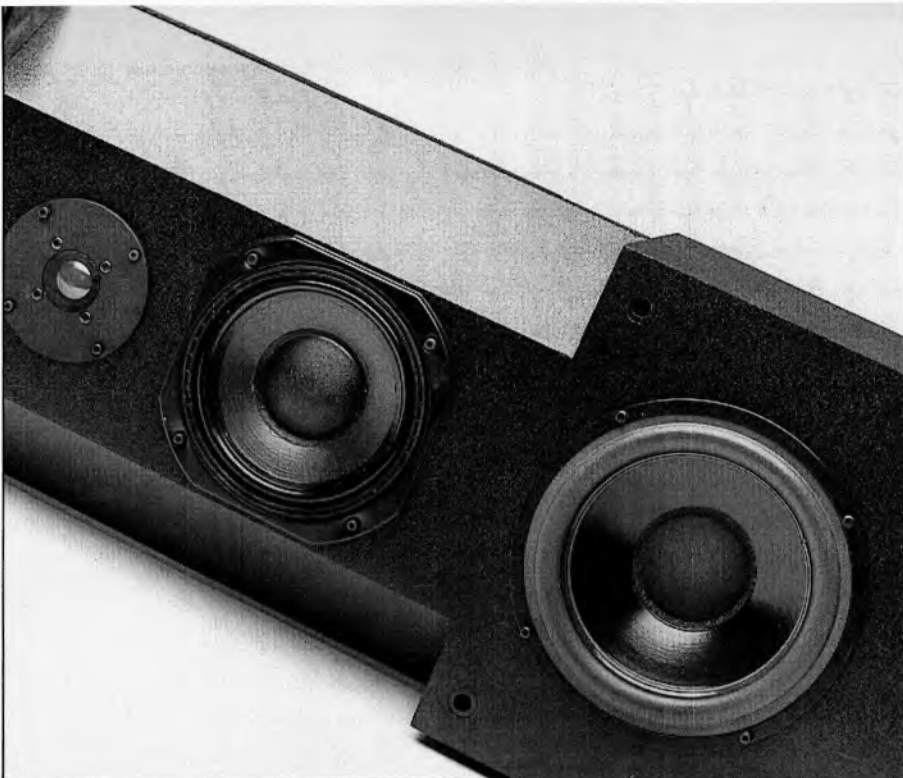
The two source components are more similar than you might think given that in their other lines, one is a piece of chalk and the other is cheese. Assessed in each case partly by substituting other comparable components (in the case of the CD player for example, I used the Denon DCD-1520 and Marantz CD85), I discovered that each is characteristically powerful and authoritative in presentation, and that they are both otherwise quite difficult to pin down. This is a good sign because it means they are not imposing too much of their own character on the music. Nevertheless there were signs that the turntable could sound a touch ploddy and lacking in air (the Roksan player for example is significantly better here) and I even thought I could detect some low rate speed variations – wow – for example through the occasional dying piano phrase. But the problems were mild ones, and on the whole the system gave of its best with black vinyl.



But CD ran records close. The A&R is a first class player, though again it sounds very slightly lacking in low level resolution, and its rate of change to small scale stimulus can seem a little tardy, giving rise again to a sometimes rather pedestrian quality. A year ago I would have considered the A&R a top ranking product at the price, but already it's beginning to succumb to the competition. You'd have been shocked (as I was) to discover how at home a sample of Marantz's £150 CD583 sounded in this system.

CONCLUSIONS

I was particularly struck with the amplifier, which is a first class design and streets ahead of most amplifiers in its area of the market. But I do not absolve it from censure on other grounds, notably the tacky finish, the iffy build quality, ill fitting phono socketry and perhaps most worrying, a degree of susceptibility to mains borne interference. The Alphason is a world class product in every respect, and I'm rather inclined to blame the very slight wow problem on a sample problem or even my setting up, since I've heard this deck sound absolutely stable elsewhere.



I'm still not saying it would be my first choice of turntable, a comment that applies to the A&R two box CD player which certainly brings an Alphason-like repertoire of skills to the CD player market. Finally, I remain a little disappointed by the speakers. It's true that they delivered in the end, but they did so almost despite rather than because of themselves. They must be tightened up in the bass and refined higher up the frequency band – and they must be made physically stable.

None of the components escapes some censure then, but as a system they perform more convincingly than you might expect. System synergy rules, OK?

GENERAL DATA

TYPICAL RETAIL PRICES INC VAT	
Alphason Sonata/HR-100S/MCS/AT-0C7	£1,200/£250
Arcam Delta 170/Black Box 2	£599/£300
NVA P60/A40/PSU	£250/£280/£160
SD OBS	£695
Total (ex stands, cables etc)	£3,734

TURNTABLE	
Type	belt drive, manual
Speeds	33 $\frac{1}{3}$ /45
Cartridge	none as standard
Dimensions	16 x 46 x 26/7cm (h x w x d)/overhang

CD PLAYER	
Digital output	optical/electrical
Headphone output	no
Dimensions: 170	9 x 43 x 26cm (h x w x d)
Black Box	6.4 x 43 x 26cm (h x w x d)

AMPLIFIER	
Power output	40wpc
MC cartridge compatible?	yes
No. of inputs (ex tape)	3
No. of tape circuits	1
Dimensions A40/P60 & PSU	40/60 x 21 x 9cm (h x w x d)

LOUDSPEAKERS	
Type	3 way dipole/reflex bass
Recommended placement	open, free standing
Impedance	8 ohms
Sensitivity	86dB/watt/mtr
Power handling	100 watts approx
Dimensions	102 x 35 x 25cm (h x w x d)

Alphason Designs Ltd., Unit 2, Linstock Way, Wigan Rd., Atherton, Lancs M29 0RL. Tel: (0942) 897308.

Audio Technica Ltd., Technica House, Lockwood Close, Leeds LS11 5UU. Tel: (0532) 771441.

A&R Cambridge Ltd., Denny End Ind. Centre, Waterbeach, Cambridge CB5 9PB. Tel: (0223) 861550.

Nene Valley Audio, 1 Church Farm, Hatley St. George, Nr. Sandy, Beds. Tel: (0767) 50532.

SD Acoustics, Unit 1, Rear of 39-43 High St., New Malden, Surrey KT3 4BY. Tel: (01) 949 1623.

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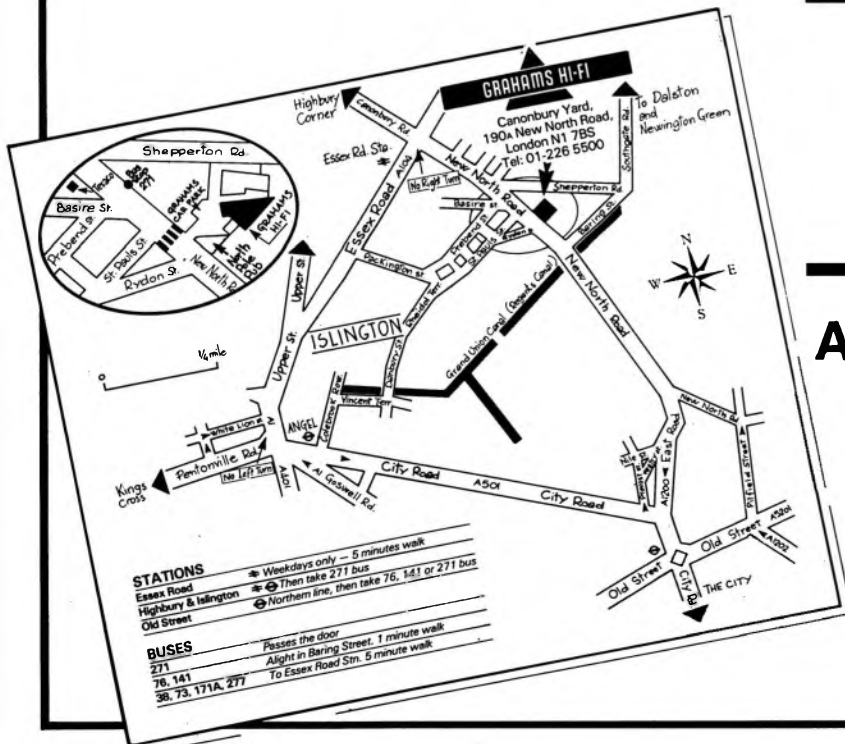
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PT TOO TURNTABLE, SME IV ARM & VAN DEN HUL MC2 CARTRIDGE

The Pink Triangle *PT TOO* is one of the three or four leading UK turntables that together help define the present state of this art. It has been the subject of slow, steady development, and continues to improve in performance standards. Within a neatly designed wood plinth, it contains a suspended sub-chassis made from light, stiff Aerolam aluminium honeycomb material, and it employs a one piece synthetic platter (belt driven by inner mounded hub) and a massive inverted bearing. The unit can be driven by an AC supply (as for this test), or a cleaner, rechargeable battery supply.

The 'budget' SME *IV* along with the closely related *V* marks a return by SME to the audiophile market for rigid arms, and fulfils its brief with some of the finest (and most complex!) engineering ever to be seen on a pick-up arm. The most striking feature is the

one piece magnesium cast arm tube, head-shell and bearing yoke, a technological tour de force by any standards. Finish and presentation are simply in a class of their own.

The van den Hul cartridge range is a kind of showcase for the well known van den Hul stylus profile. This is an expensive fabricated metal bodied low output MC cartridge, engineered to a high standard.

DENON DCD-1520 CD PLAYER

The *DCD-1520*, which replaces the well liked *DCD-1500*, ushers in Denon's new digital converter technology, which is one of a range of options being explored by different manufacturers centred on variations on the larger number of bits/higher oversampling rate theme. Denon's idea is a hybrid (which alone almost guarantees it won't find its way into the next generation of players in its present form) designed to achieve 20-bit conversion using 18-bit DACs and discrete circuitry for the last 2 bits. It uses 8x oversampling along with digital filtering and parallel processing of the two channels.

The Denon is extensively endowed with just about every search, repeat, memory and tape editing feature you can name, and perhaps the odd one you haven't thought of, like a facility whereby a point specified by

time (minutes/seconds) can be addressed directly. The player has both fixed and variable outputs which can be controlled from the remote handset, and two digital outputs, electrical and optical. Best of all, for both visual and musical reasons, the complex display matrix can be switched off in its entirety. In this mode, some information is still given when the music isn't playing, but it's kept discreet.

BRYSTON 12B PREAMPLIFIER & 3B POWER AMPLIFIER

Bryston is a Canadian import of very exactly specified amplifiers, distributed in this country by Roksan.

The preamplifier, called the *12B*, is a little more fully equipped than you might expect. It has separate 'tape' and 'listen' selectors, and includes two tape circuits allowing cross dubbing in either direction if the fancy takes you. There are two phono inputs too, one each for moving magnet and moving coil cartridges. A switchable filter (6dB/octave below about 30Hz) is fitted to the phono inputs, and other facilities include a -20dB muting switch and a headphone socket. There are also two sets of outputs, one of which, described as a 'remote' output to drive

distant power amps for example, is taken from before (and is therefore unaffected by) the volume control.

The power amplifier has LED overload monitoring, and can be bridged for high power mono use. It is rated at 100 watts/channel, and double that into 4ohms. Both items are beautifully made and presented, and surprisingly compact. The preamp is especially sleek, whilst the power amplifier feels as though it was cast from a single lump of iron.

MAGNEPLANAR MGIIIa LOUSPEAKERS

Magneplanar Inc, manufacturers of Magneplanar loudspeakers (that always causes a bit of confusion) is in the business of making planar dynamic – not electrostatics – flat film diaphragms, which they permutate in different ways in the various models.

The *MGIIIa* takes the form of a large area flat baffle, the centre part of which is cut out and replaced by the drive units, of which there are three. The bass section consists of well over four square feet of radiating area, and the midrange a little over one square foot. The tweeter is a vertically oriented ribbon over four feet in length. The crossover points are at 300Hz and 3kHz, and the section that controls the bass and midrange unit is housed in a separate box.

The system can be bi-wired using optional extra crossover components or electronic crossover (neither option was tried), the crossover section between the mid and treble being non-getatable. The system stands on square section metal feet which project well forward and behind the panel, but a considerable degree of flexure remains in the system, and no provision is made for spiking.

On the whole the system is beautifully made, with a tremendous amount of attention to detail. However, someone slipped up with the outboard crossover which has large inductors and capacitors floating around supported only by the soldered wiring. Inevitably one of the joins had given way on one crossover when it reached me (I resoldered it), and in both cases there were loose bits of chipped plastic from the outside of some component, though I couldn't identify which one.

SOUND QUALITY

It would be putting it too mildly to say I was disappointed in the sound of this system. Not to put too fine a point on it, it was a shambles.

A smaller Magneplanar, the *MGI*, has provided some seminal moments for me. It was the first panel loudspeaker I used in depth, and I found it entrancing, partly for its openness, and also for the big, positive way it presented music. These are qualities that lay outside the compass of most loudspeakers, or at least loudspeakers of the time. But I had a lot of trouble getting them to work. After several months' trial and error, I identified three points that seemed to spell the difference between success and failure.

One, the speakers needed very firm control from the amplifier. This is one of those speakers that really demands high damping factors, abundant low impedance current drive – in other words a Krell, and not just a small one. Next, there was the question of positioning, the secret being to 'focus' the

sound being reflected from rear walls, a task that had to be accomplished an inch at a time. Finally, I found it necessary to have the *MGI*s lifted a few inches from the floor (it would be centimetres now, of course) and supported on solid, spiked feet.

The considerations that affected *MGI* performance are exactly the same as those that influence *MGIIIa* performance except that being considerably taller (this is the principal physical difference), the mechanical support problems are magnified in the *MGIII*. The penalty for getting it wrong with a pair of *Maggies* is that the upper bass becomes blurred and congested, the speakers sound slow and the sense of presence that is the mark of good imagery is replaced by amorphousness.

And that is precisely how they sounded, even after running them in (with Mahler's *9th* – no rubbish!) for 72 hours continuously behind closed doors. But with the *MGIIIa* I felt that the familiar *MGI* problems were increased substantially, and I could not get them to respond to any of the corrective measures I had to hand. Repositioning didn't help a great deal, and the design of the stands, whilst better than the original pattern, remain inadequate. Unfortunately I no longer have the heavy, spiked stands Cliff Stone made for the *MGI*s, so I could neither lift the speakers nor support them properly.

It was clearly impossible to make sense of the rest of the system without drastic surgery, so it was out with the *Maggies* and in with a pair of the latest version of the Martin Logan *CLS*, another US panel design but this time an electrostatic with a clearer, more concise style of music making. That is exactly what the system delivered. But I had to make another change too. The power amp had to go in favour of a Krell *KSA-200* because the poor Briston power amp flashed its red overload LEDs in distress the moment listening levels approached what might be described as realistic with many species of (predominantly classical) music.

The Briston pre and power amps are good by any standards, but I may have been spoiled by some of the designs (including much cheaper ones) I've heard recently because I wasn't as completely bowled over by them as I expected to be. Separately or together, they are both extremely clean and dynamic. They offer a variety of firmness and precision at low frequencies that is highly

unusual (there's a caveat here which I'll return to shortly), and they are also extremely consistent with level and at different frequencies. Despite the apparently all too finite power yield of the 100-plus watt amplifier into the difficult Martin Logan loudspeakers, the power amp can't be readily driven into inconsistent sounding areas of operation. Even if it isn't the case, the amp *sounds* unbustable. But there is a coldness amounting almost to glare in this amplifier too, even after a long warming up period. I should add that Roksan told me not to use the amp until it had been on for four hours, but I gave it much longer than that.

The caveat noted above is the moving coil input, which falls into a trap I have noticed with nearly all other amplifiers that use a transformer based MC stage. MC transformer design is a highly specialised skill not always found amongst solid state amplifier designers, and this one demonstrates the veracity of that statement by sounding dull, distant and muddled.

The improvement when I switched from the van den Hul MC cartridge (itself a fine, lively sounding device) to a moving magnet (a Linn *K18*, fitted to another turntable for convenience) was almost palpable. It has to be said that this was some loss, not just for the obvious reasons, but because it helped conceal the strengths of what turned out to be a very fine sounding player and cartridge. The Pink Triangle sounds on better form (and incidentally more pitch stable) than previous samples I've heard. It obviously works well with the SME too, the combination having something of that clipped incisiveness, presence and detail that characterises the amplifier.

Last but not least (as the saying goes) we come to the Denon *DCD-1520*. Perhaps because the preamplifier sounded happier with line sources than with moving coil cartridges, the Denon gave a very good account of itself. It is a fine player, but I stress that when the MC cartridge was put to one side, either by using another preamplifier (a DNM) or a record player with a moving magnet cartridge (the aforementioned Linn), the decision went firmly the way of analogue. As the saying goes, it was simply better.

The Denon shows a considerable advance on what came before, but it didn't have the perceived dynamic range or transparency.



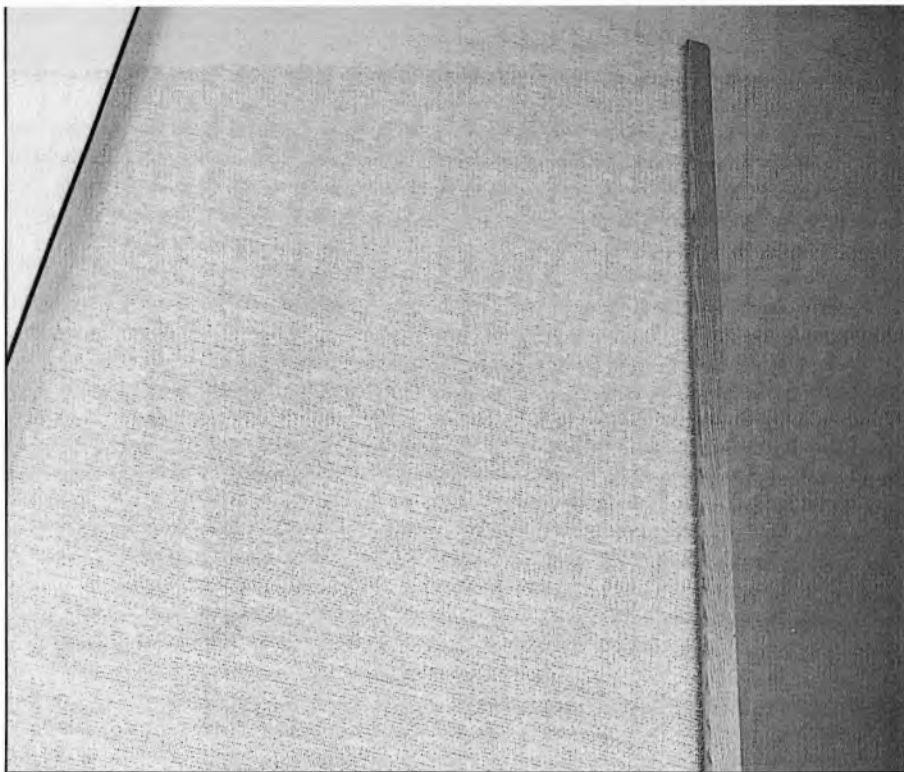
CONCLUSIONS

I concede that I may not have given the Maggies enough room to 'breathe' and that a larger room would have been desirable. On the other hand the Apogeos I normally use and the Martin Logans I did use are smaller. They're not *that* much smaller, and they don't suffer from the congestion, slowness and other ills outlined at all, or at least not to a significant extent.

One thing I was unable to do however, was to run the Maggies for the one month plus that the design is said to need to open up fully in the bass, which is where I experienced the main problems. I wasn't able to try a better means of support either. Ideally they need rigid spiked stands which raise the speakers a few inches clear of the floor. Of course, I cannot say how the Maggies would have sounded had all these points been attended to.

The changes I made to this system to make it work did the trick but at enormous additional cost, and the reality is that the system really needs rethinking from the ground up.

At the end of this test I can only talk confi-



dently about individual components. The turntable and arm for example I have nothing but praise for. The SME seems a particularly propitious match for the *PT TOO*, as it is with the Oracle range. The *PT* itself simply sounds better every time I hear it. The Denon is good too, though whether it is quite good enough for a system of this one's pretensions (note wording) I don't know. The amplifier I can admire for many reasons but I'm not convinced by either pre or power amp, and the loudspeakers – well you know about the loudspeakers. And the system as a whole? There's only one answer to that. What system?

GENERAL DATA

TYPICAL RETAIL PRICES INC VAT	
<i>PT100/SME/kan den Hul MC2</i>	£650/£810/£899
Denon <i>DCD-1520</i>	£500
Bryston <i>12B Preamp/3B Power Amp</i>	£995/£995
Magneplanar <i>MG11a</i>	£2650
Total (ex stands, cables etc)	£7,499

TURNTABLE	
Type	manual, belt drive
Speeds	33 $\frac{1}{3}$ /45
Cartridge	not as standard
Dimensions	15.5 x 45 x 39.7cm (h x w x d)/overhang

CD PLAYER	
Digital output	optical/electrical
Headphone output	yes
Dimensions	13.5 x 43.5 x 36cm (h x w x d)

AMPLIFIER	
Power output	100wpc
MC cartridge compatible?	yes
No. of inputs (ex tape)	5
No. of tape circuits	2
Dimensions: pre	5 x 48 x 27cm (h x w x d)
power	13.5 x 48 x 23cm (h x w x d)

LOUDSPEAKERS	
Type	panel, 3-way
Recommended placement	pen, free standing
Impedance	3 ohms
Sensitivity	83dB/watt/mtr
Power handling	200 watts approx
Dimensions	182 x 61.5 x 4.5cm (h x w x d)

Pink Triangle Projects Ltd., 4 Brunswick Villas, Camberwell, London SE5 7RR. Tel: (01) 703 5498.
 SME Ltd., Steyning, Sussex BN4 3GY. Tel: (0903) 814321.
 Viper, P.O. Box 13, London E18 1EG. Tel: (0268) 590789.
 Hayden Labs Ltd., Hayden House, Chiltern Hill, Chalfont St. Peter, Bucks SL9 9EW. Tel: (0753) 888447.
 Roksan Engineering Ltd., 21 Odole Road, Llandrindod Wells, Powys LD1 6DF. Tel: (0597) 4911.
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Sevenoaks Hi Fi 01-658 3450
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CHOOSING AND USING . . . YUPPIE BLASTERS

*An introduction to the species by
resident non-yuppie JK.*

The term 'yuppie blaster' (possibly coined by Bob Crabtree of ERT) seems curiously apt in describing upmarket CD-equipped portables that are on the market at £150+, double the price of the most pretentious stereo-cassette-radio 'ghetto blaster'.

The latter have been one of audio's success stories in the '80s, opening up new markets for second/third systems with holiday/weekend away capabilities, and appealing strongly to young people – as much because of their compactness and transportability as the capacity to run off expensive batteries while annoying the neighbours.

Increasing affluence (amongst the affluent) suggests that the addition of CD playback should expand the portable market still further, particularly in value terms. However, prices are not that much higher than for a CD-only standalone mains player, so the flexibility of a portable package may present a tempting alternative to customers planning their first CD player.

This assessment of a batch of ten yuppie blasters has been carried out entirely subjectively – more rigorous lab testing is largely unnecessary, as the engineering constraints in terms of weight and power consumption mean that these portables are comparatively crude compared with mains/domestic hi-fi.

The listening was initially carried out with the units below ear level and facing the listener. But experimenting with siting revealed that the smaller players provided a better tonal balance off-axis (ie with less direct treble output) and even at floor level (hence boosting the bass).

Record/replay cassette quality was tried using Maxell *ULS* tapes.

The recording standard on all models is limited to some degree by automatic level control. *In extremis* this could adjust the record level to make everything the same volume, though in practice the systems used are

more 'intelligent' than that, though inevitably some gain-riding and compression effects will mar recordings.

Program material included rock, classical and pop on both formats.

CONCLUSIONS

Given the limitations imposed on portable stereo systems, most of the blasters tested managed to come up with fairly reasonable sound quality. The CD medium gives them a substantial sonic advantage over the standard cassette-based machines that have become so prolific, albeit at a significant price increase. However, if used on battery power, the combination of disc drive and laser transport will prove fairly expensive, using even more power than a cassette deck.

However, the players are hardly in the forefront of digital audio technology, and most sound as if they use first generation bit and oversampling rates. None of the manufacturers' specifications volunteered the aforementioned information, which would suggest that it may not be all that impressive.

The practicality of making this medium portable is somewhat debatable to say the least. Being made of soft plastic, compact discs mark quite easily, and contrary to public perception, CD players can get stuck on the grooves in much the same way as record players. The units were tested for their ability to operate whilst in motion, and most could withstand light swinging but gave up if jarred, in some cases to the point of taking some time to recover their bearings and recommence play. They would be more comfortable in a domestic situation where space is short, or as a somewhat inadequate substitute for a full blown hi-fi.

Comparing these outfits on sonic grounds, with alternative CD-based systems tends to show them in a poor light, as the standards of conventional loudspeakers and amplifiers can hardly fail to be significantly

better. Small built-in speakers have several flaws, not the least of which is their fundamental inability to reproduce the lower registers, resulting in a severely constrained frequency response. The players that featured some sort of extra bass were notably more palatable in this respect, but tended to be a bit upper bass heavy when poorly sited, such as on the floor by a wall.

Transmission of vibration from inbuilt loudspeakers to the CD player in particular is not likely to help things either as this medium will have to work considerably harder than if it was isolated. On most of the players tested the sound quality available from pre-recorded cassettes is handicapped by the absence of Dolby noise reduction de-processing, as the encoding is already incorporated during the recording of most commercial tapes. Given the restricted high frequency output of most of the blasters' loudspeakers, this may not be an impossible situation, but it is a pity nonetheless.

Few of the players had the good sense to provide an external aerial socket which could have pulled up the standard of radio reception considerably at little extra cost. Another more serious omission is of a vinyl disc input for connecting an external record player. Despite the dreams of marketing men, the vinyl format is still very much alive, and in a domestic set-up such an option could undoubtedly be useful.

However, the situation is not

all *that* grim, and there are a variety of advantages to what are after all fairly compact multi-source stereo systems, which can be used off the mains, in the car and even on the beach (assuming it's not a sandy one). They are a lot more robust than most other music sources except perhaps Walkmans – and how else are you going to achieve street cred?

The overall quality encountered in this group was not that impressive and definitely lower than that heard on our last test in December '87. However, it must be remembered that the true yuppie blasters in this test are a lot cheaper than those in our first group.

The ones that stood out on sonic grounds include the odd man out in the group, Bose's *Acoustic Wave*, which is admittedly only just a portable music source and doesn't play discs. But it does create something akin to bass, which is more than can be said for the rest. JVC's *PCX-510* and Sony's *CFD-D73* also acquitted themselves somewhat better than the competition, managing to create lively and, dare I say, *musical* renditions of the material they were given. As for the rest, well, each had something novel to offer but few managed to make the grade when it came to fidelity or even enjoyability, but perhaps we are being too hard on them. After all, even the most abysmal tranny can be a source of entertainment!



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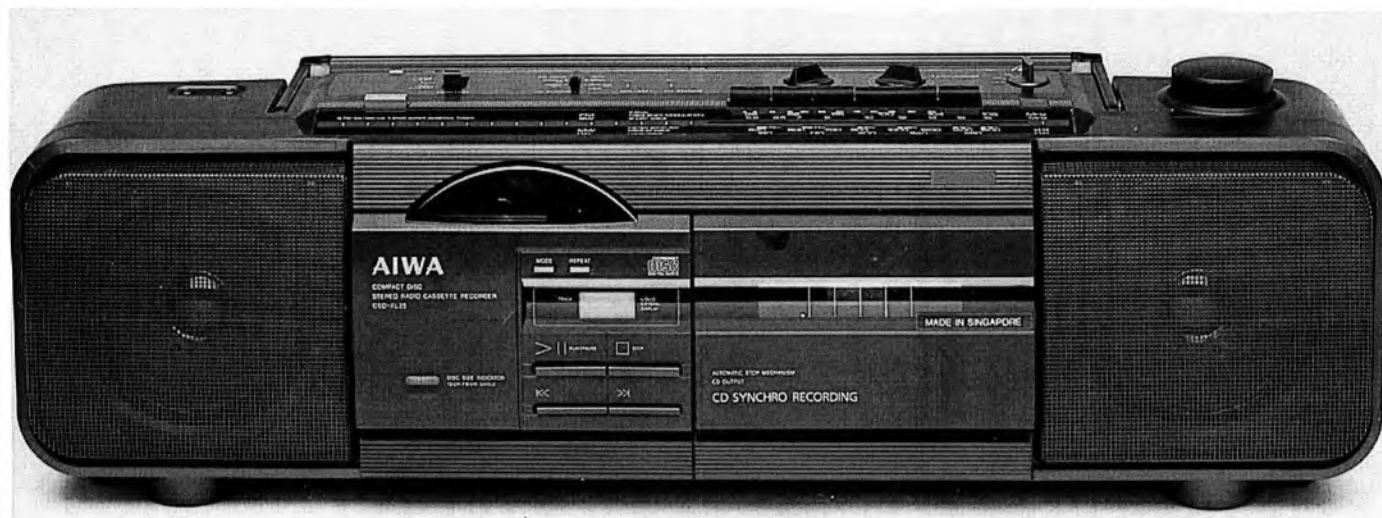
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At a mere £150 the *CSD-XL25* is a remarkably cheap yuppie blaster and at literally half the price of those we looked at in December '87 it offers the same sort of feature count. Admittedly it weighs less and doesn't have the relatively high quality finish that those first generation machines had and whether it will last as long is also debatable.

On the first sample of the *XL25* that we received the cassette deck worked on one channel only, which is obviously a sample fault but also a warning to anyone purchasing any blaster to check it out before you leave the store.

Its relatively low cost is inevitably reflected in the features department; for instance there ain't no graphic equaliser, just a tone knob, and there's only one tape deck, but then almost the same could be said of the Grundig at twice the price. And remarkably it has something that none of the others does; twin headphone sockets! Well I expect someone will find a use for them.

On the styling and finish front it concedes very little to dearer models; okay so it's pretty plasticky, but then so are the others. One benefit of cost constraint is its relatively small size – after all, who wants a hulking great black plastic box in their room? I know I wouldn't – unless it was particularly stylish, of course.

COMPACT DISC

This is the only player in the bunch which has its disc compartment vertically on the front face and consequently the centre spindle can't be used for locating the disc – a special tray does this job. For 3-inch discs a second tray can be levered out from the door by moving a red plastic switch – all a bit tacky but apparently effective. What is probably a factor of cost constraint are the little electronic farts that occur when the machine checks in a new disc. Once it's happy with that it will display a track count for about five seconds then the LCD will blink to '00'. In use it shows only the track, search mode and a little 'P' which flashes if you try to do something outrageous like skip from the first to last track backwards.

The transport controls are located on the compartment door and cover the usual functions in a slightly crude fashion, ie to scan rather than skip a separate mode button has to be pressed. The repeat mode is for the whole disc only and there isn't a programmable memory, but how many blaster owners use this feature anyway?

CASSETTE

Compact cassettes can be played by inserting them in a deep inverted compartment alongside the disc player; in fact it's so deep that you can't see the spools (something I find confusing but is probably just a matter of familiarisation). Unlike the disc player this source is as fully featured as most save that it's a uni-directional type. It has optional equalisation for chrome/metal tapes and will synchro-record off disc or air.

The transport controls have a mechanical logic allowing one to jump straight from fast forward to play which is common to most of the players on test, but not all. It omits a noise reduction system and record levels are set automatically.

RADIO

The styling of the *XL25*'s dial drags certain graphics quite a way from the actual wavelengths – almost to the point of confusion, but not quite. The actual dial cursor relationship is traditionally vague, which is common to many cheap radios and probably a means of disguising crude alignment. However, it does have a stereo beacon and tuning in by ear on FM is easy enough.

It has a full complement of bandwidths but don't expect too much from shortwave which is too packed for stations to be easily located.

SOUND QUALITY

The low cost of the CD player is partly reflected in the amount of motor noise that is audible even at a distance of five or six feet. However, its lack of pedigree is rather more obvious when you start listening because the amount of noise it creates is more intrusive than usual. In musical terms there's a ten-

dency to muddle things unless they remain very simple, and tonally it's mid forward and not surprisingly devoid of LF proper. One reason for its tendency toward musical congestion is the speaker cabinets, which are so flimsy that they add coloration by vibrating at audio frequencies. This, along with the noise from the player makes orchestral crescendos even more raucous than usual. Discs that are devoid of acoustic instruments suffer less obviously from these effects and are in fact quite listenable, even informative.

Commercial music cassettes sound quite bright and lightweight but reasonably detailed and musically competent, in fact The The's *Infected* almost sounds dynamic despite the machines lack of solidity. The higher quality of homegrown dubs isn't lost, these are reproduced with more depth and life, creating a tangible and gritty impression of the event.

The *XL25*'s radio is possibly the most attractive source, being considerably more open and lively than CD and with seemingly more depth and shape. Orchestral pieces work reasonably well, cellos sound quite woody but violins tend to thinness as is their nature on lo-fi. Sensitivity is below par, picking up 14 stations on FM against an average of about 17 for the site.

CONCLUSIONS

Given the Aiwa's low price its failings can almost be accepted, but what sets this apart from any other blaster and makes it relatively expensive is the silver disc playing source. This element is so poor that it's hardly worth having, and given that an extra £50 will buy a relatively impressive machine it cannot be commended.

GENERAL DATA

Size (h x w x d)	23.3 x 55 x 16.7cm
Weight, w/out batts	Approx. 4.1kg
Battery requirement	8 x 1.5v
Typical price inc VAT	£150

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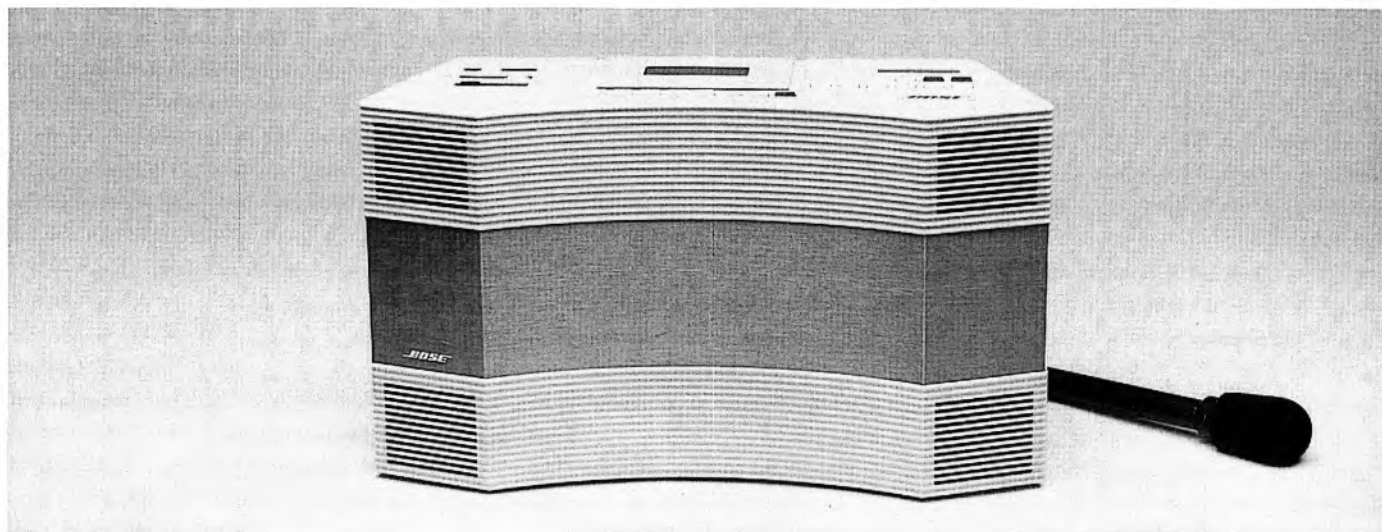
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Bose, best known for its large range of loudspeakers, has a separate UK division called Bose Consumer Direct. We first came across this satellite operation at last year's Time Out Live lifestyle exhibition where it was demonstrating the *Acoustic Wave*. It's not technically a yuppie blaster but it's close – I mean who needs a CD player, when you can have an Art Deco style wireless that plays cassettes?

The *Acoustic Wave Music System*, to give it its full title, is a little different from your run of the mill blaster not least because of its hefty £750 price tag and, most obviously, its highly unusual styling. Whilst the orientals are trying to produce plastic boom boxes that resemble nuclear submarines, the Americans have taken nostalgia to new limits by producing something that could have been designed 60 years ago.

However, the *Acoustic Wave* is more than just an expensive ghetto blaster; for starters the package doesn't include either a handle or a battery compartment. If you want to take it to the streets you'll have to find another £68 for a specially designed satchel which incorporates a battery pack and has mesh panels on the front to let the sound out. Again this is a pretty expensive extra, but it's tough and well made with large pockets for cassettes or the optional microphone! Yep, you read it right, one of the *Wave's* more practical features is that it can double as a PA system. Bose produces a microphone which connects up to the phono inputs and can be used to amplify voices and/or instruments. The sound quality isn't exactly natural but, unlike the vast majority of PA systems, it's reasonably clear at fairly high levels. One slight disappointment, considering the Japanese market, is that one can't sing along to a tape Karaoke style – a popular pastime in the land of the rising microchip.

One of the most appealing aspects of this machine is the simplicity of the controls and their layout. Even given the fact that there's one less source than on the other players the *Acoustic Wave* is significantly more user-friendly and approachable.

All the functions on this player, and some

are quite unusual, could be utilised without recourse to the instruction manual. There's also no need to select source as radio comes on straight away and tape overrides it when play is pressed.

Other functional novelties include tone controls for bass and treble which will reduce output but not increase it, an input for external line level sources, and not least, a seven foot folded horn for the single 4.5inch mid/bass driver. Bose calls this an *Acoustic Wave Guide*, and it accounts for at least two thirds of the ABS cabinet and creates remarkable bass extension for such a small internal volume.

CASSETTE

In line with the clean and simple approach of this blaster the cassette has almost the minimum of buttons and switches, resorting to automation for all but the transport controls. In the case of tape type equalisation this is fine, dandy and very useful, but when applied to recording levels it has a tendency to compromise results through unnecessary compression. The final inescapable aid to ease of use is Dolby B noise reduction. Of all these functions it's the one which should be switchable, so that those of us who can handle a little hiss could enjoy some HF headroom.

RADIO

One of the *Acoustic Wave's* most appealing attributes is that it has presets. It seems like the most obviously useful thing to put on a radio and even the cheapest in-car units have them, yet only the most expensive portable radios are endowed with them. This one has six for each band (AM and FM), and presetting them is a simple matter of tuning in manually or by autoscanning and pressing the desired button for about two or three seconds until it beeps. At the test site, using the scan function, the tuner pulled in seven stereo and as many mono stations on FM, manual tuning would no doubt have dragged in a few more.

SOUND QUALITY

The folded horn style bass reproduction sys-

tem does go some way to justifying the high price of this player – it definitely reaches depths that other ghetto blasters don't even hint at. This gives everything that's played a real sense of substance and depth, and with the right material it creates a good impression of imaging and works quite hard at giving music some plausibility and presence. On tape the constant presence of noise reduction has a rather damping effect on harmonics and high treble which takes some of the sparkle and life out of otherwise impressive pieces. It replayed tapes of more down to earth quality with varying degrees of success. A home-made REM dub displayed good stereo and had appealing punch and drive, but both vocal and guitar lost some of their edge as a consequence of the rolled off top end.

Playing CDs through it is slightly hard going for some reason. It sounds very snappy and tight compared to tape but at the same time long term listening is quite fatiguing. Recording off-disc on Type I results in a loss of bass depth and a less agile gait, but using chrome produces more HF detail and gets closer to the original. All round it sounds more refined than normal tape.

Off air sound quality can be quite impressive with a powerful local signal. Tracks with a heavy bass content can get a bit lumpy and over the top but reducing LF output goes some way to reducing this emphasis. Lightweight material and classical music works remarkably well.

CONCLUSIONS

The Bose *Acoustic Wave* represents a totally different approach to the portable music source, being remarkably versatile and at the same time easy to use. Only its price tag stands between it and global domination – well almost.

GENERAL DATA

Size (h x w x d)	26.2 x 45 x 18cm
Weight, w/out batts	10kg
Battery requirement	10 x 1.5v
Typical price inc VAT	£749

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The Grundig brand seems to be going through something of a relaunch in the UK, what with the slick *Fine Arts* system which amongst other expensive components incorporates a DAT player. The *RR9000 CD* bears the legend *Studio Line*, a name which unfortunately was also used for some rather catchily advertised hair product or other, but I won't let that sway me.

The *9000* is obviously an attempt at making a slick yuppie blaster – it's reasonably small and isn't absolutely bristling with controls, but it's far from short on legends decrying its various attributes.

It does have one ace up its sleeve however, in the form of the most comprehensive remote control I've yet to come across. It looks like the remote from a mid-price CD player and even incorporates volume control. This last element really is funky as it operates the motorised volume pot which flashes a red light as it's being adjusted – you can almost see why people buy midi systems. The actual volume knob only sticks out a few millimetres, which makes it difficult to use, but I guess the remote's so attractive that you're expected to use that all the time.

General features are quite sparse – no graphic equaliser or bass boost, just a pair of tone sliders, a 3.5mm 'phones jack, condenser microphone, CD out and an auxiliary input. It does have that bane of the species – a handle which can't be used unless the aerial has been retracted, not a disaster but sloppy nonetheless. Another ergonomically poor detail is the source selector which sits at the bottom of the fascia for maximum inaccessibility and is poorly marked to boot. That's OK if it's at eye level in a light room but under other circumstances is less than handy.

COMPACT DISC

The digital disc player is to all appearances like any other, in fact it looks a lot more basic than usual with only play, stop and skip/scan buttons, so I'd suggest you don't lose the remote. The remote covers the majority of functions found on most domestic players and includes a ten key pad for direct

track access which is something of a boon by blaster standards. With this you can call up introscan, one of two repeat modes and programme the 16 track memory; it also repeats the controls on the machine.

Displaywise the *9000* sports a simple LCD affair which shows track count and total time on insertion of a disc, and track and elapsed time when in play mode. The transport itself is a little noisy but not too obnoxious, unlike certain players mentioned elsewhere in this review group.

CASSETTE

In line with current blaster design theory the control buttons for the tape and CD are placed in a different plane to the mechanisms themselves, which to the uninitiated seems slightly illogical but not tragic. Anyway enough of generalisations, back to the fully fledged cassette deck which features three mode autoreverse and normal/metal tape type switching. It will of course synchro start CD recordings; just select CD on the obscure source switch and press the one touch record button – almost foolproof.

Record levels are automatic and there's no noise reduction system to fuss with even if you want to. Given the standard of such devices when they're attached to anything less than a good separate player this is a plus point. The transport controls are a little basic, for instance you can't jump from fast-forward to play which is a bore and figuring out which way the tape is running is tricky – an illuminated arrow by the controls would be very helpful here.

RADIO

The displacement of the tuning dial and associated controls ain't too hot either, although the side mounted tuning knob is quite easy to use. The band select could be clearer and the cursor could be a lot brighter – in less than bright conditions it's virtually invisible so tuning will have to be done largely by ear. One unusual and handy feature is shortwave fine tuning which makes picking out individual stations on this jam-packed wavelength somewhat easier.

SOUND QUALITY

The *9000's* disc player is, I suspect held back by the amp and speakers it feeds, which have very limited LF extension, and consequently the machine tends to produce rather thin, lightweight sounds. With jazz and classical music this thinness pervades the presentation to the extent that it sounds bright and shallow with very little body or substance. It can sound lively and play tunes but not in a very convincing manner. However, a Tom Tom Club track didn't sound too bad, its bass heavy balance sounding tight and in time, but Michael Hedges' acoustic guitar sounded dead, so short on shape and ambience was the rendition of this harmonically rich disc.

Replay of cassettes, especially quite good ones (in information content terms) with limited instrumental bandwidth can sound reasonably bold and lively. But musicassettes, although quite jaunty, suffer slightly from the lack of noise reduction and reveal both wow in the sense of instability and apparent speed error – it plays too fast and can sound overly aggressive at times. This character spreads to the CD recordings it makes, which lose a lot of subtle information.

On the reception front it proved itself pretty sensitive, pulling in a total of 23 FM stations and overloading slightly with the very strong ones like Capital. Sound quality is nothing special; it's neither bland nor outstanding, just competent.

CONCLUSIONS

The *Studio Line* is marginally slicker in appearance than other yuppie blasters but it's sonically too bandwidth limited to be really competitive. Admittedly, the remote is pretty flash and the motorised volume control rather appealing, but it's debatable that they are worthy of the rather high price tag.

GENERAL DATA

Size (h x w x d)	16 x 58.5 x 17cm
Weight, w/out batts	5.1kg
Battery requirement	8 x 1.5v
Typical price inc VAT	£300

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JVC PC-X300

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The model name for this veritable beast is totally inadequate for such a big mother of a blaster – it should have been called 'Disczilla' or something equally inane. *PC-X300* sounds like some sort of go-faster policeman.

It has one unusual feature – removable speakers, lightweight boxes which slide onto the player and are connected with short (1m at a stretch) skimpy wires to spring clip terminals, leaving the big footed body of the machine looking like some funky midi system. Given that these players largely end up in domestic situations this is a half decent idea that doesn't compromise the unit's portability – it merely leaves some bits of wire trailing in the dirt. Presumably it also means that you can hook up alternative speakers, which should improve matters.

On the general features of dubious merit front the *X300* is, as one might expect, quite adequately equipped. For starters we have a five band graphic equaliser (which is one more than the assembled competition), a mixing mic input and a phones output (both 3.5mm jacks) and even a 75ohm antenna terminal (the roof mount type) for bare wires rather than a coaxial socket. A suitable aerial, including installation, would set you back £30 or so which is justifiable given the cost of the machine and the improvement a good signal can make to sound quality. Last, but not necessarily least, is a 3-D button which switches in Hyper Bass (or hyped bass if you prefer) and connects up the single bass driver inside the player. One thing that it doesn't have which one would expect on a player of this price, is a clock.

COMPACT DISC

Another top loader whose lid hits the handle if it's left up, the *X300* gives a track count and total time readout upon insertion of a disc. Whilst playing back CDs it shows track and elapsed time but offers no alternatives on this front. The transport controls look fairly basic but both skip and scan can be carried out with the same buttons – you can repeat one or all tracks, introscan and use random playback for a bit of variety. Up to 20 tracks can be quite simply memorised so you can

play your favourite tunes from an album.

One unappealing factor is the amount of noise that is created by what is presumably the motor.

CASSETTE

Never short on features the *X300* is fitted with two cassette decks, one for playback only and the other for recording – what a dubwise society we must live in! There are, however, a few rare extras on these decks including switchable Dolby noise reduction and chrome/metal equalisation which apply to both decks for both record and playback.

RADIO

The tuner sets this particular black, plastic box apart from the others almost as much as the removable speakers. It has a digital display and, wait for it, presets – yep, five buttons which will each store a frequency from the long wave, the medium wave and twice on FM giving a potential 20 station memory. Tuning in stations appears to be a totally manual affair with no scan facility which is a bit of a nuisance – it doesn't have any output in search mode so you have to have a reasonable idea of the frequency you're after.

SOUND QUALITY

Initially listening was carried out with the speakers detached for the potential benefits of better imaging and reduced vibration of the player. However, in practice these advantages are outweighed by the boxy colorations caused by the very flimsy plastic cabinets. Whenever music gets lively they really start to sing along which isn't that desirable. Sliding them back onto the body of the machine adds some rigidity and improves the sound.

Without the extra *Hyper Bass* driver it sounds rather anaemic so this was left on for the listening – it can get a bit over the top with certain material but on the whole is an aid to musical enjoyment. The standard of fidelity achieved with compact disc is not as impressive as one might have hoped for from such a physically imposing machine. Admittedly it does play painlessly at a higher level than cheaper machines but it has a tendency

to sound rather flat and lifeless. The relatively good bass extension makes up for quite a lot, adding substance and sometimes even shape to instruments. In fact Michael Hedges' guitar playing managed to retain some of its attack and harmonic ambience and consequently sounded quite good.

With cassettes the non-record tape deck proved a lot more stable than its mate and was used for listening to prerecorded tapes which, on the whole, sounded pretty good. Its character is on the live side of neutral with rather limited dynamic range – in fact low level listening proved rather uninspiring and higher than usual volume was used which may have helped the informative impression that it makes. Recording off disc and tape is marred by the rather high wow levels created by the record ready deck, but otherwise sound quality is quite acceptable with relatively low detail loss. Chrome tape sounded considerably brighter but not a great deal better and is probably not worth the extra cost.

Getting a station count was a slow process as one has to go through the band half a meg at a time in order not to miss any obscure stations. Of course this meant that one couldn't easily run past stations and contributes to the unusually high count of 15 mono and eight stereo broadcasts picked up. Soundwise, FM is big and lively with a bright balance which can make instruments like piano sound a little harsh but doesn't bother pop/rock too much.

CONCLUSIONS

The *JVC PC-X300* is a pretty flash blaster with a comprehensive selection of features and facilities, including radio presets which are very handy. The sound quality it offers isn't really that impressive given the fairly hefty price tag but it's better than most.

GENERAL DATA

Size (h x w x d)	24.3 x 67.2 x 23.6cm
Weight, w/out batts	7.5kg
Battery requirement	8 x 1.5v
Typical price inc VAT	£350

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A quick phone call to your Shop to find out whether you had them in stock and I was lectured on how a Music System should be purchased . . . "Have you listened to it? How do you know you will like it's sound? It isn't the same as buying a washing machine, when it has to be taken on faith that it will do the job as you want it. It is more like buying a musical instrument, where personal preference dictates. You do not need to be an expert, you only need to listen to it and decide for yourself . . ."

Not too keen on the lecture, I was, none the less, taken up by what he said, and decided to pay you a visit. This turned out to be QUITE AN EXPERIENCE! After listening to a few systems I had already decided I would be buying my own combination and not the one recommended in the magazine. A music system should, indeed, be listened to, before purchasing. In addition, the personal attention, friendly, untiring and "non pushy" attitude of your sales assistant, Jas, turned the daunting prospect of choosing the right hi-fi into a most pleasant experience.

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

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JVC RC-X510

JVC (UK) LTD., ELDONWALL TRADING ESTATE, 12 PRIESTLEY WAY, STAPLES CORNER, LONDON NW2. TEL: (01) 450 3282.

RECOMMENDED



The *RC-X510* seems to be a fairly chunky, black, plastic blaster surmounted by a CD player lid that resembles the windscreen of some mean sports car. This £200 yuppie blaster is fairly flash, with 'Hyper Bass Sound' slots which put out something pertaining to low frequencies, and has all the usual trappings: three band graphic, CD output sockets, headphone and mix mic socket, etc but little that's out of the ordinary. I guess at the price it's doing pretty well to have that much and two tape decks, a CD player and a radio – in fact, what more does one need? Good sound perhaps, but it may well have that as well, we shall see.

Ergonomically it has the usual pitfall of cassette controls by the CD transport and vice versa. It also features one of the least groovy volume controls of the group – a slider with a 2cm operating range, only half of which is usable before noticeable distortion sets in, so setting volume level has to be carried out more carefully than usual. This isn't disastrous of course, just a little crude. From a styling point of view the *X510* is a little blacker than usual and to my mind slightly tacky in places, although the tape doors are quite slick. Physically it's fairly squat and offers reasonable perceived value for money, especially if you dig *Hyper Bass Sound*.

COMPACT DISC

The disc player's smooth style lid has the usual problem in that it hits the handle if opened when the latter is up. In use the player is pretty regular, displaying track count and total time on disc insertion and track plus elapsed time on playback. The same buttons allow skip/scan whilst some rather small and close buttons instigate introscan, random order play and repeat for the current track or whole disc. It even has a 20 track memory which is straightforward to programme; just find the track whilst the disc is static, press the button and hey presto it will remember it, unless you do something rash like open the disc compartment.

CASSETTE

The *X510* is comprehensively equipped with

a brace of cassette decks; one is a basic play, forward and rewind type while the other has a record facility. For those would-be copyright pirates it will synchronise recording from either another tape or a CD, or so the logos proclaim. There are even numbers beside the appropriate buttons, but they don't seem to have the appropriate effect. This is where an instruction manual would come in handy, but being review stock or a very new model it didn't have one. However, dubbing from CD is pretty straightforward and so is making tape copies, but not synchronously, ie pressing play/record on one deck starts up the other, pressing the buttons marked 1,2 and 3 in order or simultaneously just initiates play on deck A.

There's no noise reduction system but it does have alternative equalisation and high speed dubbing for those of you who inhabit the fast lane and aren't too fussy about sound quality.

RADIO

The *X510* sports a fairly unassuming dial with four bandwidths and a tuning knob mounted on the side of the cabinet which from an ease of use point of view seems a very practical proposition. It has the usual crummy cursor about half an inch away from the FM wavelength markings for minimum visual assistance, and doesn't have a stereo beacon either so tuning is a pretty hit-and-miss affair. However, it's quite easy to find FM stations and there is mono switching for weak stereo signals. SW tuning has the advantage of a fine tuning facility right next to the dial.

SOUND QUALITY

For the sake of something vaguely similar to low frequency extension, *Hyper Bass* was switched in for listening to all sources and virtually always proved preferable – in fact in one case the entire bass line disappeared when it was switched out. When playing discs the sound quality remains acceptable, if occasionally unnatural. But Claudio Arrau's piano playing could even be described as sounding subtle, that is until things reach a crescendo and the image cracks up and gets

unattractively distorted. When the going gets tough, yuppie blasters get noisy.

The cassette decks are both fairly competent, able to make the most of a good tape and not obviously weak in speed stability terms, unless stretched by long piano notes or the like. Some tapes do sound a little fast and others can sound thin at times emphasising higher frequencies, but this is probably due to azimuth differences. The *510* works well with commercially made tapes which is a good sign alignment-wise and managed reasonably open and musical renditions of both classical and jazz. Recording off disc onto ferric tape brightens up the balance and loses a fair amount of information, especially at LF, but tape to tape dubs are less obviously compromised. Chrome tape is brighter still and marginally more open and detailed, but not really worth the extra cost.

The tuner sounds pretty average but is at least reasonably sensitive, picking up a total of 19 stations on FM at the test site. The stations themselves don't vary greatly in quality despite differences in signal strength. Radio Three, a relatively weak station, tends towards blandness whilst Capital, at the opposite extreme, is tight and punchy but a tad distorted at high frequencies – probably due to overload.

CONCLUSIONS

During the course of this review I developed a liking for the *510* – it's not particularly stunning in any one respect but is generally pretty competent. It must be said that I'm slightly swayed by the pseudo LF of *Hyper Bass* and find the chunky shape quite appealing, but given the price it's not a bad deal and warrants Recommendation.

GENERAL DATA

Size (h x w x d)	19 x 60 x 23cm
Weight, w/out batts	approx 7kg
Battery requirement	8 x 1.5v
Typical price inc VAT	£200

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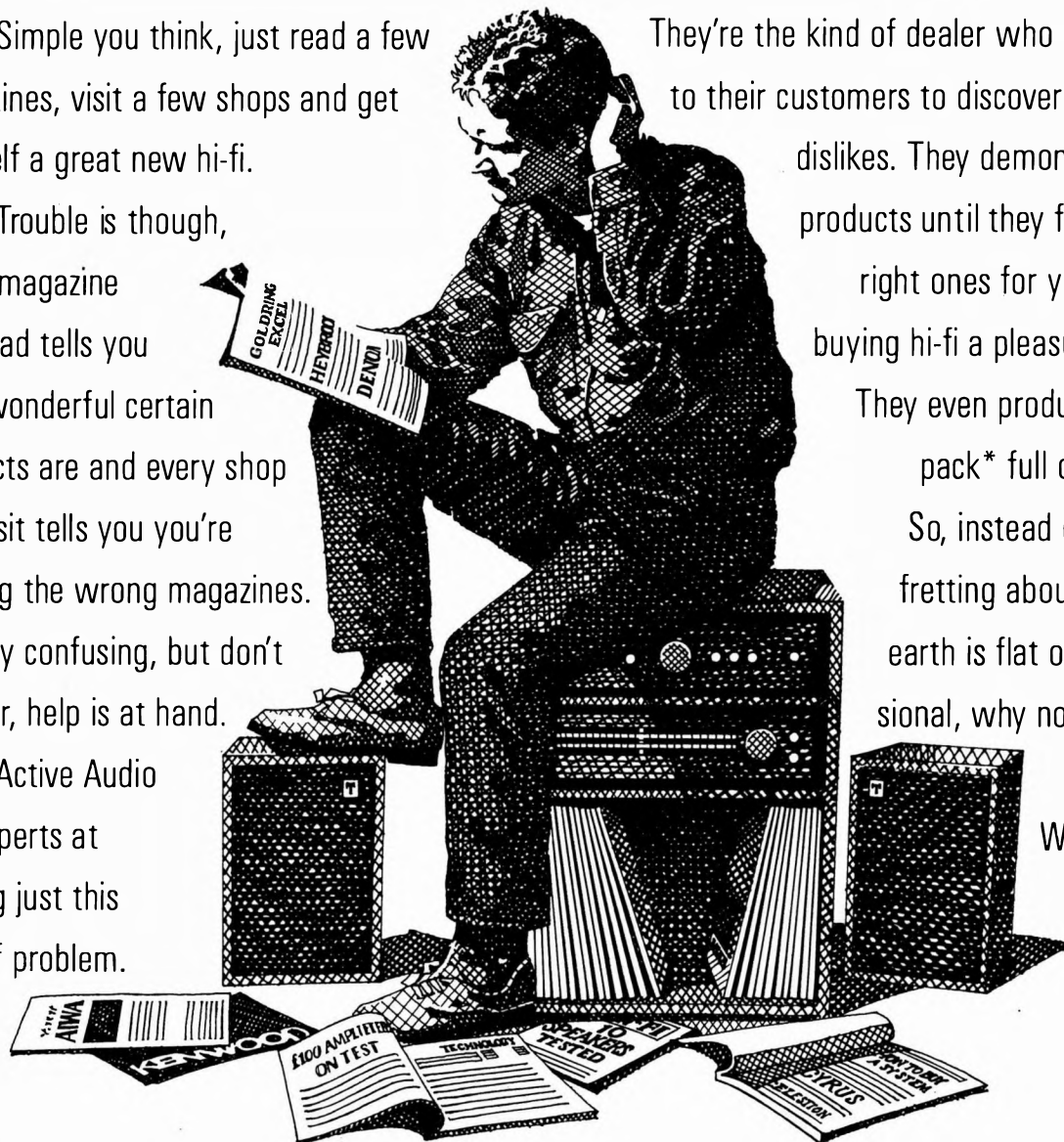
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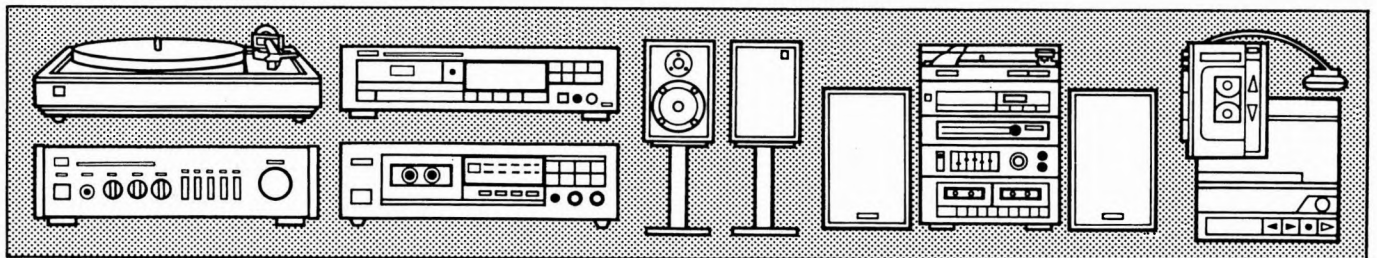
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PHILIPS AZ8394

PHILIPS ELECTRICAL LTD., CITY HOUSE, 420-430 LONDON RD., CROYDON, SURREY CR9 3QR. TEL: (01) 689 2166.



At the press launch for this somewhat uninspiringly named blaster the Philips PR agency decided to christen it *The Beast*. The invitation depicted some Charles Atlas type staggering under its colossal weight – full marks for imagination, but perhaps the *Space Invader* would have been more appropriate. It looks just like those bug-eyed meanies that used to rush across the screens of early arcade games. In fact it's probably the most stylish player in the bunch, and its amorphous look is to my taste quite appealing. It is also at the forefront of fashion this year, and looks likely to set the trend for brown goods for quite some time.

As befits a £200 yuppie blaster the AZ8394 has a whole host of features including a three band graphic, CD output sockets and DBB – a variation on the theme of bass boost that extends and lifts LF, which while not the most purist of practises is quite appropriate to the majority of popular music with this medium. For instance Neneh Cherry's excellent *Buffalo Stance* just doesn't sound hard without it.

It even has a built in microphone which works fairly well if somewhat unnaturally, ie on the recording made in the *Choice* office JB could just about be identified as JB and I sounded dreadful – the usual reaction. Mirror imaged with the mic is a 3.5mm headphone socket, just in case you should want to listen on the tube and marginally cut down on the irritated stares.

COMPACT DISC

The top loading disc player has a natty lid with a semicircular window which means that it's possible to identify the disc in situ, something which very few CD players let alone blasters allow. The transport buttons have a rubbery finish and an appealing tactile response – they actually move when they're pressed. Apart from the usual skip and scan functions, the former described as 'next' and 'previous', it has introscan and a 24-track memory. The programmed tracks can even be previewed on the track-only LED with a press of the display button. The transport itself is pleasantly quiet which is

unusual for a machine of this price.

CASSETTE

The *Beast* is kitted out with two cassette decks, each with different but complementary abilities. Deck A on the left will record from any of the other inboard sources, and does so synchronously with all but the radio. It can't equalise for chrome/metal tapes and lacks a noise reduction system, but is otherwise well equipped. Deck B is a two mode autoreverse contraption that will play in full loop or one side then the other modes, it even has little illuminated arrows to indicate direction but these only come on when it's playing. The decks have the usual aid to low fidelity: high speed dubbing, which no doubt is considered essential if the punter is to be impressed.

RADIO

The AZ8394's tuner is equipped with an unusual edge-on knob which almost matches the radius of the case, aesthetically a nice idea that doesn't seem to compromise ergonomics too much, and it means that subtle tuning is easier than dashing across the dial. The dial itself is of the usual vague variety with the FM scale a good half-inch away from the cursor, but with practise it's possible to find stations pretty quickly. Useful extras include a stereo beacon and a mono button, plus of course another three bandwidths of which two at least are usable. On test it picked up 16 FM stations at the London SE11 site.

SOUND QUALITY

The CD player suffers from a rather clogged up, inhibited presentation which seems to rob music of vitality and enthusiasm. The bass boost does give rock and pop some extra weight but adds to the thickening effect too. It can also make many varieties of bass note sound rather too similar, but if highly regarded hi-fi can't produce dynamic bass then it's a bit much to expect of a blaster.

Even when things get quite frantic CDs don't actually sound painful and despite the lively cabinet, muddling isn't too damaging to

musical structure – it just lacks life, and believe me these machines are capable of far worse. Given a good quality tape such as a studio copy of the Steve Berry Trio the cassette player can do quite a reasonable job of producing lively, almost detailed music. In fact a tape of this quality easily outshines most CDs in all but the bass which is relatively soft. More down to earth dubs sound very much like the radio, ie a bit small and compressed. Recordings off disc are a bit of a mess and sound thick, blurred and dull but they are just about listenable. Tape to tape suffers considerably less, just getting a little softer and less informative.

The radio can sound quite effusive given a tough signal and has more air and life than CD, but lesser broadcasts tend towards one dimensionality and don't put this machine above the norm. But after all, the norm is what most of us live with – so it's really not a problem, is it?

CONCLUSIONS

I found this one of the more attractive blasters in the bunch and if merit were based on styling it could have done well. However, at *Choice* we are concerned with sound quality and in this department the disc player lets the side down. Not disastrously, but enough to bring its rating down to just below Recommendable.

GENERAL DATA

Size (h x w x d)
Weight, w/out batts
Battery requirement
Typical price inc VAT

18.5 x 65 x 20cm
Approx. 5.5kg
8 x 1.5v
£200

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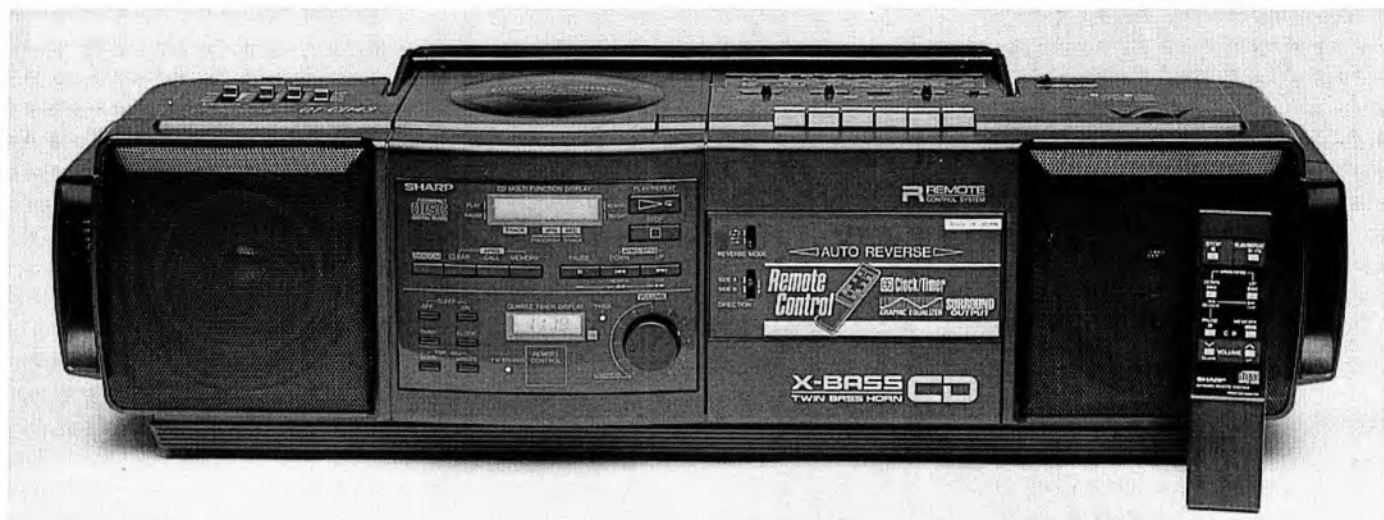
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SHARP QT-CD43

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The Sharp QT-CD43 is one of the beefier and less subtle looking machines in the group. For a start it's very black and long with little of the curviness prevalent in other machines. However, there is some in the form of a shiny convex panel on the fascia which houses the electronic controls and displays. But still it's hardly beautiful, in fact it's quite brutal. Why don't they make these things in pink or light grey or both. In fact what on earth is so groovy about black – it's macho, daunting, aggressive and in tune with about one in a thousand interior decors. I've noticed that cheaper products of this ilk often do come in bright colours, so how long is it going to be before the Japanese start believing that black doesn't mean audio credibility?

But what of the boringly titled QT-CD43? Not surprisingly it has a few novelties up its sleeve to turn the punter's eye when he's faced with a wall of such blasters. The most heavily pushed of these is the remote control, a fairly neat little device which repeats the disc control keys on the player itself and controls volume. This it does in an appealing if gimmicky fashion by inspiring the motorised volume knob to rotate. Unlike the Grundig's, the light on this knob stays on constantly rather than flashing when it's on the move, but it's still quite pretty. The other non run-of-the-mill feature is a surround mode with the option of using external loudspeakers by hooking them up to the 3.5mm jack sockets provided.

One other non standard and fairly useful add-on is the digital clock which has a timer function to wake you in the morning, or maybe even record off-air in your absence.

COMPACT DISC

The top mounted disc transport is controlled by an array of buttons set in the curvy front panel which carry out most of the usual functions by some means or another. For instance, scanning can only be carried out if the player is in pause mode and the 20 track memory once initiated cannot be escaped from whilst the disc's playing. But otherwise it's fairly straightforward with all, or one track repeat and random play. What's more

the latter actually behaves randomly, which can be a bit of a nuisance if you don't want to hear the same track twice, which occurred on test. The remote handset will instigate all but the last two instructions but is perhaps most useful as a volume control.

CASSETTE

The single tape transport on the CD43 is a two mode autoreverse device which will either play/record in a loop or a side at a time. These modes, alongside direction, are controlled with rather crude plastic levers that stick through the compartment door, but they work okay. One drawback is that there's no direction indicator which can be very confusing if you're trying to find a specific track – it does however, have a music search system which makes this task slightly less painful.

There is a button for different tape types but this only applies to playback, recordings have to be put onto ferric tapes. Mind you, going on the form elsewhere this is unlikely to be a disadvantage.

RADIO

The CD43 features a four band tuner laid out in the usual vague fashion, the edge-on knob sitting on top of one speaker and the marginally clearer than average dial about four inches away under the handle. On FM at least it seems to be reasonably well calibrated but the scaling is so basic that it doesn't make a great deal of difference anyway.

FM sensitivity is about par for the group, managing to pull in 17 listenable stations, of which seven were in stereo according to the beacon.

SOUND QUALITY

First of all the CD player which with the sub aqua sensation *Boom Boom Chi Boom Boom* by Tom Tom Club sounds a bit warm and thick but reasonably out of the box. Pressing the surround button expands the imaging by emphasising treble and livens up this type of music quite nicely – it's obviously unnatural but with electronic music this isn't a problem. Surprisingly enough classical music

doesn't suffer too badly as a consequence of the surround option either. Without it the sound is dense and veiled, even plummy at times and, switching it in brings the music out of the box but not surprisingly fails to imbue it with a sense of realism. Other acoustic recordings sound equally synthesised and slightly distorted, but not painful, which is a good sign.

Cassettes take on an almost mellow character, the Steve Berry Trio sounding quite reasonable with a degree of realism and good depth. Admittedly some wow is noticeable but it's far from distressing. Lesser recordings are commensurately flat and grey but can show some scale which seems to be this machine's major strength. Bass heavy tracks show up the lack of solidity in the cabinet but are otherwise quite listenable if a little undynamic. Recordings have much the same character – pretty flat and somewhat colourless but wholly listenable if one sticks to pop/rock type material.

The radio, like virtually all the others encountered on this test, can make a fair job of a powerful signal but gets compressed and dull with lesser broadcasts. The surround option has quite drastic effects on an Inner City soul track, which sounds very bright and tizzy with it, or small and in-box without, take your pick.

CONCLUSIONS

The QT-CD43 only has one cassette deck and is a bit lacking in LF but in general its sound quality is above average. It has such add ons as a clock and a remote control but whether these warrant the highish price tag is a matter of priorities. If it were a bit cheaper, ie around £200 it would have been worthy of Recommendation.

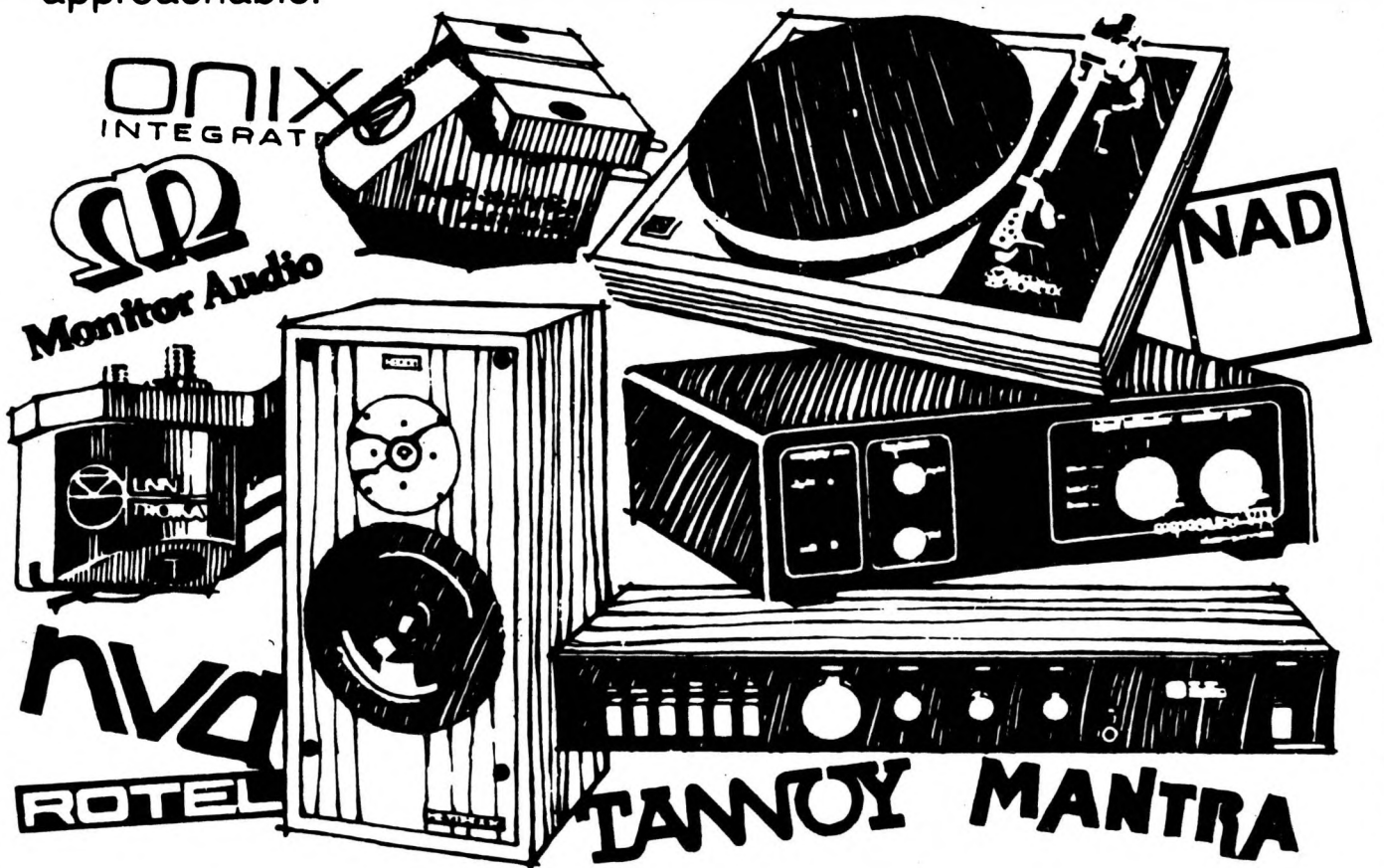
GENERAL DATA

Size (h x w x d)	18.6 x 66 x 22.2cm
Weight, w/out batts	Approx 6.5kg
Battery requirement	10 x 1.5v, 1 x AA
Typical price inc VAT	£280

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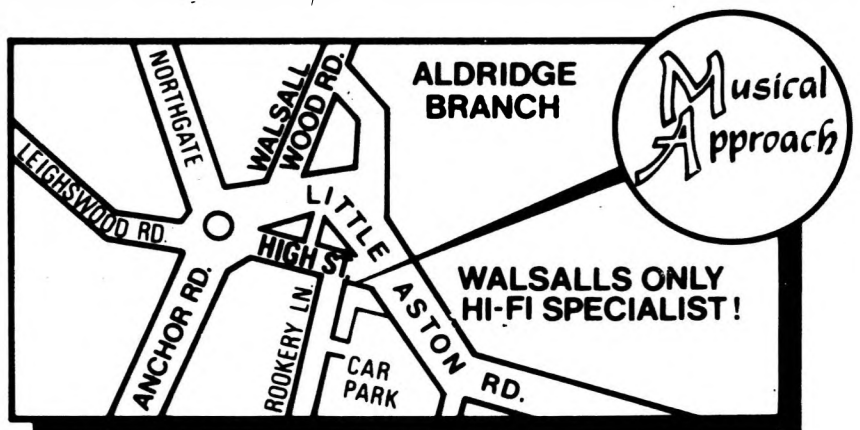
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SONY CFD-D73

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

RECOMMENDED



The *CFD-D73* is a very new machine to these shores, or at least it was when we chased Sony for it. Consequently the sample that arrived was a 100volt version with a manual printed entirely in Japanese. But it takes more than that to keep us from reviewing it – the voltage difference doesn't affect battery operation so eight HP2s were half-inched from the Bose bag and we were ready to roll.

But first a closer look at the *D73*. Physically it comes into the long and low category and has a relatively clean appearance. I say relatively because it's still got a good variety of logos splashed around it, most notably one that reads *DoDeCaHORN*. This is Japanese for *Megabass*, a Sony'ism for a bass porting system, and there are little vented triangular holes at either end of the cabinet which may well have something to do with this . . .

Whilst the *D73* only has a single cassette deck it is otherwise quite impressively equipped, and features a clock and a timer, although I couldn't fathom either of them without a manual. It even has little lights which indicate the selected source, a bit twee and obviously derived from midi systems but not objectionable and they did turn out to be quite useful. Also on the relatively useful front are holes for microphones, headphones and both outgoing and incoming signals. And whilst on the 'it-wouldn't-be-a-blasters-without-one' front we find a three band graphic equaliser, with LF, or at least 100Hz, penned in as the *Dodecazone*.

COMPACT DISC

This top mount player has the unusual distinction of the major transport controls being placed right in front of the lid, which would seem like a rational idea, whilst on the front of the box are secondaries such as skip, scan, shuffle, repeat, etc. This player even has an autospace function which leaves appropriate gaps on the tape, so that music search will operate effectively. The player breaks some other rules as well – for instance on disc insertion it doesn't give the disc a spin and consequently doesn't give a track count read-out on its LCD. At first this seems a bit odd, but if you think about the portable aspect

and battery life, it begins to make sense. Who needs to know how many tracks there are anyway? It tells you that on the disc and the jewel case.

In operation the display shows both track and time, either remaining or elapsed, and like the other Sony it's great for scratching.

CASSETTE

The tape transport is an autoreverse affair which operates in two modes; single side only and A then B. It's one of the few cassette decks in the bunch which is equipped with a music search facility, and this will scan for four-second low level gaps, which is pretty effective unless you listen to music which has very low level passages in it. One niggling detail is the poor positioning of the viewing slot – it's too low to be able to see how much tape is on each spool.

RADIO

This is where things get out of place and one's suspicions are aroused as to whether this really is the same model as will be sold in the UK. For starters it has a UHF band for TV sound reception, which is unusual but not outrageous, but what is strange is the FM scaling and an extra VHF band. Only the range 76 to 94MHz is marked as such, the rest of the band is marked with the numbers 1-3 which go up to 108MHz. And a second band on the barrel style dial is marked 4-12 and covers a frequency range that's devoid of broadcasting! It would seem unlikely that the European *D73* will be so pointlessly equipped, or am I missing something in the all-Japanese manual?

From an ease of use point of view it lends itself to fine tuning but not to quick dial scanning, as only about a third of the edge-on knob can be used. It has an AM section as well which is conventionally scaled and covers the medium wave only. Sensitivity is a tad higher than average, pulling in 18 FM stations at the test site.

SOUND QUALITY

The quality of disc playback is higher than the average, not that the average is so great

but this one ain't too bad. It has difficulties with well recorded acoustic instruments but the majority of rock and pop sounds remarkably listenable and occasionally powerful. Fair bass extension is one of the helpful factors as is a relatively competent sounding amplifier which doesn't start squawking at the merest sight of a loud transient or a subtle note.

Cassettes sound relatively crude as one might expect, but quite pleasantly open and rhythmically stable if not perfect, long notes can push it a bit far and reveal some wow. With some tapes there's a tendency to hardness which restrains acceptable listening levels and reflects HF distortion. The lack of chrome/metal equalisation is a bit of a nuisance for recording and playback and should really be fitted on a machine of this price. Recording quality off disc is slightly thin and inevitably hissy, and there is also some tendency to phasiness caused by transport instability, but generally losses are not that high.

FM broadcasts seem to be hampered by hiss and sound bright and frantic compared to disc; mono pirate stations are on the whole a lot more listenable. This aspect of performance is undoubtedly related to the intended Japanese market of this sample.

CONCLUSIONS

Certain features will undoubtedly change when the UK version arrives – perhaps least of all the legend won't be the whacky *Dodecahorn* but the established *Megabass* logo instead. Hopefully its sonic character won't change dramatically but it's the sort of thing that does tend to happen when models are tarted up for a different market, something to do with national tastes! As it stands we Recommend it; let's hope it doesn't change for the worse.

GENERAL DATA

Size (h x w x d)	17 x 62.5 x 20cm
Weight, w/out batts	Approx. 6.5kg
Battery requirement	8 x 1.5v, 3 x AA
Typical price inc VAT	£280

SONY CFD-DW83

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



The Sony *DW83* takes the amorphous space invader look to new limits. It's a very aggressive, almost militaristic looking machine that would blend in well on Darth Vader's sideboard. One particularly appealing bit of styling is of the volume and tuning knobs, mounted flatwise above the speakers, which not only look good but due to the finger indents are easy to use as well – full marks.

The *DW83* has a variety of novel features including a 3.5mm jack socket for a mixing microphone. Unfortunately I didn't have one to hand and couldn't check out its rap rating, but presumably you can sing, talk or even shout over a tape or CD though I wouldn't bet on it. One thing you can't do is mix between the different sources, not even between tape decks as one overrides the other. However, it's possible to 'scratch' with CD, ie play the same single second of music over again and get that 'wicky wicky' sound that DJs just 'lurve'.

Another rare feature is a balance control which conceivably could be of use but it's hard to imagine to whom. Considerably more useful are the auxiliary input sockets with which, assuming you had a player and amp, you could play and record LPs, but given the host of onboard sources it doesn't have that many other uses. One slightly irritating design fault that crops up on some blasters is that the carrying handle and aerial clash with one another. However, given that these beasts are rarely actually carried around I guess it's not a major problem.

COMPACT DISC

The disc player on this machine sits right at the top and has a rather flaky pop-up lid which clashes with the handle if it's been left up. The transport controls are located on the front in a different plane to the player, making them slightly inconvenient if the machine is on a low shelf. During CD operation the LCD display, which usually shows the 24-hour clock, gives track and time, either elapsed or remaining, but like many of its brethren it won't give a track count on initial disc insertion.

The other options are much as one would

expect from an inexpensive standalone player: repeat for one or all tracks, shuffle which plays tracks in a supposedly random order and a 20-track programmable memory – how on earth does the vinyl generation survive without such aids?

CASSETTE

On the tape front the *DW83* is quite well endowed, being equipped with two autoreverse decks, one of which will synchronously record from CDs or other tapes, the latter in normal or high speed modes. But we suggest that unless you're after that authentic bootleg sound (high speed dubbing was surely conceived with the mistaken idea that the public are concerned with quality and thus wouldn't buy copies made in this fashion – boy, do some people make mistakes) you steer well clear of this option.

Quite a neat idea that is incorporated into these decks is that each has two autoreverse modes, but deck A will either run in a full loop or one side then the other, whilst deck B will do the latter or run one side only. I suppose they could have incorporated all of these onto the record deck for total versatility, but they did at least put them on. The only other noteworthy omissions: a noise reduction system and alternative tape equalisation for chrome/metal tape, neither of which are likely to be automatic.

RADIO

The tuner offers either FM or AM bandwidths, the latter in effect is medium wave only, and these are illustrated on a short dial with the usual crude cursor – tuning really has to be carried out by ear rather than numerically. As previously mentioned the tuning knob itself is a fine device, however it's better suited to quick rather than subtle movement and care has to be taken to find weak stations. On our crude sensitivity test it scored slightly better than average, picking up eight stereo and nine mono stations.

SOUND QUALITY

After a quick fiddle with the four band graphic a reasonable balance was achieved

and listening could commence. With a bit of Liszt piano and orchestra, it sounded OK if not particularly natural, piano notes having a tendency to sound glassy and brittle at times, but the reasonable bass extension lends some substance and the *DW83* appears to have some dynamic range. A reasonable amount of info can be extracted from well recorded discs such as *Further Adventures* by Flim and the BBs, which sounds quite nimble outside of the bass, and this has a rather one note quality about it. Presentation seems to be confined to the box itself, a result of the none too rigid construction no doubt. Michael Hedges guitar sounds chirpy if a little skeletal and lacking in body and harmonics, but it is at least fairly dynamic.

With cassettes the sound is coherent and maintains a reasonable sense of rhythm but it could be more lively and enthusiastic – even the best tape I had sounded slightly thin and lacking in substance. Lesser recordings tend to shrink into the machine somewhat and have a rather 2-D feel. Recording from the onboard CD player results in quite noisy and rather compressed sound quality with low level information practically disappearing: in a word unspectacular. Tape to tape dubs are less obviously compromised and quite adequate, given the transparency of the machine.

With a strong signal the radio can sound fresher and more open than either of the alternative sources but it's on a par with cassette with more down to earth broadcasting.

CONCLUSIONS

A macho machine in looks at least, the *DW83* is sonically a little uninspiring but quite listenable and capable of fairly high sound levels without hideous distortion. Given the high price tag it should perhaps be better, so doesn't merit recommendation.

GENERAL DATA

Size (h x w x d)
Weight, w/out batts
Battery requirement
Typical price inc VAT

21.5 x 63.5 x 21cm
Approx. 8kg
8 x 1.5v, 3 x AA
£300

TOSHIBA RT-8089

TOSHIBA UK LTD., TOSHIBA HOUSE, FRIMLEY ROAD, FRIMLEY, CAMBERLEY, SURREY GU16 5JJ. TEL: (0276) 62222.



It's ironic that often when we decide to review a group of mainly Japanese products all the companies we contact are in the midst of changing models of that particular component type. This inevitably makes it difficult to get hold of review samples and in fact happened with these yuppie blasters. This particular Toshiba model arrived in good time, and then got collected before we'd had a chance to look at it, so that Toshiba could photograph it! It only just got back to the office in time to be included in this, the second and most stringent *Choice* CD-portable test.

The *RT-8089* is a very square piece of kit that features a silvery grey Nextel like finish in places, and makes the most out of a limited feature count. It comes close to the long and thin category and doesn't go in for the rounded amorphous look that many of the new machines are sporting this summer – either Toshiba is rebelling or its out of touch with the fashion.

Control layout is more rational than usual, with CD keys in the same plane as the disc and those for tape under the doors. The CD display, however, faces forward and the CD output sockets and jacks for mic and phones are on the side rather than the back which may well be a more practical position, depending on your set-up. The *8089* also has a quartz clock with a timer facility which runs off a single AA battery. Oddly enough it doesn't have a graphic equaliser, which is no great loss, but does have a balance control for what it's worth. Perceived value, given its £200 price tag, isn't that high – it's a little plain and devoid of any real style and the imitation Nextel is just a little too subtle to give it an edge in the looks department.

It does feature the only three mode switch in the bunch, a slider which covers the two dubbing speeds, mono/stereo on FM and AM beat cut which is an aid to recording on the long, medium and shortwave bands – not a bad line up for one switch.

COMPACT DISC

The lid on this admittedly very early sample is slightly skewwhiff which shouldn't affect

performance but looks a little unprofessional, but then I'm picking nits here as it's probably only the angle of the machine on the desk that shows it up. Anyway, the CD player itself is a pretty run of the mill gadget coming complete with an LCD display revealing track count and total disc time whenever a disc is inserted or CD selected. It has the relative luxury of separate scan and skip buttons and the ability to show both elapsed and remaining time/tracks. There's a whole disc only repeat facility and an easily programmable 16 track memory, making for a rather bland feature line up but if it helps the sound quality we ain't complainin'.

CASSETTE

On the reel to reel front the Toshiba has the usual complement of two decks, one which can record from any of the onboard sources or a microphone, and another which has two autoreverse modes; full loop and one side then the other – this second deck doesn't have a pause facility. One potentially handy option is that it will play both sides of one tape and then carry on with one side of another in the second deck, which means that you can have a total of three hours continuous music. However, it's low on features, it can't equalise for chrome or metal tapes and doesn't claim a noise reduction system, and record level is set automatically so don't get too hopeful about dynamics.

RADIO

The wireless has a remarkably readable dial, grey vertical lines help join up the blob-like cursor with the various wavebands. Apart from this inspired bit of graphics there is little else to say; it doesn't have such mod cons as a stereo beacon or SW fine tuning, but station hopping on FM is easy enough.

SOUND QUALITY

Whether it's the amp and speakers, the CD player or both, I don't know but discs played on this machine don't sound too hot. They all seem very level dependent and compressed, not dramatically so for the breed but definitely worse than usual. It can just about get

by with simple, tame music but as soon as a piece gets lively there is a strong tendency towards raucousness and distortion. One problem is the lack of LF-extension which leaves a rather lightweight bandwidth, another is the unnatural almost cardboard-like sound that acoustic instruments take on. If it were a cheaper machine this standard might be acceptable but given the competition it's hard to get enthusiastic or even positive about the Toshiba's disc playing abilities.

On the cassette replay side the autoreverse deck turned out to be the better sounding of the two, which goes against traditional theory, but then such theories are rarely based on blasters. It sounds obviously less distorted and thus more enjoyable to listen to. The standard of fidelity isn't that high, some tapes sounding oddly plummy in the upper bass and others less dynamic and life-like than usual. Generally its tape playing ability is on a par with other machines at the price – mediocre. Recording off disc on to ferric tape proved worthwhile if unspectacular, whilst dubs from another cassette were hardly impressive, quite poor in fact.

The stereo beaconless radio pulls in an average 16 stations off the frequency modulated band and produces sound quality that, given a healthy signal, is preferable to the other sources. It can sound a bit lispy but this is a common trait to inexpensive radios and not a major nuisance.

CONCLUSIONS

Not really a winner this one, one is liable to suspect that the CD player has doubled the price of what was once a standard blaster. If it had something approximating bass and better amplification/speakers it would make the grade, but as it is it ain't inspiring.

GENERAL DATA

Size (h x w x d)	17.4 x 63.3 x 20.8cm
Weight, w/out batts	5.4kg
Battery requirement	8 x 1.5v, 1 x AA
Typical price inc VAT	£200

SEVENOAKS HI-FI & VIDEO

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SUGGESTED SYSTEMS

The suggested systems priced below all include the popular Dual CS503/1 turntable but an alternative turntable or CD player is available at extra cost. Please see 'OPTIONS' list below for further details.

SPEAKERS
All systems priced include the Dual CS503/1

AMPS

AUDITION THE SUPERB RANGE AT SEVENOAKS HI-FI

MISSION 761 £119.95
INC. 100cm x 75cm STRAIGHT STEREO AND CABLE

MISSION 762 £179.95
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MISSION 763 £279.95
INC. PHASE 79 STRAIGHT CABLE

MISSION 764 £399.95
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MISSION 766 £799.95
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MISSION 768 £1199.95
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Rotel RA820B3	309.95	Goodmans Maxim II	319.95	Collection 3	339.95	T/Book PL 5	339.95	A/Research 122	339.95	Castle Dunham	389.95	Tannoy M00 (Bk)	399.95
Nad 3020E	299.95	W/able Delta 30	299.95	Goodmans Sterling P3	339.95	Rotel RA850	339.95	88W DM550	339.95	Collection DL5 II	389.95	Adt Acam 2+	439.95
Nad 3130	299.95	Mission 70 II	299.95	Royal A1	339.95	T/Book E11	339.95	Monitor Audio 917	339.95	J/Research 112	339.95	Tannoy DC 2600	439.95
Rotel RA840B3	249.95		279.95	Mission 81	339.95	J/Research 112	339.95		339.95		339.95	M/Audio P50MND	439.95
Marantz PM35	299.95		314.95		339.95		339.95		339.95		339.95		439.95
Rotel RA810A	299.95		314.95		339.95		339.95		339.95		339.95		439.95
QED A240CD II	249.95		279.95		339.95		339.95		339.95		339.95		439.95
Yamaha AX300	249.95		279.95		339.95		339.95		339.95		339.95		439.95
Arcam Alpha II	249.95		279.95		339.95		339.95		339.95		339.95		439.95
Rotel RA8708X	249.95		279.95		339.95		339.95		339.95		339.95		439.95
Yamaha M4400	249.95		279.95		339.95		339.95		339.95		339.95		439.95
Nad 3225	249.95		279.95		339.95		339.95		339.95		339.95		439.95
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OPTIONS

The following Compact Disc Player or Turntable may be ordered instead of the Dual CS503/1 in the above systems.

CDs

- Denon DC0810 add £80
- Denon DC0810 add £180
- Denon DC0910 add £180
- Marantz CD383 add £170
- Marantz CD751SE add £150
- Nad 5520 add £160
- Nad 5240 add £140
- Nad 2240 add £80
- Philips CD380 add £100
- Philips CD382 add £100
- Philips CD782 add £100

- Philips CD473 add £80
- Philips CD495 add £100
- Philips CD515 add £110
- Yamaha CD29 add £150
- Yamaha CD29 add £150
- Rotel RC0808 add £120
- Technics SP202 add £80
- Technics SL233 add £120
- Technics SL235 add £170

TURNTABLES

- Dual CS505-3 add £60
- Dual CS530 add £100
- ART EP 101 add £170
- Nad 1220 add £150
- Revolver Regal add £80
- Systemdek + arm add £150
- Systemdek + arm add £150
- Ariston CD Deck add £130
- Ariston CDN add £170
- Thorens 1226 II add £50
- Thorens D156 add £60

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or (Dual CS505/3 add £25)



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- A Research A37 £159.95
- Arcam Alpha 1 £159.95
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Cassette Decks

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Midi Systems

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- Kenwood & Pioneer etc.

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DERBYSHIRE

ACTIVE AUDIO, 12 Osbaston Rd, The Spot, Derby. (0332) 380385. Arcam, Ariston, Celestion, Denon, Heybrook, Kef, Cyrus, Musical Fidelity, Marantz, Revox, Rotel, Rogers, etc, etc. Demonstration and home trial facilities. Account and credit cards. Ring for opening times and free 'Fact Pack'. BADA MEMBER **3113**

ESSEX

A.T. LABS, 442/4 Cranbrook Rd, Gants Hill, Ilford. (01) 518 0915. Mon-Sat, 10-6. Two single speaker dem rooms. Access, Amex, Visa. BADA MEMBER **3114**

RAYLEIGH HI-FI, 44a High Street, Rayleigh, Essex. (0268) 779762/747571. 216 Moulsham St, On-the-Parkway, Chelmsford, Essex. (0245) 265242. A&R, Audiolab, Beyer, BLQ, Cyrus, Celestion, Denon, DNM, Epos, Gale. Access, Visa. 3 years parts and labour guarantee on hi-fi systems. BADA MEMBER **3115**

BRENTWOOD MUSIC & HI-FI CENTRE, 2 Ingrave Rd, Brentwood. (0277) 221210. Alphason, B&W, Cambridge Audio, Denon, Harman Kardon, Marantz, QED, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9.30-5.30 (Thurs from 10am, Sat from 9am). Free installation, credit facilities. Access, Visa, Hi-Fi Markets. Service dept.

LYON AUDIO, 16 Peartree Business Centre, Peartree Road, Stanway, Essex CO3 5JN. (0206) 560259. Audiolab, Beard, Celestion, Oracle, Rogers, Denon, NAD, Rotel, J.A. Michell, Roksan, Marantz, Quad. Dem facilities. Mon-Sat 9-6. Installations. Credit facilities up to £1000. Access, Visa, Hi-Fi Markets, Eurocheque. Service dept available.

GLOUCESTERSHIRE

ABSOLUTE SOUND AND VIDEO, 40/42 Albion St, Cheltenham. (0242) 583960. A-R, Denon, Dual, Linn, Meridian, Mission, NAD, Rotel, Technics, Yamaha, etc. (Closed Wed). BADA MEMBER **3116**

AUDIO EXCELLENCE, 58 Bristol Road, Gloucester. (0452) 30046. Audio Research, Dual, Krell, Linn, Magneplanar, Naim, NAD, Yamaha and lots more. Closed Mon. BADA MEMBER **3117**

HAMPSHIRE

ABSOLUTE SOUND AND VIDEO, 4 Feathers Lane, Basingstoke, Hants RG21 1AS. (0256) 24311. A&R, Audiolab, Denon, Dual, Linn, Mission, NAD, Rotel, Tech-

nic, Yamaha. Dem and home trial facilities. Mon, Tues, Thurs, Fri 9.30-6, Sat 9.30-5.30. Closed Wed. Free installation. Credit facilities. Access, Visa, Connect, Amex, Diners. Service dept. BADA MEMBER **3118**

HAMPSHIRE AUDIO Ltd, 2-12 Hursley Rd, Chandlers Ford. (0703) 252827/265232. Quality CD and analogue agencies. 5 dem studios. Large free car park. BADA MEMBER **3119**

HOPKINS HI-FI, 38/40 Fratton Rd, Portsmouth PO1 5BX. (822155) 830753. Technics, Quad, Monitor Audio, Tannoy, Denon, Nad, Heybrook, Ariston, Onkyo, plus others. Dem facilities, appointments necessary. Access, Visa. 9-5.30. Open to 6 Thurs. Closed Wed. Service dept.

HERTFORDSHIRE

ACOUSTIC ARTS Ltd, 101 St Albans Rd, Watford, Herts. (0923) 45250. A&R, Audiolab, Denon, Magneplanar, Quad, Rogers, Meridian, TDL, Jadis, Krell. Mon-Sat 9.30-5.30. BADA MEMBER **3120**

THE AUDIO FILE, 40 Hockerill St, Bishops Stortford, Herts CM23 2DW. (0279) 506576. 9.30-5.30 6 days. Linn, Roksan, Rega, Naim, Denon, Mission, Cyrus, Marantz, Quad, Tannoy, Sony. 2 dem rooms. Home trial, free installation service dept. Interest free. Bada Charge Card. BADA MEMBER **3121**

ISLE OF MAN

ISLAND COMPACT DISC CENTRE, Parliament Square, Ramsey. (0624) 815521. Musical Fidelity, Sugden, Celestion, Harman Kardon, Teac, Castle Acoustics, Philips, A&R, JBL, Luxman, Bose, Sansui. Mon-Sat 9-5.00. Dem and home trial facilities. Free installation. Full credit, no limit. Access, Elite. Service dept.

KENT

JOHN MARLEY HI-FI CENTRES, 2 Station Rd West, Canterbury. (Canterbury) 69329. Also at Dover - (0304) 207562. B&W, Heybrook, Magnum, M.Y.S.T., Nakamichi, Pink Triangle, Rotel, Sansui, Technics, Quad. Dem and home trial facilities. Mon-Sat 9-5.30 closed Thurs. Free installation. Credit to £1,000. Access, Visa, Creditcharge. Service dept.

VJ HI-FI, 29 Guildhall St, Folkestone. (0303) 56860. Mon-Sat 9-6. NAD, Yamaha, Marantz, Cambridge Audio, Denon, Kenwood, Rogers, Dual, N.V.A., Quad. Dem and home trial facilities, free installation, credit to £1000. Amex, Diners, Visa, Access. Service dept.

PHOTOCRAFT HI-FI, 40 High St, Ashford. (0233) 624441. No. 1 in Kent for Linn, Naim, Rega, Roksan, Exposure, Onix, Epos, Royd, Creek. But before you choose equipment choose where to buy it. Dem room, appts. necessary. Home trial and free installation. Visa, Access, Bada Chargecard. 9-5.30 Mon-Fri (Wed & Sat to 5 only). Service Dept.

LANCASHIRE

MONITOR SOUND, 54 Chapel St, Chorley. (02572) 71935. A&R, Dual, Mission, Quad, Rogers, Rotel, Spendor, Thorens, Nakamichi, Yamaha, etc. 2 dem rooms. Open Mon-Sat, closed Weds. Free installation. Credit to £1,000. Access, Visa. Service dept.

LEICESTERSHIRE

SOUND ADVICE, The Sound Factory, Duke St, Loughborough LE11 1ED. (0509) 218254. A&R, Creek, Linn, Epos, Mission, Cyrus, Naim, Rega, Roksan, Rotel, J.A. Yamaha. Dem facilities, appointment reqd. Mon-Sat 9.30-6. Free installation. Credit facilities. Access, Visa, Amex. Service dept. BADA MEMBER **3122**

ALPHA AUDIO, 1-3 Guildhall Lane, Leicester, LE1 5FQ. (0533) 518597 or 530330. Aiwa, Akai, Ariston, Bose, Cambridge, Celestion, Denon, Harman Kardon, Musical Fidelity, Rotel, etc. Mon-Sat 9.30-5.30. Free installation. Credit to £1,000. Dem facilities. Access, Visa.

MJS HI-FI, 80 Stapleton Lane, Barwell, Leicester LE9 8HE. (0455) 469777. The Rock, Audio Innovations, Kelvin Labs, Snell, Helius, Sugden, Ruark, Concordant, Valdi, JPW. Our main aim is for our customers to enjoy music. Dem and home trial facilities. Mon-Sat 9.30-7.00. Free installation and service dept. Visa, Access.


THE LEICESTER HI-FI CO, 6 Silver Walk, St. Martins Square, Leicester LE1 5EW. (0533) 539753. 6 days 9.30-5.30. A&R Cambridge, Heybrook, Marantz, Mission, Musical Fidelity, Nakamichi, QED Hi-Fi, Quad, Revox, Roksan

"and oodles more". Largest selection in Leicestershire. 2 dem rooms. Home trial arranged + free installation. Credit facilities. Hi-Fi Markets, Access, Visa, Am. Exp. Service dept.


LONDON


A.T.LABS, 159 Chase Side, Enfield, Middlesex. (01) 367 3132. Mon-Sat 10-6. Two single speaker dem rooms. Service dept, car park. Amex, Visa, Access.


BADA MEMBER 

AUDIO T, 190 West End Lane, London NW6. (01) 794 7848. Mon-Sat, 10-6. Two single speaker dem rooms. Access, Amex, Visa. BADA MEMBER 

CORNFLAKE SHOP, 37 Windmill Street (just off Tottenham Court Road), London W1. (01) 631 0472. Mon-Sat 10-7. DNM, Epos, Koetsu, Marantz, Naim, PS Audio, Rega, Roksan, SME, Yamaha. 2 dem rooms, full delivery and installation. Credit facilities. Access, Visa.

COVENT GARDEN RECORDS, 84 Charing Cross Road. (01) 379 7635/7427. Quad, B&W, Meridian, Mission, Yamaha, Sony, A&R Cambridge, Nakamichi, Rotel, etc. Dem facilities - no appointment reqd. Mon-Sat 10-7.30. Home trial facilities, free installation. Access, Visa, American Express, Diners Club. Service dept. BADA MEMBER 

DOUG BRADY HI-FI, 14-18 Monmouth St, London WC2H 9HB. (01) 379 4010. Wide range of top specialist hi-fi from Britain, America and Japan. 3 Dem rooms. BADA MEMBER 

GRAHAMS HI-FI, Canonbury Yard, 190a New North Rd, London N1 7BS. (01) 226 5500. 'FBA Dealer of the year 1985'. Linn, Naim, Rega etc. £300-£3,000-£13,000. BADA MEMBER 

H.L. SMITH & Co Ltd, 287-289 Edgware Rd, London W2 1BE. (01) 723 5891. Aiwa, B&W, Denon, Dual, KEF, Ortofon, Panasonic, Sony, Technics, Yamaha. Dem facilities. Mon-Sat 9-5.30, Thurs 9-1. Credit to £1,000. Access, Visa, Diners. Service dept.


KAMLA ELECTRONICS, 251 Tottenham Court Road, London W1. (01) 323 274. Amadens, Ariston, B&Q, Gale, Inatech, JPW, Linn, Mordaunt Short, SME, Systemdek, Thorens, Townshend, Ruark, Wharfedale.


KJ WEST ONE, 26 New Cavendish St, London W1M 7LH. (01) 486 8262/63. Fax (01) 487 3452. Dem's by ap't, installations arranged, open mon-sat 10-6. Design, plan and install of multi-room systems. Arcam, Apogee, Audio Research, Audiolab, Audion, Cambridge, Croft, DNM, Epos, Ear, Harbeth, Heybrook, Krell, Linn, Linn, Magnaplanar, Manticore, Martin Logan, Marantz, Meridian, Mus. Fidelity, Naim, Pink, PS Audio, Quad, QED, Revox, Rotel, Rogers, Stax, Sonus, SME, Systemdek, Tannoy, Voyd, Zeta. Major Credit Cards.

RICHER SOUNDS 2, 6 London Bridge Walk, London SE1. (01) 403 1988. Major names in esoteric hi-fi, unusually matched to discount offers and special end-of-line purchases. Dem facilities, expert advice, free local delivery & installation (£500+), plus 2 Yr G'tee. Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-7, Sat 10-5. Access, Visa, Richer ChargeCard. Service Department.

RICHER SOUNDS, 2 London Bridge Walk, London SE1 2SX. (01) 403 1201/4710. The original bargain hi-fi store, now refitted; 100s of regular and special discounts on most budget/mid price major names. By London Bridge. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Open Mon-Fri 10-7, Sat 10-5. Access, Visa, Richer ChargeCard. Service Department.

MIDDLESEX


A.T.LABS, 173-175 Station Rd, Edgware, Middx. (01) 952 5535. Mon-Sat 10-6. 2 single speaker dem rooms. Access, Visa, Amex. BADA MEMBER 

UXBRIDGE AUDIO LTD, 278 High St, Uxbridge, Middx UB8 1LZ. (0895) 30404 (Multi-line). A&R, AR, Ariston, Creek, Cyrus, Denon, Dual, JPW, KEF, Manticore, Meridian, NAD, Nakamichi, Quad, Rotel, Wharfedale, Yamaha, etc. 2 dem rooms. Mon-Sat 10-6. BADA MEMBER 

HARROW AUDIO, 27 Springfield Rd, Harrow. (01) 863 0938. Mon-Sat 9.30-5.30. A&R, Aurolab, Cyrus, Denon, Dual, Heybrook, Linn, Monitor Audio, Musical Fidelity, Quad, Rotel, Tannoy etc. BADA MEMBER 

MERSEYSIDE

IN CONCERT HI-FI, 144 Seaview Road, Wallasey, Wirral, Merseyside. (051) 630 5055. Denon, Kenwood, QED, Alexander, Spica, Shan Acoustics, Monitor Audio, Tannoy, Audio Dynamics, Dual, Systemdek, Ortofon, Audio Technica, Target, Musical Fidelity, Alphason. Single speaker dem room. Home trial + free installation. 10-6 - closed Mon. Open till 8pm Thurs and Fri.

W.A. BRADY & SON, 401 Smithdown Rd, Liverpool L15 3JJ. (051) 733 6859. 'Largest choice of specialist Hi-Fi in N.W. £100-£20K'. All credit cards. 3 dem rooms. Closed Monday. BADA MEMBER 

PURE SOUND - Birkenhead 051 645 6690 24hrs. Acoustic Energy, Aragon, Audio Technica, Beard, Celestion, Deltec, Denon, Michel, Cyrodec, Ortofon, SME. Home demonstration a pleasure, plus evenings and weekends (Sundays by appointment).

RICHER SOUNDS, 69B Church St, Liverpool LI 1DN. (051) 708 7484. Virtually every major 'budget' name - small store with big discounts and special offers. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

NORFOLK

SOUND APPROACH, 161 Unithank Road, Norwich. (0603) 622833. Kuzma, Ariston, Castle, Denon, Exposure, Ion, Royd, NVA, QED, Roksan, Ruark, Revolver, etc. etc. Dem and home trial facilities. Mon-Sat 9-6.30. Free installation. Credit to £1,500. Visa, Access, Diners Club. Service dept.

NORTHAMPTONSHIRE


CLASSIC HI-FI + VIDEO, School Lane, Kettering, Northants. (0536) 515766. ADC, Marantz, Onkyo, Sansui, Teac, Harman Kardon, Pioneer, Proton, Ariston, Thorens, Mantra, Goodmans, Castle, JPL, Mordaunt Short, Selego TV, Monitor Cable + others.


THE AUDIO SHOP, Coffee Tavern Court, High St, Rushden. (0933) 56651. Audio Technica, Denons, Goodmans, Rotel, Tannoy, Ion Systems, Thorens, Gale, BLQ, Royd. Dem room. Home trial and free installation. Mon-Sat 9.30-5.30 (Thurs 9.30-2). Service dept.


NOTTINGHAMSHIRE

DEFINITIVE AUDIO, Nottingham. (0602) 813562. Voyd, Valdi, Systemdek, Helius, Audionote, Golding, JPW, Snell, Target, Pirate. Home demonstrations throughout Nottingham and East Midlands. Please telephone (0602) 813562 for further information.

WEST MIDLANDS

ALTERNATIVE AUDIO Ltd, 93-95 Hobs Moat Rd, Solihull. (021) 742 0254 (sales), 0248 (service). A&R, Audiolab, Denon, KEF, Marantz, Meridian, Mission, M.A., The Source, Philips. Tues-Sat 10-6, closed Mon. Home trial facilities, 3 dem rooms, free installation, instant credit. Access, Visa, Amex. Service dept. BADA MEMBER 

GRIFFIN AUDIO Ltd, 94 Bristol St, Birmingham. (021) 692 1359. Linn, Naim Audio, Rega, Creek, Denon, Nakamichi, Quad, Mission, Monitor Audio, Rotel. BADA MEMBER 

FRANK HARVEY HI-FI EXCELLENCE, 163 Medieval Spon St, Coventry. (0203) 525200. Linn, Musical Fidelity, Quad, Mission, Cyrus, Denon, A&R Cambridge, Rotel, Nad, Nakamichi etc. Three floors of carefully selected hi-fi amidst the eloquence of our 14th century showroom. Dem, home trial and credit facilities. Access, Visa, Diners, Am. Exp. Mon-Sat 9.30-5.30. Closed Thurs. BADA MEMBER 

HORTON ELECTRONICS (1987) LTD, 8-9 Lower Temple St, Birmingham B2 4JD. (021) 643 0972. Aiwa, Dual, Marantz, Goodmans, JVC, Mission, Sony, Technics, Wharfedale, Sennheisser. Dem facilities. Credit to £1000. Access, Visa. 9-5.30 Mon-Sat. Service dept.


RICHER SOUNDS 2, 12 Smallbrook Queensway, Birmingham B5 4EN. (021) 643 6664. Popular esoteric hi-fi for upgrades, monthly special offers. Dem facilities, expert advice, free local delivery/installation (£500+), 2 Yr G'tee. Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6; Sat 10-5. Access, Visa, Richer ChargeCard. Service Dept.

RICHER SOUNDS, 10 Smallbrook Queensway, Birmingham B5 4EN. (021) 643 1516. An A-Z of affordable, popular hi-fi; no-frills environment. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard. Service Dept.


FIVEWAYS HI-FIDELITY LTD, 12 Islington Row, Edgbaston, Birmingham. (021) 4550667. Alphason, A&R, Denon, Meridian, Musical Fidelity, Nakamichi, Quad, Revox, TDL, Thorens, etc. Dem and home trial facilities. Tues-Sat 9.30-6. Free installation. Access, Visa. Service Dept.

BRIDGE HI-FI, 3 Tudor House, Bridge St, Walsall. (0922) 640456. NAD, Dual, Yamaha, Kenwood, Technics, Pioneer, Mission, Celestion, Denon, Mordaunt Short. Apts required. Home trial and free installations. Access, Visa, Diners, Amex. Credit to £1,000. 9.15-5.30 Mon-Sat. Service dept.

OXFORDSHIRE


ABSOLUTE SOUND AND VIDEO, 19 Old High St, Headington, Oxford. (0865) 65961. A&R, Denon, Linn, Mission, NAD, Rotel, Yamaha. Also 256, Banbury Rd, Summertown. BADA MEMBER 

ASTLEY AUDIO LTD, 3 Marketplace, Wallingford. (0491) 39305/34349. AR, Dual, Kenwood, Mordaunt-Short, Mission, Monitor Audio, Philips, Technics, Tannoy, Yamaha. Tues-Fri 9-5.30, Sat 9-5. Records, tapes, 1000+ CD's. Service Dept. Access, Visa, Diners.

WESTWOOD AND MASON, 46 George St, Oxford. (0865) 247783. Linn, Naim, Rega, A&R, Heybrook, Dual, Mordaunt-Short. Mission, Tannoy, Quad, etc. BADA MEMBER 

WITNEY AUDIO & VIDEO, 28 High St, Witney, Oxford. (0993) 2414. A&R, Aiwa, Akai, Bose, Denon, Dual, Goldstar, JBL, Mordaunt-Short, NAD, Pioneer, Sony, Yamaha. Dem facilities. Mon-Sat 9-5.30. Free installation, credit to £1,000. Access, Visa. Service dept.

OXFORD AUDIO CONSULTANTS LTD, Cantay Hse, Park End Place, Oxford OX1 1JE. (0865) 790879. Oxford Acoustics, Audio Research, Krell, Magneplanar, Apogee, Aragon, Stax, Marantz, Wharfedale, Cambridge Audio. Home trial and free installation. Instant Credit. Access, Amex, Visa. 10-6 Tues-Sat. Service dept.

HORNS OF OXFORD LTD, 6 South Parade, Summertown, Oxford. (0865) 511241. Alphason, Ariston, B&W, Celestion, Marantz, Nakamichi, Pink Triangle, Quad, Sony, Technics. Free installation. Service dept. Access, Visa. 9-5.30. Closed Thurs. BADA MEMBER 

SHROPSHIRE

AVON HI-FI Ltd, 12 Barker St, Shrewsbury. (0743) 55166. A&R, B&W, JBL, Dual, NAD, Nakamichi, Revolver, Trio, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9-5.30, closed Thur. Free installation, credit to £1,000. Access, Visa. Service dept.

MID SHROPSHIRE AUDIO, 24 Peverill Bank, Dawley, Telford. (0952) 502828. Agencies include Alphason, Apollo, Ariston, Audio Innovations, Goldring, Ion Systems (full range), Marantz, Michell, Ortofon, QED, Royd, Ruark, Sansui, Sennheisser, SD Acoustics, SME, Target. Guaranteed used equipment also available. Free delivery nationwide. Mail Order. Access/Visa. Credit facilities. Part exchange.

CREATIVE AUDIO, 9 Dogpole, Shrewsbury. (0743) 241924. Marantz, Meridian, Linn, Naim, A&R, Mission, Nakamichi, Revolver, Castle, Audio Technica. Dem room. Home trial and free installation. Credit to £1000. Access, Visa. Tues-Sat 9.30-5.30. Service dept.

SOMERSET

WATTS RADIO - THE ENGINEERS, Jim Badman, 1 West Street, Somerton. (0458) 72440. Castle, Dual, Denon, KEF, Mordaunt-Short, Ortofon, Quad, Rogers, Thorens, Yamaha. Dem and home trial facilities. Mon-Sat 9-1, 2-5.30, Wed 9-1. Free installation. Credit to £1,000. Access, Visa. Service dept.

STAFFORDSHIRE

GRANGE HI-FI LTD, 153 Branston Road, Burton-on-Trent. (0283) 33655. Pink Triangle, Voyd Valdi, Marantz, Audio File, PH, Systemdek, Audio Innovations, A&R Cambridge, Quad, Rotel, Snell, Manticore, etc. 2 dem rooms. Mon, Tues, Thurs, Fri, Sat. 9-6. Closed Wed. Free installation. Credit facilities. Visa, Access. Service dept.

SELECTED DEALER DIRECTORY

ACTIVE AUDIO, 29 Market Street, Tamworth, Staffordshire. (0827) 53355. Arcam, Ariston, Celestion, Denon, Heybrook, Kef, Cyrus, Musical Fidelity, Marantz, Revox, Rotel, Rogers, etc. etc. Demonstration and home trial facilities. Account and credit cards. Ring for opening times and free 'Pact Pack'. BADA MEMBER. **3-1-82**

SUFFOLK

EASTERN AUDIO, 41 Bramford Rd, Ipswich. (0473) 217217. Quad, Audio Lab, Denon, Dual, Marantz, Mission, NAD, Nakamichi, Technics, Arcam. Mon-Sat 9.30-6. BADA MEMBER. **3-1-82**

SURREY

AERCO AUDIO Ltd, 11 The Broadway, Woking, Surrey GU21 5AP. (04862) 4667. Roksan, Exposure, Ion, Royd, Systemdek, Thorens, Acoustic Research, Nakamichi, Monitor Audio and many more. 2 dem rooms. Appt's advisable. Home trial and free installation, part exchange. Access, Visa, Amex, Diners. Credit Facilities. Mon-Fri 9.30-6.00. Sat 9.00-5.30. Service dept. BADA MEMBER. **3-1-82**

ROGERS HI-FI, 13 Bridge Street, Guildford (0483) 61049. Ariston, Acoustic Research, Akai, Denon, JPW, Mordaunt-Short, Marantz, Onkyo, QED, Tannoy etc. Mon-Sat 9.30-6. Dem. facilities. Instant Credit. Access, Visa. Service dept.

SURBITON PARK RADIO, 48 Surbiton Rd, Kingston-Upon-Thames, Surrey. (01) 546 5549. Quad, Dual, Denon, Kenwood, Nakamichi, Rotel, Pioneer, QED, B&W, Tannoy, Mordaunt Short, Castle, KBL. Dem and home trial facilities. Access, Visa. 9.30-5.00 Tues-Sat. Service dept. **TRU-FI SOUND AND VISION**, 2 Central Parade, Redhill, Surrey. (0737) 767400/766128. Akai, Aiwa, B&W, Nakamichi, JPW, Mission, Mordaunt-Short, Nagaoka, Sony, Technics. Dem. facilities. Mon-Sat 9.30-6. Free installation, credit to £1,200. Access, Visa. Service dept.

UNILET PRODUCTS Ltd, 35 High St, New Malden, Surrey KT3 4BY. (01) 942 9567. Mon-Sat 9-6. Thurs 9-7. Dem facilities. Large stock. Amex, Access, Diners, Visa.

SPALDINGS HI-FI, 352-4 Lower Addiscombe Rd, Croydon, Surrey. (01) 654 1231. A&R Cambridge, Audiolab, Denon, Linn, Marantz, Mission, Musical Fidelity, Meridian, Naim, Quad. 3 dem rooms and home dem. Free installation, credit facilities. Twice nominated Sony E.S. Hi-Fi Dealer of the Year. Mon-Sat 9-6, Tues to 8. Closed Wed. Service dept. BADA MEMBER. **3-1-82**

TRU-FI SOUND & VISION, 10 Church St, Leatherhead, Surrey. (0372) 378780. Sony, Technics, Panasonic, Mitsubishi, Ferguson, Aiwa, Pioneer, Sanyo, B&W, Mission, Wharfedale. Free installation. Credit facilities. Access, Visa. 9.15-5.30 Mon-Sat. Closed Wed. Service dept.

SUSSEX (EAST)

DEFINITIVE AUDIO BRIGHTON, 30 Islingword Street, Brighton, East Sussex BN2 2UR. (0273) 672796. Voyd, Systemdek, Helius, Audio Note, JPW, Snell, Pirate Stands, Goldring, etc. Wed-Sat 11-7. Home dems throughout Sussex. Credit facilities. Visa.

JEFFRIES HI-FI, 69 London Rd, Brighton, East Sussex. (0273) 609 431. 2 dem rooms, closed Mon, late night Wed. Parking, bus route. Credit facilities

BADA MEMBER. **3-1-82**
JEFFRIES HI-FI, 4 Albert Parade, Green St, Eastbourne, East Sussex. (0323) 31336. 2 dem rooms, closed Mon. Late night Wed. Parking, bus route. Credit facilities.

BADA MEMBER. **3-1-82**
HASTINGS HI-FI, 31-32 Western Rd, St Leonards On Sea. (0424) 442975. A&R, B&W, Mission/Cyrus, NAD, Nakamichi, Quad, Rotel, Systemdek, Tannoy, Yamaha. 2 dem rooms. Mon-Sat 9-6. Home trial facilities. Free installation. Credit facilities. Access, Amex, Visa. Service dept.

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THE DIRECTORY

The *Hi-Fi Choice Directory* was conceived as a reference guide to all the audio products reviewed by *Choice* that are currently available. The products are split into suitable categories, each with its own introduction containing information about the product type and its applications. They are particularly relevant to the uninitiated first time buyer and help sort out the order of priorities when buying a piece of equipment.

Each product along with its retail price is listed in its respective category in alphabetical order. For instance the Acoustic Research *EB101* is presently at the beginning of the Turntables and Tonearms section; however, the Ariston *RDS0 Superior* heads the Motor Units section as it is sold and was reviewed as a separate component – requiring a separate arm. Where there are several products with the same name but different model numbers these are in price ascending order.

Then come the ratings for the standard achieved in laboratory and listening tests, with the exception of certain product groups where lab tests were not carried out. One important point to remember is that they cannot be used to compare products from different categories – ie a cassette deck rated 'excellent' in sound quality will not usually offer the same standard of fidelity as a similarly rated

turntable or CD player (unless you can get hold of first generation copies of the master tape!).

The Comments column contains a potted summary based on the original review, emphasising the salient points of a product's character and sonic performance. The space available doesn't allow for great detail but in the 20 or so words we have attempted to put across the essence of the review, in some cases using quotes from the review itself. Obviously, important information on compatibility or auxiliary equipment used in the test cannot be included, and it is best to refer to the original review for this, of which more later.

The next column(s) varies from category to category but is usually either features or specifications, the former being facilities available on a cassette deck or amplifier or the type of drive system on a turntable.

Specifications vary with product type but usually relate to suitability or capability, for instance arm matching figures are given with the cartridges which tie in with the mass figures for the tonearms themselves, making it easier to avoid compliance/mass mismatches.

Perhaps the most influential letters in the Directory are those found in the Value column, the *Rs* and *Bs* denoting the Recommended and Best Buy ratings that are appended to products we consider meritorious. The Best Buy tag means that a product not only offers good sound quality but is reasonably priced as well. With source components a price limit of approximately £300 is usually used as a

guide. Recommended means that either the performance of a product is particularly good irrespective of price or, alternatively that a good value standard is achieved but overall attainment falls short of Best Buy classification. An ideal situation would be to choose suitably priced Best Buy or Recommended products from relevant categories and create a Best Buy system, but, due to the variety in tonal balance that exists in much audio equipment (especially the electromechanical elements – ie cartridge and speaker) system building is not quite that simple. These ratings make a useful guideline for shortlisting components, but only experiencing the actual combination will tell you whether it works for you.

The final column contains a reference to the issue of *Hi-Fi Choice* which featured the complete review. If you wish to get a better idea of a product by reading the complete review it is possible to order a copy (if still in print) through our back issues department. Every *Choice* issue contains a Back Issues page for this purpose.

The Directory is constantly updated with the latest reviews and price changes as well as having discontinued products removed. If a listed product is updated to a 'mark two' form and the alterations are purely cosmetic or not too extensive we sometimes leave the product in with its current model number and an asterisk to denote that it has changed since our original review was published.

SYSTEM BUILDING

Pre-packaged one-make systems have been commercially very successful, with advantages like cosmetic consistency, competitive pricing, and (assumed) technical compatibility. However, despite the mass market clout of the consumer electronics giants, the hi-fi tradition of specialised separate components seems as strong as ever, and certainly represents the route taken by those who place sound quality ahead of other criteria.

Yet those who choose the separates route still have lingering doubts – usually completely unjustified – over the compatibility of components from different manufacturers. Gross incompatibilities are very rare nowadays, only likely to rear their heads amongst the most exotic components. Here the delicate art of 'supercompatibility' really takes over the major role and might be regarded as the key to 'real' hi-fi.

There are now three different pre-recorded music media competing for the attention of the hi-fi user, and to go for all three will either cost a lot of money or involve substantial compromises in the sound quality of each. For this reason many separates purchasers may start with just one source, adding others or a tuner when funds permit.

There will always be controversy over the relative qualities of LP, CD and cassette. LP is still the choice for ultimate sound quality – particularly for those prepared to spend a substantial sum on a good quality turntable system. Furthermore the vinyl repertoire is still the cheapest, largest and most varied.

Cassette has never really challenged vinyl's superior quality, but it is a multiple role format, offering 'go anywhere' flexibility, a uniquely useful recording capability, plus a broad catalogue of pre-recorded music cassette material. As a hi-fi medium cassette suffers from pre-recorded material which has been improving but is still patchy in quality, and can usually be bettered by a home recording. There is also the worry that a tape made on a specific machine usually replays best on that machine, which may cause aggravation when upgrading a few years hence. It is worth remembering that though such opportunities are rarely possible or practical, a live recording onto cassette using good quality microphones can be the hi-fi equal of any other source.

CD is the latest challenger to these two established media, using a digital instead of analogue storage format. The sound quality remains controversial, hailed as near perfect by its fans but derided by vinyl freaks, so it is probably fairest to say that CD is fine for most listeners, but may not suit everyone; certainly the lack of background noise, defects and deterioration over time are major strengths.

While there will always be arguments about the different music storage and transmission formats available to the hi-fi listener, there is also controversy over the relative importance of the different components which make up the system chain – by which is meant the source, the amplification, and the loudspeakers (and for the pedantic the room itself, though there's often little that can be done here).

For many years the 'weakest link' theory proposed that the loudspeakers needed the most attention, that amplifiers merely had to have sufficient power, and that turntables were pretty well perfect. However, this perspective has become steadily discredited by an alternative 'theory of precedence', which stresses that no subsequent component can make up for the inadequacies of its predecessors – all it can do is supply its own additional degradations. In such a context it is not uncommon to find more than half the system budget allocated to the record player, with scrimping and saving made on amplifiers and loudspeakers, even though these are used all the time whatever the source.

Choosing the components of a system is only part of the task of getting the system as a whole working as well as possible. Good turntables and loudspeakers both benefit to a surprising degree from proper support – from stands that enable them to give their best performance, whether floor-standing or wall mounted.

Siting of components within a room can play a significant role, as can the room itself. Some people may prefer an acoustically more 'live' room than others, but most will agree that the larger it is the better, because this tends to provide smoother and better extended bass reproduction. All rooms create reflections and standing waves, and the effects of these are more severe if all opposing walls are parallel, similar distances apart, and with hard reflective surfaces. Provided that the loudspeakers can be placed fairly symmetrically, slight asymmetry elsewhere in the room is usually helpful.

The loudspeakers are most critical of placement, because it is their job to create the stereo image, and it will be impossible to do this if the sound from each is not roughly similar at the listening position. Each loudspeaker should operate in a similar immediate acoustic environment, unencumbered by other furnishings and structure, and a similar distance from listener, nearby walls, and corners. Some loudspeakers are designed to operate close to a rear wall, others a metre or so out into the room, but all loudspeakers benefit from being closely mechanically coupled via proper stands to the floor.

There is some debate about the best form of fixing, however, adjustable spikes through to the

floor proper or seated into the tops of cross-head screws are generally regarded as the best solution in most circumstances. There is no need for paranoia about using spikes through normal pile carpets because the holes will be almost impossible to find when the stands are removed.

Most decent quality turntables are fairly immune to feedback from loudspeakers, so it should not matter too much if these items are sited fairly close to each other. Indeed it is debatable whether any advantages gained from keeping the turntable well away are not lost through the need to use longer connecting cables.

Mixing and matching the components of a record player to get optimum results can be something of a black art, over and beyond the fairly simple business of choosing a cartridge of roughly the right compliance to suit the arm effective mass. Certainly the combining of turntables and tonearms is not a simple matter, and this is where a good specialist dealer will come into his own, both in terms of recommending good combinations from the models he holds in stock, and then in correctly carrying out the sometimes tricky set up procedures which are often required to get the best results.

The key to getting the best results from a separates system lies in finding an experienced and skilled dealer in the first place, one who takes the trouble to find out what you really want and then demonstrate some likely alternatives, without trying to cram his own particular prejudices down your throat. To some extent the customer's task must be to discover for himself whether the dealer in question is competent or not. Membership of trade organisations like BADA can be a worthwhile pointer to a degree of professionalism, but the bottom line is whether the dealer in question can create a good sound in his own shop. If he can't, there is precious little chance of him doing so in your home. The best dealers should lay on demonstrations so you can hear the differences between components for yourself, and hear the sort of improvements which can be had at different price strata. You can then establish the sort of performance you are prepared to accept within whatever budgetary constraints you have set.

The Directory has been compiled so that it can be used by *Choice* readers as a buying guide. A guide in the sense that you should use the information in it to make a shortlist of equipment suited to your needs and budget, and then addition it to a dealer's before taking the plunge. Because tastes inevitably differ it would be unwise to buy purely on the basis of our recommendation and dealers are the most experienced people around when it comes to making systems work as a whole.

THE DIRECTORY

TURNTABLES & TONEARMS

The schizophrenic split between consumer electronics and 'real hi-fi' is most obvious amongst turntables. The former are supplied simply as a means of playing vinyl in a system context. Cheaply manufactured in the Far East, these are complete players with a variety of automatic facilities, sometimes tied into system remote control. But engineering compromises severely limit sound quality, cartridge choice may be P-mount restricted, and such machines are rarely stocked by specialist hi-fi dealers these days.

Specialist turntables offer big sound quality

improvements, but lack so-called convenience features (that practised users often find irksome). Such turntables at the cheaper end of the market (sub-£350) tend to be supplied with matching tonearm, and often include a 'starter' cartridge. Still better quality is found at higher prices amongst the separate motor units and tonearms. Careful partnering and set-up is essential for these individual components, but 'naturally sympathetic' combinations do exist, and the good dealer can help.

Listed separately as integrated players and as turntable motor units and tonearms, our **sound**

quality rating is based on results achieved using a high quality system – but in point of fact the turntable is usually the limiting factor soundwise in any system. **Lab performance** summarises the speed stability, vibration generation and environmental isolation of turntables, along with the friction, alignment and adjustment of tonearms. The tonearm's physical characteristics also define a range of mechanically compatible cartridges (see cartridge listings).

INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research EB101 £230	Good Good	This genuine high fidelity product offers an impressive package at a competitive price	Subchassis, manual, 13.5g	BB	48
Alphason Soto/Xenon MCS £365/£262	Average+ Good	The deck is warm and euphonious with high levels of clarity. Wow artefacts occasionally just audible.	3 point suspended motor unit, optional quartz PSU/speed change 13g		67
Alphason Sonata/HR-100S-MCS £720/£480	Excellent Very Good	Highly capable audiophile system with real resolution and control. Bass is powerful and dynamic ability unbridled	Manual, subchassis, belt drive, 10g	R	60
Ariston Q-Deck £150	Good Average+	Well engineered and good sounding low cost package which is both easy to set up and to use	Semi-auto, belt drive, solid	BB	67
Ariston RD60 £219	Good Good	With the Enigma arm, this balanced and communicative turntable falls only slightly short of the RD90 on sound quality	Manual, belt drive, subchassis, 11.5g	BB	48
Ariston Forte £350	Below Average Average	Heavy on engineering, short of soul? The Forte almost makes it, losing out only because of some residual pitch variations and a lack of bass power. The arm is modestly good	Manual 2-speed belt drive player and detachable arm, 10g		67
Dual CS430 £89	Average Below Average	Ragged, sometimes unpleasant cartridge mixes with a modest pleasing player in a very sharply priced package.	Belt drive, with cartridge, auto return, 5g	R	67
Dual CS503-1 £114	Poor Average	Slated as a replacement for the CS505, the 503-1 needs careful system matching to mask rumble and microphony, but is good enough to benefit from a better cartridge	Semi auto, belt drive, low mass arm	R	55
Dual CS505-3 £139	Very Good Good	Continuous steady improvements have kept this model at the forefront of the budget market. Practicality is excellent and the deck has excellent timing bass/mid and stereo imaging	Semi-auto belt-drive, 8g	BB	67
Dual CS5000 £200	Average Average+	The rare 78 facility may give grandma's collection a new lease of life but the player did not merit recommendation on price vs sound	Electronic, belt drive, subchassis, 10g		48
Goldmund ST4 £4,550	Very Good Excellent	The Studio turntable takes on a cheaper tonearm than the T3F, yet provides a similar reference standard objective and subjective performance at £2,000 less, in a neatly integrated though bulky package.	Solid subchassis, direct drive, parallel arm, detachable headshell	R	60
Heybrook TT2 turntable & arm £349/£249	Average Good+	A gradual process of informed evolution and a sensibly designed arm combine to make this a good sounding middle of the road package. Well supported by dealers	Manual subchassis motor with arm, belt drive, 14g	R	67
JVC AL-FQ555 £170	Below Average Poor	Clear midband sound but woolly bass and crude treble. Ease of use however ranks highly, and there's little to go out of adjustment	Auto, direct drive, 5.5g		67
Kenwood DP-990 £300	Average Average	Smart, slick and massive player suitable for low compliance cartridges only. A good but not inspired performer.	Semi-auto 2 speed direct drive, 16g		67
Kuzma Stabi/Stogi £575/£349	Average+ Stabi: Good; Stogi: Excellent	Stabi is powerful, spacious but not sufficiently subtle. Stogi is an excellent all rounder with even spread of abilities.	Manual, belt drive, subchassis, 12.5g	Stogi: R	60
Linn Axis £379	Good+ Good+	Setting new performance-for-price standards this cleverly engineered and competent deck has many of the qualities of the Sondek LP12	Electronic, belt drive, semi subchassis, 13g	BB	48/Coil
Linn Sondek/Ittok (Troika) £509/£429 (£669)	Excellent Excellent	Superb sound – the best LP12 combination yet. The Troika gives the system real solidity and strength, stretching the deck and arm qualities to the full	Manual subchassis player, belt drive, 14g	R	60
Manitcore Mantra £325/£403 (Arm)	Good+ Good+	Fitted with a Rega RB250 arm variant and AT95E cartridge the Mantra fared very well indeed with a fine midrange and good focus	Subchassis, 12g, manual	BB	48/Coil
NAD5120 £89	Average Average	A number of running improvements have given this player a range and tautness denied its lazier sounding antecedents.	Semi-auto belt drive, detachable arm/tube/weight, 9g	BB	67
Omega Point Silver/Black £895/£295	Good Good+	An awedly stripped down turntable that lacks even an on/off switch, the Omega Point Silver offers fine midrange clarity and good stereo, but some HF compression and a lack of 'wellie'	Manual, solid, belt drive, unipivot, 11g		55
Opus 3/Decca London International (Revised) £399/£99	Poor Good	Heavyweight motor unit with many fine properties, but which needs further development. The idiosyncratic arm is a suitable (though not ideal) platform for the Decca cartridge. For all its faults though, the whole transcends the sum of the parts	Belt-drive manual, damped unipivot arm, 12g		67
Rega Planar 2 £155	Average+ Good	A remarkable product at the price, surprisingly articulate and confident	Integrated turntable, manual, 11.5g	BB	48
Rega Planar 3 £207	Good Good	A long time leader in its price category, the '3' (with its excellent RB300 arm) sounded nicely 'musical' in a balanced and coherent manner	Integrated turntable, manual, 11.5g	BB	48
Revolver Rebel £160	Below Average Below Average	Fat, assured and forward presentation, but ragged and subjective speed stability problems. With a little further development, it will be a winner	Manual, 2-speed belt drive inc cartridge, 13g		67
Revox B291 £660	Average- Average-	Sound quality ranks as below average. Subjective bandwidth is narrow and the music lacks grace and energy. Ease of use however is unrivalled	Automatic, remote controllable, direct drive parallel arm, prefitted cartridge		55
Roksan Xerxes/Artemiz/Shiraz £655, £450, £489	n/a Very Good	Imaginatively designed, sophisticated front-end system, a little drier than some perhaps, with superior stereo, resolution and presence	2-speed manual, MC cartridge, 9g	R	72
Sansui SR-222 Mk V £159	Average- Average	More than acceptable in most areas, the Sansui is detailed and positive, though a little muddled when stressed. Best suited to low compliance cartridges	Manual 2-speed belt drive, 16g		67
Systemdek IIX £248	Good Average+	Poised, clean sounding deck, forward and explicit in character. A good value deck under £250, and a relatively cheap and satisfactory suspended model	2 speed belt drive manual turntable and arm, 11g	R	67
Technics SLBD-22 £90	Average- Average-	Not bad for the price and a great improvement on the L20, it performs reasonably when not stretched	Semi automatic, solid plinth, electronic, 6g P-mount	R	48
Technics SL-DD33 £110	Average Average	As with the QD33 though better value	Automatic, direct drive, solid plinth, 7.5g, P-mount	BB	48

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INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Technics SL-L20 £115	Poor Average-	A rather lightweight parallel tracker achieving a poor overall rating, with little to recommend it unless you dig facilities	Electronic, solid plinth, 5g, P-mount		48
Technics SL-QD33 £140	Average Average	The quartz speed controlled version of the DD is short on sound quality but not features. But it did have fair focus and some depth	Automatic, Quartz, direct drive, solid plinth, 7.5g, P-mount	R	48
Thorens TD280 £150	Average Average	Extremely competitively priced package with a trace of lower-mid overhang, but it's very well behaved elsewhere	Semi-auto belt-drive 2-speed, 13g	BB	67
Thorens TD166 Mk II £179	Average Average+	A polished and professional design consisting of a first rate budget suspended subchassis turntable and a mildly disappointing arm	Manual 2-speed, 13g	BB	67
Thorens 160S Mk IV £249	Average+ Average+	Fine, familiar suspended player and arm. Faults are few, but include poor arm bearing adjustment. The arm can sound a little messy	Manual 2-speed, 7g	R	67
Thorens TD320 Mk II £349	Good Good	Good, consistent sounding deck with much improved (but not ideal) arm. A little expensive for performance offered	Semi-auto two speed belt drive, 14g		67
Well Tempered Turntable & Arm £1690	Average Very Good	Intriguing and challenging design. Musically it is not ideal, but it has a limpid quality and a lack of artificiality that sets standards as well as turning the ear, though it's not completely uncoloured. A charmer yet mainstream enough in its virtues to be viable	Manual 2-speed, damped, suspended arm, 7.5g	R	67
Zarathustra S4/Pluto 5A Prestige/PSU £1500/£2500/£500	n/a Excellent	The very well made and finished heavy platter S4 with the superb Pluto arm make a devastating combination ranking up there with the very best	Subchassis, manual, available without PSU	R	72

MOTOR UNITS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ariston RD90 Superior £900	Good+ Good	Good but slightly damped sound quality, with powerful and stable bass. The pro quo is a certain lack of pace, energy and resolution	Belt drive, subchassis, electronic		55
Michell Syncro £265	Good Good	A particularly happy blend of qualities endows the Syncro with a blend of subtlety and force - the maled fist in the velvet glove. Easy on the ear in the best sense	Manual, belt drive, suspended motor unit	R	67
Michell Gyrodec £595	Good Good	Sweet and natural sounding player, well exploited by the Rega RB300 arm. Aesthetics, and the acres of acrylic, are unique	Manual, belt drive, suspended motor unit		55
NVA Turntable £499	Average Good	A surprisingly fast and assured performer, but with lightweight bass and a little aggressive. Easy to set up, the price (necessarily) includes stand	Manual, belt drive subchassis, stand, 33 1/3rpm		60
Oracle Alexandria Mk III £825 - £995	Very Good Very Good	One of the most beautifully presented players made, and fully supported by superb separation, dynamics and a euphonious style of delivery	Manual 2-speed belt drive	R	67
Oracle Delphi III £1450	Very Good Very Good	Stable imaging, good bass and refined detail, it's well made and consistent in service - but very expensive	Manual, belt drive, subchassis	R	60
Oxford Acoustics Crystal Reference £1995	Very Good Excellent	This big, open and powerful sounding turntable works beautifully with Airtangent arm to give superb 3-D imagery	Manual, belt drive, subchassis, stand	R	60
Pink Triangle PTT00 £650	Good Excellent	A state of the art player, easy to set up but extremely fussy about partnering equipment and state of tune. The test sample suffered flutter derived roughness (presumed not typical)	Manual 2-speed, outboard PSU	R	67
Rega Split Slab Modification Kit £74	Good Good	Clever and cheap upgrade kit that protects the initial investment and which adds clarity and environmental isolation to a fine but microphonic original	Conversion suspended chassis kit for Rega 2/3		67
Roksan Xerxes £655	Excellent Excellent	This unique design cuts a swathe through the conventions of turntable design, providing superb resolution and stereo. Setting up is best left to an authorised dealer	Manual, belt drive, solid/decoupled	R	67
SEE Revolver £135	Average Average	Nicely balanced, but unimpressive timing and lightweight bass made this deck rather average for the price. Manufacturer has since made several changes, but not re-submitted for review	Manual, belt drive, solid plinth		48
Systemdek IIXE £248	Good Good	Fine, honestly specified and well built player which easily betters its closest stablemate, the IIX	Manual 2-speed, external PSU	R	67
Systemdek IV £495	Good Very Good	The level of wow is a theoretical concern at least, but elsewhere this player shines, combining euphony, information and imaging in a polished, untemperamental package	Two-speed manual belt drive	R	67
Thorens TD521 £629	Average Average+	Nice product. Unexciting, rather undynamic and insubstantial sound quality, but facilities such as ability to accommodate 12 inch arm compensate	Manual, belt, suspended motor unit, 78rpm, pitch control		55
Townshend Avalon £299	Good Good	Some smear and coloration, probably due to structural shortcomings of the plinth, take the edge off this otherwise well turned out and well priced machine. Worth trying if you can't afford the full-blown Rock	Manual 2-speed belt drive	R	67
Townshend Rock £450	Good Good++	Tight, tidy sounding player which works with a wide variety of (non-tangential) arms, giving almost CD like precision and clarity. Good bass depth, dry balance - our Editor's favourite deck, in fact	Manual, belt drive, solid, arm damping, various optional extras	R	55

TONEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Alphason Opal £110	Good Average	This is a straightforward adequate sounding low cost arm, priced just above where it rightly belongs	10g		55
Alphason Delta £165	Good Average+	A highly competent design from Alphason gives good sound quality but with slight blurring and treble fizz	16g	R	48
Alphason Xenon £210	Good Good+	A trimmed down HR100S, the Xenon has inferior bearings and a simpler finish, but sounds crisp and coherent. Fits any Linn cutout	12.75g	R	55
Alphason HR100S £395	Good++ Very Good	This S-shaped arm sounds smooth, but nevertheless reproduces transients with fine attack	10g	R	48/Coll
Ariston Enigma £99	Average Average+	Good but not the best in its class: mid-band sounds a little uneven; treble a trifle "brash"	11.5g		48
Audio Technica AT1130 £186	Good Good	Well suited to most cartridges including high compliance ones, the AT is smooth and tonally neutral, if slightly lacking in 'balls'	8.5g	R	67
Decca International £49	Average+ Average+	This uni-pivot design gives a rather rich tonal balance and some bass muddling. Could be good with Decca cartridges, but not well built	12g		48Summary
Eminent Technology £1000	Good+ Good++	One of the best sounding tonearms around, the linear tracking Eminent delivers impressive stereo imagery, focus and transparent sound	9g (vertical)	R	48/Coll
Goldmund T3F arm £3950	Excellent Excellent	This complex parallel tracker created an "ear-opening" experience when tested with a (since updated) Goldmund Studio turntable	16.5g	R	Coll 2
Grace G707 £299	Good Good+	This venerable is still capable, if not competitive with modern alternatives	7g		48

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TO NEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Helius Orion 2 £490	Very Good Very Good	Very expensive but with a performance that merits recommendation	12g	R	48
Linn LV Plus £129	Good + Good	The fixed headshell provides an improvement over the LVX resulting in better clarity, detail and punch	13g	BB	48
Linn Ittok LVII £429	Very Good Very Good	Suitable for many turntables this top-quality arm performs best with the LP12, the combination exceeding the sum of both parts	13.5g	R	48/Coil
Linn Ekos £895	Very Good Very Good	Superb, state of the art design which builds significantly on Ittok's strengths	9g	R	67
Mission Mechanic £900	Good Good +	Nearly right, but inconsistency with level and vague imagery spoil what is otherwise a firm, powerful advocate for black vinyl	11g		55
Moth Arm £78	Good Good +	The ultimate budget arm? Refined, detailed, sweet and natural – performance improves in line with the rest of the system	12g	BB	60
Rega RB300 £115	Good + + Good + +	Despite its modest price this sets exceptional performance standards and could be used on a number of high-quality turntables	10-11g	BB	60
Roksan Artemiz £450	Average Good	Excellent but flawed arm which needs some development and refinement before it can be wholeheartedly endorsed. Watch this space. Fits Rega cutout	8g		67
SME 3009 Series IIS £165	Good Average +	A simplified less flexible (as regards adjustment) Series III with a similarly 'soft' sonic character	5g		48
SME 3009 Series III £229	Good Average +	Comprehensively adjustable and very well made, suited to MM and high compliance MC cartridges	5g		48
SME 3009R £291	Average + Average +	A higher mass version of the Series III designed for low compliance MC cartridges	12g		48
SME Series IV £810	Excellent Very Good	Superb engineering and finish with a finely balanced sound giving impressive stereo focus and low coloration	10.5g	R	60
SME Series V £1206	Excellent Very Good	Excellent in terms of design engineering and sound quality, this arm arguably sets a new reference standard regardless of price	10.5g	R	60
Souther Tri-Quartz £895	Average Good	A unique parallel tracking arm that makes up for what it lacks sonically in its unusual appearance	3-4g		48

CARTRIDGES

Very much the 'slave' of turntable and tonearm and to some extent undermined by the supply of free 'starter' cartridges on many turntable systems, the cartridge is still worth taking seriously. The quality of both the stylus itself and the cartridge's tracking performance are important in preserving that most important part of the hi-fi system – the record collection – and the cartridge also plays a significant role in determining the overall balance of a system.

Cartridges fall into two groups: high output models, capable of working directly into any amplifier, and more expensive low output models. Stereotypically, low output cartridges use the moving coil principle of operation, have better mechanical integrity and tighter tolerances, and give better performance but at much higher cost. Most under-£150 amplifiers and many valve designs need either an extra head amp or transformer to cope with the low output. **Cartridge/amplifier**

interfacing can be very subtle, but even basic high output moving magnet designs benefit in overall balance from optimised amplifier capacitance loading. Still more important, the mechanical cartridge characteristic of cantilever compliance ('springiness') needs to be considered in the light of the effective mass of the tonearm which will be used (see Turntable & Tonearm entries).

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
A&R C77 £20	Average + Average +	A sensible moving magnet package with good bounce at a competitive price	6-16g Normal, MM	BB	48
A&R C77Mg £30	Average – Average	Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8g Normal, MM	BB	67
A&R E77Mg £47.50	Average Average	Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8g Normal, MM	R	48
A&R P77Mg £60	Average + Average +	Cautiously recommended, the P77Mg was preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9g Normal, MM	R	48
Audionote ID2VDH £795	Good Very Good	One of the best, giving 'an extraordinarily relaxing midrange clarity'. But it picked up a bit of surface noise and dust and needs a transformer	8-18g Very low (transformer), MC		43
Audioquest MCS £200	Average Average	Offers high-output benefits but the drooping frequency response and severe VTA error preclude recommendation	10-20g Normal, MC		54
Audio Technica AT95E £17	Average – Average	Clear, dynamic if richly balanced, the magnetic '95E is a definite Best Buy	8-14g Normal, MM	BB	48
Audio Technica AT-420E OCC £30	Average Average	Better suited to pop recordings this MM bears some of the sonic hallmarks of the Linn K5	7-14g (damp) Normal, MM	R	67
Audio Technica AT-430E OCC £42	Average + Average	A rising high frequency response yields something of a treble sting, not a good all-rounder	3-7g Normal, MM		67
Audio Technica AT-F3/OCC LE £70	Average + Good	Though the 'limited edition' badge is a trifle tongue-in-cheek the 'F3 still offers excellent value	8-15g Low, MC	BB	67
Audio Technica AT-F5OCC £100	Average + Good	Decent output, good channel balance and a thoroughly refined sound sets the standard at £100	9-20g Low, MC	BB	54
Audio Technica AT-F5/OCC LE £100	Average Good +	This latest sample demonstrated some technical weaknesses but its spacious, fluid sound quality still represents a benchmark at this price	4-10g Low, MC	BB	67
Audio Technica ATOC7 £250	Good + Good +	Technically and subjectively this cartridge represents a new dawn for AT, in the twilight of analogue audio	6-13g Low, MC	R	54
Audio Technica ATOC9 £400	Average + Very Good	Tonal colours were reproduced faithfully while stereo images were clearly isolated and focused despite contributing to a thoroughly integrated whole. Slightly less transparent than more costly MCs	6-14g Low, MC	R	60
Audio Technica ART1 £800	Good + Very Good	This is a delicate and very fluid-sounding MC that tracks well, offers very low distortion and exceptionally good stereo separation	9-18g Low, MC	R	72
Azden YMT0VE £12.50	Average Average –	A good tracker. Sounds rather bunched-up but not totally incoherent – for very basic systems only	5-15g Normal, MM		54
Azden GM1E £30	Average – Average –	Of academic interest only, this high o/p MC is seriously flawed in sonic terms	8-18g Low/normal, MC		54
Azden GMP5L £108	Average + Average +	Although no P-mount system will do this cartridge justice, it can still be enjoyed in its universal mode. The subtle balance may prove irresistible to some	4-10g Low, MC	R	54

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CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
B&D MMC5 £24	Average+ Average	Cheapest in the family – smooth treble and good focus, but the bass was left in the wings	5-15g Normal, MM		38 (Summary)
B&D MMC4 £43	Good Average+	Solid and well balanced in the midrange, the '4 lacks bass impact	5-15g Normal, MM		48
B&D MMC3 £57	Good Average	Slightly "laid back" sound quality but a good performer for the price. Best suited to B&O equipment	5-15g Normal, MM		48
B&D MMC2 £87	Good Average+	Only a modest improvement on its cheaper brothers (and sisters)	5-15g Normal, MM		48
B&D MMC1 £112	Very Good Good	Great clarity and detail at high frequencies but a slightly plodding bass. It may appeal more to the classical enthusiast	5-13g Normal, MM		48
Cello Chorale £590	Average+ Good	Now available through a new distributor at a saving of some £300, the Chorale is still blessed with a delicate but highly detailed treble. Arm matching is a problem	3-9g Low, MC		72
Clear Audio Gamma £295	Average Average+	Brimming over with enthusiasm, the unusual-looking Gamma is more than an audio oddity, but it lacks a little subtlety at times	4-11g Low, MC		54
Clear Audio Delta £450	Average+ Good	Midway between the Gamma and exotic Pradikat, the Delta sounds like neither! Nevertheless, it delivers the goods	6-17g Low, MC	R	54
Clear Audio Signature £995	Average+ Good	This latest MC to emerge from Clearaudio features yet another graded version of its proprietary generator. Its sound strikes a balance between the Delta and Prad	4-11g Low, MC		72
Clear Audio Pradikat £1225	Average+ Very Good	Sounded absolutely glorious, creating a full sense of scale and a large well-focused soundstage – but watch for record wear	8-18g MC		Coll
Clear Audio Accurate £2,000	Good Excellent	A remarkable cartridge, not only by virtue of its effortless and highly neutral sound quality but also because this has been achieved with the same basic design as Clearaudio's cheapest MCs	4-11g Low, MC	R	60
Denon DL110 £69	Good Good	Firmly recommended as a fine all-rounder, this high-output moving coil model is likely to perform well in nearly all circumstances	6-16g Normal, MC	BB	48
Denon DL160 £89	Average+ Good	Although listeners just preferred the 110 its brother here proved a twin in lab tests and is still "thoroughly competent"	6-16g Normal, MC		43
Denon DL 103 £99	Average Good	This classic spherical stylus model gives a lively sound with powerful bass, and is popular in broadcast studios	6-16g Low, MC	R	48
Dynavector DV-50X £60	Good Average	A high-output MC model with impressive lab performance, but whose tip and sound quality both disappointed	6-14g Normal, MC		48
Dynavector DV10X IV £60	Average Average+	Fine sounding and realistically priced, damping is recommended to ensure successful tracking ability	8-18g Normal, MC	R	48
Dynavector DV23RS £150	Average+ Good	Sound quality was described as "shut-in", lacking energy and sparkle but with some "edginess" in high frequencies	10-22g Low, MC		28
Dynavector DV XX-1 £360	Good Good+	The XX-1 embodies a power and solidity rarely encountered amongst the breed, nevertheless it did exhibit a peculiarly suppressed character that will suit lively rather than wholly neutral systems	7-17g Normal, MC		60
Empire 800 Mk II £33	Good Average	This very high output MM appears to be based on the classic Ortofon VMS series. A trifle uninspiring overall	7-17g Normal, MM		67
Empire MC-5M £110	Average+ Good	A very low compliance renders this MC best suited to heavy tonearms while its sweet, non-aggressive sound quality earns it a recommendation	13-20g Low, MC	R	67
Empire Benz Micro MC-2 £600	Average Good+	Similar to both the Empire MC1000 and vdH MC2 in design, the Benz offers a warmer and very transparent account of the music. Its tracking prowess is slightly limited	5-12g Low, MC	R	72
Glanz MFG 110EX £24	Average Average	A little bright but giving detailed bass and clear treble this was competitive at the price	6-16g Normal, MM	R	Systems
Glanz GMC-10EH £49	Good Good	The rising HF trend of this high o/p MC may cause problems in certain systems but with a favourable wind its seductive qualities will win out	8-14g Normal, MC	R	67
Glanz GMC-10LX £79	Average+ Average+	Bearing some of the hallmarks of the '10EH, the '10LX is still less competitive in the sonic stakes	7-15g Low, MC		67
Glanz GMC20E £129	Average Average	You could try haggling but we thought the makers of this number were demanding too much lucre for their product	3-6g Low, MC		48
Goldmund Clearaudio £1500	Average+	Something of a mixed bag overall, its sonic character bears a strong resemblance to the Pradikat though it shares some of the hallmarks of the more expensive Accurate	5-12g Low, MC		60
Goldring Elan £15	Average+ Average	A lightweight and frisky-sounding MM that appears to be based upon the same body as the Nagaoka mm4	7-15g Normal, MM	R	67
Goldring Epic II £23	Average Average+	An excellent budget choice though the limitations of the stylus are rather obvious at higher frequencies	5-12g Normal, MM	R	67
Goldring G1020 £53	Average+ Average-	This one strutted finely onto stage but couldn't project to the "gods"	8-16g Normal, MM		43
Goldring G1040 £79	Average+ Average-	High frequency extension was improved by the van den Hul tip, nice looking model – no great actress	8-16g Normal, MM		48
Goldring Eroica L £95	Average Average+	Open and relaxed sounding, the L version is just that bit more refined than its high output brother	7-18g Low, MC	R	54
Goldring Electro II £149 complete	Average Average+	A pretty decent allrounder that did not excel sufficiently to warrant recommendation	8-16g Normal, MC		43
Goldring Excel £500	Average+ Good	Goldring's most expensive cartridge to date errs on the warm and heavy side of neutral. Strong bass lines are its forte though its ability to resolve subtle treble details is weaker	6-13g Low, MC		72
Grace F9E II £240	Good Good	For lively presentation, excellent separation and generally satisfactory sonic delivery – consider this model	5-10g Normal, MM		48
Grado XTE+ I £22.50	Average- Average	Bass and treble are a trifle coloured but the midband proved highly enjoyable. Ideal for budget systems	6-13g (damping) Normal, MM	R	54
Grado XF3E+ £43	Average- Average	Downtilting balance disguises the brightness of this cartridge; bit of a mixed bag at this price	9-20g (damping) Normal, MM		54
Highphonic MCA3 £360	Very Good Good+	Exquisitely crafted by a group of ex-Denon engineers, this superb tracker had a sweet and seductive (if rather bright) treble	5-12g Low, MC		43
Kiseki Blue Silver Spot £395	Average+ Good	Solid performance from a very solid cartridge but lacks some of the magic of other Kisekis. Compliance too high	5-12g Low, MC		54
Kiseki Purpleheart Sapphire £695	Good+ Good+	Rare, beautiful to look at and sweet to listen to, our review of this high-flyer conjured up images of Japanese art	5-14g Low, MC		Collection
Kiseki Blackheart £1595	Good Good	This cartridge demonstrated refined poise and a delicate but at once potent security, however, the price did seem a little on the high side compared to other Kisekis	6-16g Low, MC		60

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CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Kiseki Lapis Lazuli £3500	Good Very Good	Combining very sensible design concepts at a silly price, the Lapis Lazuli is best thought of as combining the detail of the MC3000 and the fluidity of the Clearaudios	4-12g Low, MC		60
Koetsu Black S £599	Average Good+	The S is an OEM design built to Koetsu's blueprint. It features a sturdier fixing plate and offers a brighter, faster and more tactile sound than the earlier K	8-15g Low, MC	R	72
Koetsu Red £896	Good+ Very Good	Named like a rare, and perhaps dangerous, little oriental fish this famous cartridge sounded "almost larger than life"	10-25g Low, MC	R	48/Coll
Koetsu Red Signature £1391	Good Excellent	Technically this cartridge suffers no faults whilst on a subjective level it offers rare musical insight	10-21g Low, MC	R	60
Krell KC-100 £700	Average Good	Apparently based around a similar generator as the Cello Chorale, the Krell provides a similarly light and airy sound. Low mass arms with damping are best used	3-9g Low, MC		72
Linn K5 £30	Average Average+	Not as crisply focused as the costlier Linn magnetics, the K5 offers a smoother presentation	7-15g Normal, MM	R	67
Linn K9 £75	Average Good	Linn threw this model into the leading pack by beefing up the Basik's bodywork, adding a super stylus, and keeping the price fair	6-15g Normal, MM	BB	48/Coll
Linn Asaka £299	Good+ Good+	Disciples of Linn who are trying to realise their true "Karma" may find that saving money is not a short cut to heaven	9-18g Low, MC	R	48/Coll
Linn Karma £435	Very Good Very Good	A specialist which is strongly recommended for Linn-based systems; results may be less predictable in more general application	9-18g Low, MC	R	48/Coll
Linn Troika £669	N/A Very Good	Ex-Karma users have been seen with glazed expressions indicating smug self-indulgence the morning after fitting a Troika	8-18g Low, MC		Coll
London Maroon £109	Average Average+	Now manufactured under the London brandname this Decca cartridge is as iconoclastic as ever	9-20g (damp) Normal, MM		67
London Super Gold £248	Average- Good+	Sometimes a bit fierce in emphasising record surface faults, it is perhaps best at revealing the excitement and tension in music	8-20g + damping Normal, MM	R	48/Coll
Madrigal Carnegie One £685	Average+ Good	Looks like a duck but sounds much better, certainly worth auditioning. Compliance too high	5-11g Low, MC		54
Milltek Aurora £198	Good+ Good+	An overall feeling of relaxed ease characterised this clear and atmospheric Kiseki-built cartridge	8-16g Normal, MC	R	48/Coll
Milltek Olympia £298	Average+ Good+	Warm and detailed sound - packs the punch of the best MCs with high output as a bonus	12-20g (damping) Normal, MC	R	54
Mission 773HC £150	Good Good	A sufficiently well-balanced and competitively priced "old-timer" which still warrants recommendation	6-16g Low, MC	R	38
Monster Alpha 2 £479	Good Good+	In the final analysis this fine allrounder is insufficiently exceptional in any specific respect to justify fully its high price	6-14g Low, MC		Collection
Nagaoka MM4 £8	Average- Average-	Clear punchy sound that delivers the rudiments of a good performance	6-16g Normal, MM	R	54
Nagaoka MP10 £17	Average Average	High frequencies sounded "shut-in" with this spherical-stylus model, but mid and mass were energetic, bouncy and punchy	5-13g Normal, MM	R	48
Nagaoka MP11 Boron £38	Average Average+	Responding well overall in PM's equipment and listening room, this model was mildly criticised for low level and dynamic limitations	5-13g Normal, MM	BB	48
Nagaoka MP10SB £40	Average Average+	Stilton's mods have improved the fine detail resolution of this popular budget model	5-15g Normal, MM	R	54
Nagaoka MP11 Gold £45	Average- Average+	There were mild criticisms directed at most areas, but in general the sound was clear, open and even	3-8g Normal, MM	R	48
Nagaoka MP11 Gold SB £70	Average- Average	Excessive price loading for a blob of aluminium	2-6g Normal, MM		54
Ortofon OM5E £15	Average- Average-	The OM10 is a hi-fi cartridge - the OM5E is not	5-15g Normal, MM		43
Ortofon VMS5E II £14	Average Average	Sound quality was thought fair for the price, though a little 'untidy'	8-18g Normal, MM		38 (Summary)
Ortofon OM10 £20	Average Average	One of the leading "cheapies", this gives a fine level of sound quality for the price, with good matching compatibility	5-15g Normal, MM	BB	48
Ortofon VMS 10E II £21	Average- Average-	Some of its stablemates fared rather better, and showed less evidence of tracking problems to boot	Normal, MM		38
Ortofon VMS20E II £35	Average Average	One of the most popular cartridges ever, sound quality was a bit laid-back and tracking could have been better	3-10g Normal, MM		48
Ortofon OM20 £40	Average Average+	This turned out to be the listening panel's favourite among Ortofon's moving magnet models	5-15g Normal, MM	R	48
Ortofon 520 £50	Average Average+	Very sensitive to load capacitance this new Ortofon maintains the company tradition for a lively, effervescent SQ	7-15g Normal, MM	R	67
Ortofon X1 £50	Average Average	The cheaper X1 scored higher marks with our listening panel than the X3, but both were a disappointment	6-15g Normal, MC		48
Ortofon VMS30E II £52	Average+ Average	Rather an old soldier in relation to turntable technology, it will perform undemandingly in demanding circumstances	5-13g Normal, MM		38
Ortofon MC10 Super £70	Average Good	"What a delightfully sweet-sounding cartridge this is..." we said	5-15g Low, MC	BB	48
Ortofon X3 £70	Average Average	A lack of bass power, definition and a "zitty" top end makes this competent but uninvolving	5-15g Normal, MC		48
Ortofon OM40 £80	Average Average+	Highly competent engineering, secure tracking and decent sound quality are major strengths. But it's a little cold, a little polite	3-8g Normal, MM		48
Ortofon 540 £100	Average- Average	Graced with an advanced FCI stylus our sample possessed too high a compliance for broad arm matching. It could also sound a little unforgiving	3-8g Normal, MM		67
Ortofon MC20 Super £170	Average+ Good+	An "inviting" sound quality; polite rather than exciting it approaches much more expensive models, but does not better them	6-15g Low, MC	R	48/Coll
Ortofon MC30 Super £250	Very Good Good+	Beautifully engineered and well-balanced, it was slightly criticised as bland, though some may appreciate the lack of rough edges	5-14g Low, MC		Coll
Ortofon MC3000 £800	Good Excellent	Quite simply, the most accurate transcription device yet created - not one for the faint hearted	6-16g V. Low, MC	R	60
RATA RP20 £22	Average- Average	Good integration, a clear dynamic midrange and the beginnings of fine stereo imagery merits clear recommendation	6-14g Normal, MM	R	48
RATA RP40 £44	Average Average+	The '40 did a good job of sorting out the layers and complexity of the mix, with good focus, excellent stereo spread and fine scale	6-15g Normal, MM	R	48

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CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
RATA RP70 £77*	Average Average+	Clearer and sweeter than the '40 this also seemed heavier and less lively. For £99 you can have a van den Hul stylus	6-14g Normal, MM		43
RATA RP70vdH £99	Average+ Good	Able to retrieve bags of musical detail (thanks to the vdH stylus). RATA's top cartridge ranks as one of the most articulate MM's available	11-18g Normal, MM	R	67
Rega Bias £34	Average Average+	Difficult to mount in some arms due to its shallow build, the bias offers a gentle, refined SQ that certainly makes it worthy of audition	4-10g Normal, MM		67
Rega RB100 £38	Average Average+	Remarkable mechanical performance in the right system context, but "try before you buy"	5-12g Normal, MM	R	48
Rega Elys £74	Good Good	Clearly superior to the Bias, despite their common heritage, the Elys is both more detailed, accurate and musically convincing	8-15g Normal, MM	R	67
Revolver £20	Average+ Average	This modified AT-95E enjoys a very lively mid and treble even if the bass is somewhat 'slower' in protection. A firm budget buy	8-16g Normal, MM	BB	67
Shure M92E £15	Average- Average	Though lacking depth, the overall sound quality was competent, but treble was not its forte	10-15g Normal, MM		43
Shure M99E £26	Average- Average-	Sister to the 92E this is a solid but not particularly exciting cartridge	5-10g Normal, MM		38 (Summary)
Shure ME75ED £24	Average Average-	Rather bright and splashy in the high frequencies but nevertheless a competent model	5-10g Normal, MM		38
Shure M104E £32	Average- Average	Capable in many ways, but giving no substantial improvement over the 92E in our view	5-15g Normal, MM		38
Shure ME97HE £44	Average Average+	It won't turn a sow's ear of a turntable into a silk purse, but will at least keep going and produce an acceptable result	8-20g Normal, MM	R	48
Shure M105E £45	Average Average-	A slightly 'spitty' sound lacking deep bass and dynamic contrast, but can be used in virtually every system where it will perform "unobtrusively"	5-12g Normal, MM		38 (Summary)
Shure M110HE £55	Average Average	Sound quality was thought eminently presentable, but not exciting; smooth clear high frequencies, but a loss of bass definition	5-10g Normal, MM		38 (Summary)
Shure M111HE £67	Average Average	Early reviews of this cartridge complained principally of the price - which has since come down	5-10g Normal, MM		38 (Summary)
Shure ML120HE £95	Average+ Average+	Quite decent sound quality and a generally fine balanced performance	6-18g Normal, MM		48
Shure ML140HE £120	Average+ Good	Qualitatively the treble of this well-balanced moving magnet model was a match for many moving coil cartridges	6-16g Normal, MM		43
Shure V15 VMR £195	Good Average+	Initial listening gave promising results, but extended familiarity gave the feeling of a lack of energy and a "shut-in" sound	5-12g Normal, MM		38
Shure Ultra 500 £452	Good Good	There was no doubting the accomplishments of what could well be the finest moving magnet cartridge around	6-14g Normal, MM		48
Stilton/AT-F3 £110	Good+ Good+	At a premium of some £40 this modified AT-F3 offers a startlingly refined performance and is strongly recommended	8-18g Low, MC	R	67
Supex SM100E £115	Average Average+	Delivers as much musical information as many moving coils - the bass in particular having an attractive bounce	6-15g Normal, MM		38
Supex SD900IV £350	Average+ Good+	The 900 is an inherently fine cartridge, but despite a recent update it is beginning to show its age	10-18g Low, MC		48/Coil
Supex SD901IV £375	Average+ Good+	This high output model delivered sufficient subjective and objective performance, plus good compatibility, to justify its price tag	8-18g Normal, MC	R	48
Supex SDX2000 £651 L £721 H	Good Good+	The high-o/p 2000 was preferred on listening tests to the low-o/p model, which even so has a unique place among the top designs	6-16g Either, MC		48
van den Hul MC10 £699	Good Good+	A neutral balanced performer giving transparent midrange, fine depth and focus with firm extended bass. Gosh!	5-10g Low, MC	R	60
van den Hul MC One £699	Good Very Good	This extended all the positive qualities of the '10 but added greater authority and scale - worth it for the extra money	6-12g Low, MC	R	60
van den Hul MC Two £899	Good Very Good	Connected directly to any standard MM input the vdH MC Two rewards with a highly detailed yet fluid and musically convincing portrayal	6-13g Normal, MC	R	72

AMPLIFIERS

The amplifier sits at the heart of the system, processing the outputs from all the various music sources as necessary and then driving the loudspeakers. These two (quite separate) functions are integrated into a single box at the low-to-middle price points; separated pre- and power amplifiers become increasingly common as one moves upmarket. At the upper end of the specialist market, valve amplifiers provide a popular alternative to the transistor types amongst enthusiasts.

There is a substantial difference between specialist (sound quality oriented) amplifiers and the consumer electronics style models. The former

are bleakly simple, avoiding all unnecessary features to provide the most direct signal path in the interests of best sound quality. The latter range from models with just basic tone controls and tape recorder switching, to those with elaborate facilities such as graphic equalisers, remote control (including volume), surround sound options etc. etc.

Lab measurement provides some useful data, particularly in regard to an amplifier's ability to drive a wide range of different types of loudspeakers, but this is only obliquely related to sound quality. We also include our measured power output (RMS, 8ohm load, 1 channel driven) - but

again, paradoxically, this doesn't necessarily correspond to the loudness capability of the amplifier, which has as much to do with the elegance of the overload characteristics within a given system (valve amplifiers invariably sound more powerful than their rating would suggest). The listing of features provides some indication to the complexity of an amplifier: many users prefer to retain the option of tone controls to 'shape' the overall sound according to taste; many others have found living without tone controls surprisingly easy, with additional benefits in terms of transparency.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research A07 £280	Very Good Average+	Relatively smooth but ineffectual sound quality that lacks some weight and impetus at very low frequencies	75W, 4 line, 2AV and MM/MC inputs		68
ADC A-2080E £400	Good+ Average+	Clean and neutral sound but one that lacked depth and spaciousness; MM input favoured above MC or CD	108W, logic sw. for 5 line and MM/MC inputs		68
Akai AM-93 £550	Average Average-	Unfortunately Akai's on-board D/A converters were less successful than its conventional analogue CD input.	112W, coax and optical dig inputs. MM/MC		68
A&R Arcam Alpha II £160	Good Good+	Very confident, convincingly musical and punchy sound that sets the standard for other budget amps	41W, 4 line and MM inputs	BB	68
A&R Arcam Delta 60 £250	Good Good+	Very refined and highly detailed sound via MM and CD without any of the harshness noted via the MC stage	59W, 4 line, MM/MC inputs, no tone controls	R	68

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AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
A&R Arcam Delta 90 £350	Good Fair	Well balanced and sweet-natured in any given system with MC capability, but pricey	70W MM/MC 5 inputs tone controls		50
Albarré M408 II £649	Good+ Good+	Unusually styled transistor monoblok power amplifiers reintroduced with improved performance and sound quality. Needs good warm-up for best sweetness and clarity	40W Power amp only	R	56
Albarré M1008 II £899	Very Good Good	A larger version of the similarly styled M408II, fairly good all round but only of average quality for the price	80W, monoblok		62
Aragon 4004 £1795	Good Good	Despite its imposing bulk the Aragon is something of a softy at heart. It can deliver oodles of power but its musical presentation is more laid-back	231W power amp		72
Aria Acoustics Aria 12 £299	Poor Very Good	A plain looking valve power amp that's something of a wolf in sheep's clothing giving many dearer amps a run for their money	12W	BB	63
Ariston Amp £180-200	Average Average+	Slightly veiled and thin sound but proved suitably attractive in the listening tests	32W, full logic control, MM and 4 line inputs	R	68
Audio Innovations Series 300 £425	Poor Good++	Something of an anomaly the 300 is an integrated valve amp that looks awful in the lab but sounds remarkable in a system	10W, MM, 6 inputs	BB	63
Audio Innovations Series 1000/2nd Audio Amplifier £1199/1999	Poor Excellent	This valve combination offered awesome dynamic range with superb transparency and power to match. Compatibility with other brands is unpredictable	15W, MM, 6 inputs, monobloks	R	63
Audio Research SP9 £1698	Very Good Very Good	This new high performance valve FET hybrid preamplifier sets a high standard for versatility, build quality and sound	5 inputs, MM/MC	R	60
Audio Research SP11 II £5250	Very Good Excellent	Current state of the valve preamp art. A reference point	Straight line MM/MC Disc + phase invert	R	60
Audiolab 8000C £325	Excellent Good	A well established preamp with a highly controlled sound, though it could do with more life and depth	MM/MC, 5 inputs, hdph, tone controls	R	62
Audiolab 8000A £350	Very Good Good	A long running and high dependable classic, versatile and consistent via all inputs	50W, MM/MC, 5 inputs, hdph, tone controls	R	62
Audiolab 8000P £495	Excellent Very Good	A dynamic powerhouse, load tolerant and sonically reliable	100W	R	62
Beard Audio CA35/P35mkII £595/£795	Fair+ Very Good	Good build quality and a very smart finish combine with a characteristic valve sound to make a first class amplifier capable of giving hours of musical enjoyment	35W, MM/MC, 4 inputs	R	63
Beard 506 £1195	Good+ Good+	A versatile valve preamp - the bass sounded lively if a touch softened while the treble was detailed but lacked a little sparkle and air	4 inputs MM/MC		50
Beard M70 £1995 pair	Good Good+	A substantial British monoblok power amplifier, but not a great deal more impressive than the P35 at half the price	70W		50
Bryston 12B/4B Pre/Power £995/£1395	Good+ Good	Bryston's massive 4B power amp stood out as the backbone of this combo, the preamp sounding a trifle unbalanced between MM and MC inputs	272W, bridgeable to 800W. 6 line, 2 disc inputs, subsonic filter		68
Cambridge Audio P40 £200	Good Good+	A very fine sounding integrated amplifier with simple facilities and MC cartridge capability	5 inputs 40W MM/MC straight line	BB	50
Cambridge Audio C75 £279	Good+ Good+	Whilst not quite on par with its A75 companion this preamp provided excellent stereo imagery but was a touch "heavy" in character	MM/MC disc	R	50
Cambridge Audio P55 £290	Very Good Very Good	A grown up P40, the P55 suffers slight noise on the moving coil input but offers great sound for the money	55W, MM/MC, 5 inputs, hdph	BB	62
Cambridge Audio A75 £299	Very Good Very Good	This strong power amplifier sounded open and effortless, with fine bass drive and dynamics, albeit a touch grainy and harsh at high frequencies	100W	R	50
Cello Audio Suite £5280	Excellent V Good/Excellent	Cello's preamp represents a whole new ball game in flexibility and sound quality (or war of attrition on your wallet)	Optional inputs MC etc	R	50
Conrad Johnson MV50 £1699	Good+ Good+	Coupled with the PV5, this CJ power amp performed well on audition	50W		Collection
Conrad Johnson Motif MC-8 £1995	Very Good Very Good	A cheaper alternative to the '7, this preamp is an undoubted success in maintaining the Motif sound but does not compare on sound quality	MM/MC	R	50
Counterpoint SA12 £1250	Good+ Good+	A real power-house power amp, beefy and load-tolerant although like the SA7 a trifle untidy at frequency extremes	100W		Collection
Creek CAS 4040 II £179	Good Good	The Mk II has no problems and is a fine all rounder	30W, MM, 4 inputs, tone controls	BB	62
Creek CAS 4140 S2 £219	Good+ Good	Redesigned for '88, this is a fine allrounder with good moving coil input, plain presentation	40W MM/MC 3 line inputs	BB	62
Croft Micro £150	Average+ Good	A real upsetter, this excellent valve preamp put the cat among the pigeons proving good sounds can be made at budget price levels	4 inputs MM straight line	R	Collection
Croft Super Micro A £500	Average+ Very Good	The looks are somewhat improved, while this 'hot rod' version with tuned components performed very well indeed. There is still no gain on the line inputs	4 inputs, MM, straight line	R	57
Croft Series IV(S) £730	Good Good	The original IV is still available now supplemented by the higher price and power (S); both are fine performers	40(60)W channel	R	57
Croft Series IVSA £1000	Good Very Good	Featuring tuned components chosen for their sound quality, the 'A' variant is an impressive example of Croft's technique in valve design	60W special supply regulation	R	57
Deltec DSP-50S DPA-50S Pre/Power £675/£825	Excellent Excellent	Remarkable pre/power combo based around the highly linear DH-0A32 hybrid op-amp. Unmatched detail resolution, control and transparency	63W, external feedback wiring, 3 line, MM/MC no tone controls	R	68
Deltec DPA 100S £2200	Very Good Very Good	A top-quality transistor power amp, sounding fast, articulate and well controlled, though maybe a touch clinical for some tastes	80W	R	50
Denon PMA 250 II £125	Good Fair	Despite a claimed increase in power this competent model now slips behind the competition on sound quality grounds	30W, MM, hdph, tone controls		62
Denon DAP-2500 POA-4400A Pre/Power £549/£599	Very Good Good	Denon's fully-fledged preamp also incorporates D/A converters that did not improve the sound of our £299 CD player. The power amps are brilliant!	172W, monobloks Opt/Coax dig + 2 tape, 4 line and MM/MC inputs		68
Denon POA-6600 £1,000/pair	Excellent Excellent	Delivers abundant high quality sound, solid engineering expertise and content clearly compensating for any compromising of purist audiophile principles	250W monoblok, remote power	R	60
DNM 3A From £1000	Good+ Very Good	The DNM3 in its acrylic case is a remarkably revealing and neutral state of the art preamp	5 inputs MM/MC twin vol controls	R*	44
E.A.R. 802/509mkII £920/£1550	Average Very Good	Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100W, MM, 6 inputs, monobloks	R	63
E.A.R. 549 £3,000/pair	Very Good Very Good	A valve monoblok that measures like a solid state amp is itself an achievement, but exceptional power delivery and bass 'slam' is not fully matched by delicacy and transparency elsewhere	200W monoblok, bias setting		60
Exposure VII/VIII £360/£340	Very Good Good	Supplied as a combination without the separate preamp power supply, this pre power combination performed satisfactorily especially on the moving coil input	50W, MM/MC, 3 inputs, straight line		62

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AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Exposure VI/VII Dual/VIIIS Pre/Power £449/£219/£379	Good Very Good	An established company like Exposure could do more to improve the 'look' of these amps which, nevertheless, sounded confident, dry and musical	63W, Super mod. 4 line and 2 disc inputs with full rec-out switching	R	68
Grant G60AMS £948 pr.	Good Very Good	This neat and compact 60W valve monoblok gave good sound on the 8ohm tap, better still on 4ohms. The midrange was particularly natural	60W monobloks 41 8ohms	R	57
Hafler DH120 kit form £295	Fair	We didn't build one; see below	60W		44
Hafler DH120 assembled £360	Very Good Fair	Sound quality results were decent enough, but this power amp won't set the world on fire at this price	60W		44
Harman Kardon PM635i £159	Good Good	An improved version of the classic PM635 amp which sounds typically dry and articulate. Price is frozen	49W, 4 line and MM inputs A/B speaker	R	68
Harman Kardon 640 Vxi £225	Good + + Good	Moderately priced but built to HK's high standards; good value and good load tolerance	50W MM, 5 line inputs tone controls		56
Harman Kardon PM645VXi £300	Very Good Good	Fits in well with the Harman Kardon series, giving a competent all round performance at a fair price	75W, MM/MC, 5 inputs, hdph, tone controls		62
Harman Kardon PM650vxi £369	Average + Good	A tight and slightly over-damped sound lacks any essential warmth or richness. Reduced headroom on MC	71W, 6 line, MM/MC and true A/V inputs		68
Harman Kardon 655 Vxi £449	Very Good Good	Plenty of well built integrated amplifier for the money, with lots of power to drive almost anything, plus versatile inputs	100W MM/MC 6 line inputs tone controls		56
Harman Kardon PM665Vxi £699	Good Good	A versatile and meaty amplifier with high current capability, but sound quality lags behind certain home grown alternatives	150W MM/MC tone controls (switchable)		60
Inca Tech Dirk £215	Good + Good +	This tiny, minimalist model is effectively a power amplifier with volume control, providing inputs for CD player and tape recorder but not tuner!	50W, 2 line inputs, straight line		56
Inca Tech Claymore £396	Good + Good +	Limited facilities but a strong, clear, well-focused sound results in auspicious <i>Choice</i> debut for this relatively young company	50W MM/MC 3 line inputs straight line	R	56
Inca Tech Claymore S £415	Fair Very Good	Rich, deep and captivatingly musical this amp prompted a very favourable reaction. Disc sens. too high	60W, CMOS logic controls 7 line and MM/MC inputs	R	68
Inca Tech Claymore 2 £515	Good Average +	Very similar to the well-received 'S' via CD our Claymore 2 had a dodgy disc input which ruined its showing	100W, CMOS logic, as 'S' but with more MosFets!		68
ITL MA-80 £169	Good Good	A promising start for this young company, the MA-80 gave a fine sound with CD but was less wonderful on the moving coil input	30W, MM/MC, 5 inputs	R	62
Jadis JP30/JA30 £7,425	Fair Excellent	Two-box preamp plus monoblok power amps, classic valve design gives stereotype valve sound. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at frequency extremes, in lab, and re cartridge matching	30W 2-box pre-, monoblok power, MM-only, 4 line inputs	R	60
Jeff Rowland Coherence One/Model 7 £3750/£4950 each	Very Good Very Good	The technical design of these amps is very elaborate but ensures they achieve an extraordinarily transparent and potent sound. However, the CD i/p is clearly superior to the disc inputs	448W monoblok MM/MC with variable loading options. Balanced topology	R	72
JVC AX-222 £110	Good Fair	Not very impressive, JVC need to pull their socks up if their budget amplifiers are to score	35W, MM, 4 inputs, hdph, tone controls		62
Kelvin Labs Junior/J30 £295/£295	Good Good	Their heart is in the right place but the class A Junior combination is a bit expensive for what you get	20W, MM/MC, 5 inputs		62
Kenwood KA-550D £130	Very Good Fair	Having dropped its moving coil input, this latest version has British style dynamics and rhythm but is not first grade yet	35W, MM, 4 inputs, hdph, tone controls	R	62
Klyne SK5a £2590	Very Good Very Good	Beautifully made and presented this American thoroughbred has a good lab performance, but although versatile, is rather expensive for the quality of sound offered	Balanced output, versatile cartridge loading		72
Krell KSA-200 £5050	n/a Very Good	Value derives partly from excellence of sound, but equally from imperturbability, flexibility, consistency, build and after sales care	200W	R	72
LFD £2,995+	Very Good Excellent	Can set the subjective standards that others merely aspire to, but this outstanding if unconventional multi-box preamp needs careful matching to ancillary components (cartridge, power amp)	MC (with care), passive line extra	R	60
Linn LK1/LK280 Pre/Power £495/£645	Good Good -	A very modern, logic-controlled amp with distinctive and inoffensive sound quality. Its restrained sound could do with extra insight and <i>zip</i>	84W, compact amp CMOS sw. for 2 tape, 2 line and MM/MC. XLR sockets.		68
Luxman LV100 £205	Good Fair	Nicely finished modern integrated amplifier, generally competent though not exceptional	45W MM 4 line inputs tone controls		56
Luxman LV105u £685	Very Good Good	This very well equipped and beautifully finished Japanese integrated amplifier has two valves in the early section of the power amplifier. Pleasant and musical it sets no value for money record here	9 inputs 80W, MM/MC tone controls		57
Magnum A100 £1995 pair	Good + + Good +	Given their massive power rating a pair of A100's make a fine stereo power amp; ideal for high levels and with a wide dynamic range for digital programme	320W		50
Marantz PM25 £125	Good Fair	Soft and sweet like the rest of the range, the PM25 is inoffensive and undemanding	25W, MM, 5 inputs, hdph, tone controls		62
Marantz PM35 £170	Very Good Good	This new generation Marantz is a good allrounder, and shows that extra care is being taken over sound quality; well equipped and versatile	45W MM/MC 3 line inputs tone controls		56
Marantz PM45 £200	Good + Fair	Generally pleasant and polite with above average clarity; there was some softening in the bass, restricting dynamic output somewhat	40W MM/MC tone controls		50
Marantz PM-75 £400	Good Average	More successful than most amps with on-board DACs but still not as balanced as other Marantz products	136W, opt/coax dig inputs, 6 line + MM/MC		68
Marantz PM94 £1,000	Very Good Good	At 23kg the PM94 is no lightweight in either physical or sonic respects. A very powerful and comprehensively equipped amplifier	140W MM/MC tone controls (switchable)		60
Meridian 201/205 £599/£425 each	Very Good Good +	A fine preamp with additional luxury option of full system remote, plus competent and attractive monoblok power amplifiers with generally good performance	100W MM/MC 6 line inputs remote capable straight line	R/—	62
Mission Cyrus One £180	Very Good Good	A red hot class winner, which caused the whole issue to be re-rated! It's even well built - however, the headphone socket will only take a 3.5mm jack	30W, MM/MC, 5 inputs, hdph, straight line	BB	62
Mission Cyrus PSX £230	Very Good Very Good	The PSX does make the Cyrus Two sound better, and also improves the PCM II CD player giving more wallop and clarity	Auxiliary power supply	R	62
Mission Cyrus Two £300	Very Good Very Good	Also a top performer in its group with fine moving coil and compact disc sound. Again, only 3.5mm headphone socket	50W, MM/MC, 5 inputs, hdph, straight line	R	62
Mordaunt Short MS-A5000 £350	Very Good Good	With a recognisable pedigree, Mordaunt Short engineers have made a good job of this one. A musical all rounder	50W, MM/MC, 6 inputs, hdph, tone controls	R	62
Musical Fidelity A1 £269	Good Good +	Fine-ranking in terms of overall sound quality for money, the excessive heat output could be hazardous to your vinyl if you're careless	20W MM/MC 4 inputs straight line	BB	56
Musical Fidelity B200 £299	Very Good Good +	Running cooler than other MFs, the B200 delivered fine musical and dynamic sounds with plenty of power	80W MM/MC 4 line inputs straight line	BB	62

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AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Musical Fidelity Pre 3/P140 £379/£349	Very Good Very Good	Delivering true audiophile sound quality well ahead of their price, both components shine in their own right	70W MM/MC 4 line inputs straight line	R	56
Musical Fidelity A100 £459	Good+ Very Good	This is another one recommended for fine sound with which you could keep your Chinese carry-outs warm	50W MM/MC 5 inputs straight line	R	62
Musical Fidelity P170 £599	Very Good Very Good	Acquitted itself well, later samples showing steadily increasing refinements	85W	R	50
Musical Fidelity MA-50 £875 pair	Good Excellent	An audiophile bargain. One of the best sounding power amplifiers made	50W, monoblok	R	62
Musical Fidelity MVT Mk 3 £1199	Very Good Very Good	The MVT preamp was "strong in its class", providing competition for £1500-plus amplifier systems, now rivalled by the MF3B	MM/MC 5 inputs	R	50
Musical Fidelity P270 £1299	Very Good Excellent	If the hot-box aspect is not a deterrent, this is something of a bargain. A big amplifier scale of sound which is just a little rough-edged	135W	R	50
Musical Fidelity MVX & A370 £2200/£2499	n/a Excellent	In its latest guise, the A370 confirms its status alongside the MVX as amongst the best indigenous components for both sound and presentation	MVX - MM/MC/4 line/phase invert. A370 - 150W	R	72
NAD 3020e £120	Good Fair	A little light in balance and "weight" but superior to run-of-the-mill budget amplifiers	20W MM/MC 4 inputs	R	50
NAD 3220PE £140	Good Fair	Like the 3020E but with more peak power and loudness thanks to the 'power envelope'	20W, MM, 5 inputs, hdph		62
NAD 3225PE £150	Average+ Average+	Light and detailed if not as rich or weighty sounding as others. MM input sounds warmer than CD	42W + 70W dyn. headroom; soft-clipping, MM only	R	68
Naim NAIT 2 £322	Average+ Fair	Well built with good load tolerance the NAIT delivered a fully competitive sound in spite of its modest measured power output. Recent modifications as per <i>FC</i> unchecked	15W pc MM 3 inputs	R*	50
Naim Separates £560-£8,000	Very Good Good	A consistent and coherent series of 'building blocks' for conventional passive or active operation. Sound quality ignores conventional audiophile standards of presentation, but achieves fine musical communication	40-70W, MM/MC etc	R	60
Nakamichi CA-5E £750	Very Good Good	A fine lab performance and high build quality but rather disappointing sound quality for a preamp of this price	MM/MC, 6 inputs, hdph, tone controls		62
Nakamichi PA-5E £1150	Very Good Good	A strong sound in several respects but one which ultimately failed to satisfy	100W		62
Nakamichi CA7E/PATE £2500/£1700	Very good Good/Good+	Exceptional build and finish, plus good general performance, remote control and versatility, but expensive	200W MM/MC 6 line inputs, remote, tone controls		56
Nuance £795	Very Good Good	A subtle civilised pre-amp though a little lacking in resolution and detail; suited to some tastes but not top-drawer	4 inputs MC		50
NVA AP30mc £290	Average+ Good	Utilitarian in appearance but offers a very refined and beguilingly musical sound quality on MC and line	22W only. MC or MM options, 3 line inputs	R	68
Oakley Image £425	Poor Very Good	An interesting valve preamp from Yugoslavia, the Image on first impression needs a bit of tweaking to warrant <i>Choice</i> commendation but is a nice product nonetheless	MM, 5 inputs straight line		63
Drell SA-040 £359	Good Good+	This promising newcomer from a brand new company sounded pretty good and should improve as production settles	45W MM/MC, 4 line inputs, straight line	R	56
Philips FA960 MkII £299	Good+ Average	The MkII '960 still failed to grasp our listeners' attention but it remains a competent amp nonetheless	122W, 6 line & 2 disc inputs + tone controls		68
Pink Triangle PIP £2670	Excellent Excellent	This state-of-the-art preamp is one of the few truly high end products to come out of this country this year. It will most certainly worry the competition	MM/MC, 4 inputs, battery supply	R	62
Pioneer A333 £149	Very Good Fair	A rather average but nonetheless competent performer that is pleasant enough	55W, MM, 5 inputs, hdph, tone controls		62
Pioneer A-616 MkII £180	Good+ Average	The disc inputs sounded a trifle smoother than the CD stage which was harder and more aggressive	95W, 3 tape, 3 line and 2 disc inputs. Heavy		68
QED A240 CD II £169	Good+ Good	Latest 240CD is fine value for CD and has competent MM disc input as well	45W MM 5 line inputs straight line	BB	62
QED A240 SA II £219	Good+ + Good+	Redesigned 240SA represents a significant allround improvement over its predecessor, and provides a good moving-coil disc input in a competitive price	45W MM/MC 5 line inputs straight line	BB	62
QED A270 £329	Good- Good+	Building on the strengths of the '240, the '270 sounds weighty, fast and dynamic. A bit 'lumpy' via MC	51W, 5 line and 2 disc inputs, pre-out	R	68
Quad 34 £285	Very Good Fair	This well-built durable preamp has useful filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4 inputs MM/MC tone controls		44
Quad 405 £349	Very Good Fair	Not an impressive power amp but easy on the ear if not pushed and very reliable	100W		44
Quicksilver Mono £1495	Good Good+	Moderately improved for '88 the Quicksilver still rates well despite up and coming competition	60W monoblok 4/8ohms		57
Radford SC25 £862	Very Good Very Good	A very fair price for a solid, well built valve preamp, combining good allround performance and a neutral sound	5 inputs, MM, straight line	R	57
Radford MA75 £977	Good Very Good	A fine quality valve monoblok with good load tolerance and a neutral accurate sound, offering significant gains in power and focus over the STA25	75W monobloks	R	57
Radford STA25 Renaissance £1115	Good Good+	Offering superb midrange performance if not quite as good at the extremes, the Renaissance valve power amp is a genuine audiophile product	25W	R	50
Revox B150 £875	Very Good Average+	Beautifully constructed but hampered by Revox's convoluted logic control. Open and smooth sound. Still costly.	117W, CMOS sw. for 3 line, 2 tape and MM		68
Revox B250 £1188	Very Good Good	With much improved sound over its predecessors plus amazing remote control facilities, this could form the heart of a round-the-dream-house system	150W MM/MC system/house remote tone controls		56
Robertson Forty Ten £987	Very Good Good	Here is a neat little power amp (60W) you can fit and forget; it proved most satisfying over long listening sessions	60W		Collection
Rose RV-23 £370	Average Very Good	A very attractive little British valve preamp with a sound that was rich, colourful and reasonably sharp via the CD input but was less impressive on disc	MM, 4 inputs, straight line		63
Rotel RA810A £100	Very Good Fair	As a cut price RA820AII this is a very successful little amp that loses little in sound quality to its predecessor. Excellent value	20W, MM, 5 inputs, hdph, tone controls	BB	62
Rotel RA820A £130	Good+ + Good	This A version of an established budget favourite delivers the goods sonically and is fine value for money	35W MM 4 line inputs tone controls	BB	56
Rotel RB/RCB50 £150/£125	Good+ + Good+	Quality separate pre and power amplifiers at near budget integrated amplifier prices. A notable achievement	60W MM/MC 4 line inputs tone controls	BB	62
Rotel RA820BX3 £170	Very Good Good	The latest upgrade is not that impressive, but the BX remains a fine amplifier and now has a moving coil disc input	30W, MM/MC, 5 inputs, hdph, straight line	BB	62

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THE DIRECTORY

AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Rotel RC-870BX/RB-870BX Pre/Power £199/£210	Excellent Good+	Reduced price makes the 870 combo better value but, despite mods to the preamp, it is the power amp that must take the lion's share of credit	128W or 208W in bridged mode. CD direct, 4 line, 2 tape and MM/MC	R	68
Rotel RA840BX3 £220	Very Good Good+	Requires a very long warm-up period but rewards with a refined sound that should suit 'lively' systems	59W, 2 tape, 2 line, MM/MC and A/V inputs	R	68
Rotel RA870BX £300	Very Good Good+	A powerful blockbuster with solid and well focused sound, good versatility and fine load tolerance	85W MM/MC 7 line inputs tone controls	R	56
Sony TA-F200 £130	Average— Average	Over-ambitious protection circuit is hardly in keeping with modern amp design. Lean but 'dead' sound quality.	74W, 2 tape, 3 line and MM/MC inputs		68
Sony TA-F400 £200	Good Average+	Some lack of integration across the frequency range but still offers a more open and detailed sound than the F200	76W, 2 tape, 3 line and MM/MC inputs. Rec-out		68
Sony TAF 500ES £349	Good+ Fair	Not too hot at the price, lacking in bass action, rating poorly on vinyl, and only marginally improving on CD	75W hdph tone controls MM/MC		50
Sony TAF 700ES £500	Good+ + Fair	Scoring higher than the 500 but still not offering the sort of standards set by the competition. But many buttons to push	100W MM/MC tone controls		50
Sumo Nine+ £1200	Very Good Excellent	Macho styling of this class A stereo power amp conceals a sonic subtlety that is exceptional for the price, limited by lots of waste heat and a noisy fan on our sample (being improved)	65W	R	60
Sumo Andromeda £1585	Very Good Very Good	Well made with lots of power from a sensibly sized box. It was good in the lab and demonstrated a sound which offers a fine blend of performance at an almost reasonable price	200W, balanced input	R	72
Tannoy SR-840 £1713	Very Good Good	A "muscle" power amp, capable of impressive levels into difficult loads while remaining quite subtle and revealing	250W		50
Vacuum State FVP £999	Good Very Good	This well thought out valve preamplifier is designed for optimum musicality and transparency, a goal which is handsomely achieved	5 inputs, MM, straight line	R	57
Yamaha AX-300 £100	Good Fair	A lively and dynamic performer, offering a credible if bright sound at a competitive price	30W hdph tone controls (MM)		50
Yamaha AX500 £200	Very Good Good	A well built versatile performer with generous power, decent sound	90W MM/MC 5 line inputs tone, var. loudness		56
YBA Model 3 Pre/Power £995/£995	Good Good	Suited to high sens. loudspeakers this duo produced see-through, ethereal stereo images that were more convincing towards the centre of the soundstage than at the edges	56W stereo amp MM only with 3 line i/p's. Separate L/R volume controls		72
YBA 2 pre & pwr £1395/£1695	Good+ + V Good/Excellent	Superbly finished French audiophile separates, with very good space and transparency, slightly softened bass. Needs extra transformer (£300) for MC cartridges	70W MM (MC extra) straight line	R	56
YBA 1 preamp £2895	Very Good Excellent	A front line French audiophile product. Great stereo and a fine Krell style finish	MM/MC, 3 inputs, straight line	R	62
YBA 1 power amp £2995	Good Excellent	This equally well finished power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85W	R	62

LOUDSPEAKERS

Last item in the hi-fi chain, to some extent the loudspeaker is merely the slave of what has gone before, capable only of reproducing a signal as good as it is fed. Nevertheless the distortions (colorations and stereo effects) introduced by loudspeakers (and rooms) tend to be more immediately obvious than those anywhere else in the chain, so careful choosing according to taste is very important.

The average loudspeaker consists of a smallish enclosure, much of which may have begun life as

part of a tree, plus a couple of drive units hidden behind a removable grille. Inside the box lurks a simple electrical circuit known as a crossover, which divides the incoming (full range) signal into the right bits for the drivers to handle. Variations on the above formula are specifically identified in the entries. The designer's primary task is to balance the **sensitivity** of the loudspeaker (how loud it goes for a given electrical input) against the **bass** extension (how low does it go) for the given box **size**. After that such subtleties as coloration and

dispersion come into the equation.

Careful **placement** of the loudspeakers within the room is as important as the initial choice of model. For good stereo they need to be more or less the same distance from nearby walls, and preferably on similar rigid stands. The listener should be about the same distance from and listening angle to each loudspeaker. The ideal **placement** depends on the way a particular model has been balanced (not to mention a number of other factors); and our recommendation is given in the entries.

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Acoustic Energy AE1 £696	Good Very Good	To the author's knowledge, the most awesomely dynamic and articulate miniature ever made	29.5 x 18 x 25cm semi-open space	88dB/W 60Hz	R	59
Acoustic Energy AE2 £1138	Good Very Good	Dynamic, solid and lively, a great allrounder if a bit small considering the price. AE proves that metal cone/dome drivers really work.	39 x 23.5 x 29.5cm heavy stands in free space	88.5dB/W 45Hz	R	66
Acoustic Energy AE4 £1880 (stands £550)	Uneven Uneven	Magnificent but also seriously flawed, the AE4 possesses tremendous dynamic realism but a very mid-dominant balance. Large rooms and wallets only need apply.	54 x 32.5 x 44cm own stands in free space	90dB/W 40Hz		71
Acoustic Research AR112 £125	Average Average—	Nicely presented and engineered, but sounds a bit small and boxy without true coherence.	36 x 19 x 18.5cm stands near rear wall	87dB/W 75Hz		66
Acoustic Research AR122 £150	Average Average	Despite a promising enough list of ingredients, the 122 failed to excite real enthusiasm amongst the listening panel	38.5 x 19 x 22cm stands near rear wall	87dB/W 68Hz		68
Acoustic Research AR132 £200	Average+ Average—	Good presentation and detail engineering was not sufficient to counter bass heavy balance problems on auditioning	44.5 x 23 x 25.5cm stands 1ft from rear wall	87dB/W 50Hz		66
Alexander 566 £159	Good— Average—	Unusual shape, metal-jacket miniature that works well within limited dynamic range capability; needs free space siting.	40.5 x 11 x 16 narrow stands in free space	83dB/W 70Hz		71
Alexander Aurora £379	Average Good—	The unusual metal case and slim shape of this grown up miniature provide welcome diversity. It sounds pretty good too	42.5 x 14 x 19cm matching stands in free space	85dB/W 55Hz		66
Allison CD6 £290	Average Good—	An unusual cube-shaped model designed for wall mounting gives exceptional bass extension from a small box, though it's also a bit heavy, coloured and slow	28.5 x 28.5 x 28.5cm stands against rear wall	88dB/W 45Hz	R	71
Alphason Orpheus £800	Good Good+	Large hi-tech two-way features unusual, sweet-sounding isodynamic tweeter; well engineered and balanced if a shade odd in appearance	65.5 x 28 x 34cm stands near rear wall	87dB/W 43Hz	R	71
Apogee Scintilla £4990	Good Very Good	These take-me-to-your-leader speakers gave exceptional transparency and can achieve excellent results in a true audiophile system	145 x 88 x 9cm free space on floor	79dB/W 20Hz	R	46/Coll
A&R Arcam Three £149	Average+ Average—	Arcam's baby speaker did not delight our listeners, but it might do better in less expensive systems	34 x 18 x 23cm close to wall at head height	88.5dB/W 95Hz		53
A&R Arcam Two £270	Good Average	Most things to most men this compact is unlikely to disappoint with its lively "bally" character though lacking weight... a bit	38 x 23 x 28cm near wall shelf or 40cm stands	88dB/W 55Hz		59
A&R Arcam One Plus £359	Good Average	Provides a solid, weighty and rich sound, but is a little raw in the treble and indefinite in the midband	22.3 x 28.1 x 37.8cm open space, on stands	88.5dB/W 60Hz		59
Ariston Image £159	Good Average	Good engineering content at a reasonable price, the Image delivers fine stereo with low coloration, but sounded too bassy under our listening conditions	42 x 22 x 27cm stands in free space	87dB/W 55Hz		66

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Audiostatic ES200 £1495	Average Average+	Sounding forward and unbalanced with limited bass power, these excelled in transparency and detail, and might suit some tastes	150 x 53 x 23cm low stands, free space	79dB/W 45Hz		46
Audiostatic ES300 £1995	Average+ Good	Marred by similar problems to its cheaper ES200 stablemate, this line source electrostatic was superb in the upper-mid and treble but lumpy in the bass	44 x 5 x 93cm free standing	82.5dB/W 30Hz		46
Audio Electronics TC10 II £599	Good— Good+	Oddball appearance is rescued by a respectable technical performance, interesting and impressive engineering and fine sound quality at a realistic price.	70 x 33.5 x 33.5cm low stands in free space	87.5dB/W 40Hz	R	68
Avance 120 £279	Average+ Average+	This unusual "after eighties" looking speaker has the recipe for success, but not quite the right seasoning yet	42 x 30 x 30cm 30cm from wall on 40cm stands	86.5dB/W 60Hz		53
B&W DM550 £149	Good+ Average—	Beautifully presented, well engineered near-miniature with precise sound but a distinct lack of 'welligie'. Ideal for considerate flat dwellers	35 x 20.5 x 22.5cm stands in free space	86dB/W 70Hz		71
B&W DM560 £200	Average+ Average—	Fine cosmetic presentation and good engineering for the price; overload protection may be handy but listening panel was underwhelmed	49 x 23.5 x 30cm stands in free space	88dB/W 55Hz		66
B&W LMI Mk II £249	Average+ Average	Probably one of the best 'micros' ever made, worth considering for special applications (boats or vehicles). Upgraded since our review	24 x 15.5 x 20cm shelf or flush mount	86.5dB/W 80Hz	*	31
B&W DM1600 £369	Good Good	Crisp, dynamic loudspeaker with tight but not especially deep bass and a tweeter that sometimes sounds overcooked	49 x 23.5 x 30cm free space, open stands	87.5dB/W 60Hz	R	59
BLQ Q2 £275	Average— Average	Nearly a good loudspeaker, the basic balance is good, but the midband is very uneven and there are severe losses of resolution, 'space' and dynamics	43 x 25.1 x 24.5 semi open on stands	87.5dB/W 70Hz		59
Bose Interaudio 3000XL £140	Average Average—	Lots of perceived value and well enough balanced, but low cost cabinet and driver engineering results in a crude and unsuitable sound	46.5 x 29 x 23cm stands in free space	89dB/W 45Hz		71
Boston A4011 £120	Average Average—	Competent performance for size and price but below average relative to the UK competition	34 x 21 x 20cm on stands near wall	88.5dB/W 63Hz		41
Canton Karat 20 £300	Good+ Average+	Very prettily finished and accomplished near-miniature, the bright-sounding '20's only difficulty lies in justifying its high price	34 x 22 x 20cm stands in free space	87dB/W 55Hz	R	71
Canton Karat 40 £550	Average Average	Pretty and compact three-way for those who mourn the passing of the loudness control — definitely errs on the boom'n'tizz side	50 x 27 x 27cm stands in free space	88dB/W 50Hz		71
Canton 60 Karat £630	Average+ Good	Looks a bit of a throwback designwise, but is nicely presented and has a lively, dynamic and generous sound	58 x 31.5 x 31cm stands in open space	90dB/W 48Hz	R	66
Castle Clyde £149	Average+ Average	A tidy little performer packing punch, but beginning to show its age in the light of new competition	37 x 21.5 x 22cm open space on stands	89.5dB/W 64Hz	R	46
Castle Durham £199	Average+ Average	Listening results were encouraging, well engineered and finished, but lean on treble and a bit weak on bass; still recommended	41 x 21.5 x 25cm near rear wall	89dB/W 67Hz	R	46
Castle Pembroke £309	Good Average+	Comfortably recommended, a sweet smooth sound with good overall balance of engineering-based performance	55 x 37.5 x 30.5cm open space on stands	88dB/W 46Hz	R	31
Castle Warwick £169	Good Average—	Excellent presentation and fine engineering with overload protection, but a sonic disappointment in bass and dynamic qualities	46.5 x 25 x 23cm stands 1ft from rear wall	88dB/W 50Hz		66
Celef Cirrus £180	Average Good	It's nice to see Celef back in the UK, with this decent sounding small reflex box that seems unusually tolerant of siting	39 x 20.5 x 23cm stands in free space	84dB/W 60Hz	R	66
Celef CF2 Nimbus £230	Good— Good—	Nicely balanced overall but a little uneven with it, this lively and dynamic large bookshelf model came close to Recommendation	46 x 25.2 x 24cm stands in free space	88dB/W 55Hz		71
Celestion DL6 Series Two £149	Good Average	Good tonal colouring and plenty of bass for the enclosure size; the metal dome tweeter is excellent, but bass and mid lack clarity and 'bite'	45.4 x 24.5 x 26.2cm near wall, on stands	87dB/W 65Hz		59
Celestion DL8 Series Two £199	Very Good Good	A refined middle market speaker has a smooth but slightly dull quality, with good definition and deep, if slightly boxy bass	50 x 27.5 x 27.8cm open stands	87.5dB/W 60Hz	R	59
Celestion SL12Si £580	Average Average	Careful setting up does reveal elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling	53 x 20 x 27cm matching stands clear of walls	85dB/W 50Hz		66
Celestion SL600Si £799	Good+ Good	This Aerolam high tech miniature has certain remarkable qualities that some will find irresistible, and which go a long way towards justifying the highish price. Needs careful system and room matching.	27 x 20 x 23cm matching stands in free space	82dB/W 52Hz		68
Celestion SL700 £1349 inc stands	Good Good	Very sophisticated, mostly smooth and accurate transducer, with fast but not very deep bass and a rather bright treble	37.5 x 20 x 23.5cm free air on tall stands	83dB/W 45Hz		60
Celestion 6000 £1470	Very Good Very Good	A genuine fullrange audiophile quality speaker system — with Star Wars styling to suit a high tech environment	Complex, on floor in free space	82.5dB/W	R	60
Chameleon 500 £349	Average— Average—	Sounding badly coloured, dull and compressed, it is also amateurishly constructed, despite using good quality materials	38 x 25.3 x 31.3cm free stands	89.5dB/W 75Hz		59
Energy 22 Pro Monitor £600	Good Good	Presentation is a bit rough for the price, but this Canadian entrant is an impressive sonic allrounder that will appeal to most listeners	62.5 x 27 x 30cm stands in free space	87dB/W 40Hz	R	66
Gale 301 £300	Average Average+	Of unusual, distinctive appearance this produced a mixed response, being lively but lacking depth	44 x 23.5 x 22cm on stands quite near wall	86.5dB/W 63Hz	*	46
Gale GS402 £700	Average+ Average+	Clean but rich and powerful bass; stereo focus was not a strong point, but it is worth considering. (Recent revisions not yet checked)	61 x 35.5 x 28cm on matching stands near wall	88dB/W 48Hz	*	46
Goodmans Maxim Two £90	Average+ Average	More wham-bam-thankyou-mam sound that imitates much bigger speakers when you let these babies yell. (A well-controlled yell)	26 x 17 x 19cm near wall on shelf or stand	86dB/W 85Hz	BB	59
Goodmans Point 3 £100	Average+ Average—	Recommended as good value for money, but our listeners' differing opinions mean your ears should judge for themselves	47 x 25 x 20cm shelf/high stand near wall	90dB/W 80Hz	R	53
Goodmans Sterling Point 5s £139	Good— Average—	Looks a remarkably good deal with apparently good engineering, but the room drive is mid-dominant and the sound is loud but not that likeable.	56 x 29 x 26cm stands in free space	89dB/W 60Hz		71
Goodmans Point 7 £180	Average+ Average	Basically competent performance-mix and a lot of speaker for the money, but a certain lack of refinement nonetheless	69 x 33 x 26cm free space on 35cm stand	89dB/W 47Hz		53
Harbeth LS3/5A £330	Good Average	Still a classic miniature, though not to every taste, and none the better for the recent update under our listening conditions. Limited dynamic range	30.5 x 19 x 16cm stands in free space	81dB/W 60Hz		66
Harbeth HL Compact From £499	Very Good Average	The clean and neutral sound lacks resolution and gives rather unsubtle though well differentiated stereo. Can be bi-wired to advantage	52 x 27.2 x 28.1cm open space, on high stands	87.5dB/W 65Hz		59
Heco Interior 430s £399	Good Good—	This tall floorstanding enclosure delivers an impressively even sound balance with good bass extension, if not the lively dynamics to satisfy enthusiasts	85 x 24 x 27.5cm free space	88dB/W 43Hz	R	71
Heybrook Point Five £129	Average Average	Disappointingly prosaic performance on listening tests; wooden and hollow, with restricted dynamics and 'space'. Earlier samples sounded better	37.5 x 23 x 23cm near wall, on matching stands	86dB/W 65Hz		59
Heybrook Point 7 £169	Average Average	Physically an attractive package, but not entirely convincing in lab or listening panel test; interesting for all that	40.5 x 23 x 23cm stands against rear wall	85dB/W 60Hz		68
Heybrook HB1 £189	Good Average+	No longer an over-bright character, a strikingly clear sound and fine transient performance now merits recommendation	47 x 29 x 23cm on stands near wall	88dB/W 61Hz	R	46

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MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Heybrook HB100 £249	Average+ Good	Well matched for wall siting, the HB100 is a lively and informative performer in the tradition of the popular HB1	47 x 26 x 28cm stands near rear wall	86dB/W 50Hz	BB	66
Heybrook HB200 £369	Average Average	This luxury successor to the HB2 is lively and informative, but sounded insufficiently balanced to convince our listening panel	46 x 23 x 26cm stands against rear wall	87dB/W 55Hz		66
Infinity RS2000 £130	Good Good+	Fast, detailed and assured miniature with quick but not very deep bass. The top end is detailed but sometimes jangly	36.2 x 22.5 x 20cm near rear wall, high stands	91.5dB/W 70Hz	BB	59
Infinity 6 Kappa £725	Good Good	Interestingly styled US loudspeaker has unusual high tech drivers and good neutrality, but the sound seriously lacks excitement	63 x 38 x 24cm stands, free space	85dB/W 35Hz		66
Infinity Kappa 8 £1650	n/a Good++	Very nicely made and unobtrusive but large four-way speakers which have a tendency to sound bass heavy unless used with solid core cables	118 x 51.5 x 17.5cm floor standing, open space	89dB/W 33Hz		72
Jamo Concert 2 £240	Good Average-	A thoroughly respectable 'bookshelf' performer that needs free space siting but includes attractive cabinetwork and a neat grille	41 x 24 x 25cm stands in free space	85dB/W 48Hz		66
JBL TLX12 £149	Good- Average	This smart near-miniature has a 'boppy', lively bottom end, but beware of the fizz in its top	37 x 23 x 23cm stands 0.5m from rear wall	87dB/W 55Hz	R	71
JBL LX44 £340	Good- Average	This generously built model offers good power handling, bass extension and dynamic range, but suffers from the 'three-way syndrome' with middle muddle	58.5 x 30 x 29cm stands in free space	89dB/W 40Hz		71
JBL L 60T £449	Good+ Good	Well balanced and offering realistic value for money, the fine treble and extended bass make it suitable for larger rooms	78 x 30.5 x 26.5cm low stands or floor	88dB/W 40Hz	R	46
JBL L80T £649	Good Average	Large scale, dynamic if rather unwieldy sounding, this is a performer of integrity, if not much subtlety	85.1 x 35.6 x 30.3cm floorstanding, open space	89.5dB/W 55Hz		59
JBL 18Ti £599	Good+ Good	Beautifully engineered, well finished miniature with many good points, but unexceptional overall. Try the cheaper L20T	34 x 24 x 22.5cm 50cm from wall on rigid stands	85.5dB/W 53Hz		46
JBL 250Ti £3599	Good+ Good+	In general this speaker did not show the required level of dynamic presentation transparency and stereo depth expected of a pricey flagship model	132 x 57 x 36cm free space on floor	89dB/W 53Hz		46
JPW Sonata £99	Good Average+	Well balanced and integrated, this near-miniature offers fine sound if limited bass and dynamic range, plus real tree wood at a nearly silly price	32 x 23 x 20cm stands near rear wall	86dB/W 55Hz	BB	71
JPW P1 £125	Good Average+	Honest and basically articulate if not very sophisticated, resolution is good but it can sound a little wearing in bright systems or with rough sounding material	44 x 25.9 x 26.1cm free space on stands	89dB/W 60Hz	R	59
JPW AP2 £145	Good Average+	Few grounds for criticism but purchasers should check out the treble qualities to avoid hammering the ear anvils	46 x 26 x 25cm 40cm from wall on 45cm stands	89dB/W 65Hz	R	53
JPW AP3 £210	Good Average+	Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52 x 25 x 29.5cm near wall on stands	90dB/W 57Hz	R	46
KEF C15 £99	Good Average	One of the tinnest around delivers a surprisingly 'big' and well balanced sound, with excellent stereo from free space siting	26.5 x 18 x 14cm stands in free space	85dB/W 60Hz	R	71
KEF C75 £349	Good Good	Compact floorstanding model's Uni-Q driver provides fine crossover integration, giving stable stereo and fine dynamic range within a slightly 'rich' balance	72 x 24.5 x 25.5cm floor in free space	90dB/W 45Hz	R	71
KEF R102 £365	Very Good Very Good	High class near-miniature with expressive, articulate midband and clean, accurate bass and top. The sound quality of the Kube circuitry, however, is suspect; what would an audiophile Kube sound like?	33 x 20.7 x 26.3cm near wall or open on stands	89.5dB/W 60Hz	R	59
KEF 103/3 £680	Good+ Good	Technically impressive, excellent bass/power handling for size, but not for the audiophile system. Better among cheaper components, and good in a large room	56 x 27 x 30cm supplied stands free space	90-95dB/W 35Hz		53
KEF 104/2 (inc KUBE equaliser) £895 (£994)	Very Good Good++	A reference point for dynamics, preferred without KUBE, suited to many rooms. Good stereo, high sound levels	90 x 28 x 41.5cm floor standing in free space	92dB/W 50Hz	R	60
KEF 107 £2025	Very Good Good+	A welcome sense of ease and lack of strain at most normal levels. Minor criticisms included a dulling in the extreme treble. Excellent bass extension	116.5 x 33 x 45cm on floor in free space	87.5dB/W 20Hz	R	60
Linn Helix £279	Average+ Good	Attractive presentation is coupled with an attractively lively sound which is more neutral if less committed than earlier Linn loudspeakers	51 x 25.5 x 28cm stands 1ft from rear wall	88dB/W 53Hz	R	66
Linn Nexus £379	Good Average	Good features include a solid, meaty bass plus good imagery and tonal balance. The catch is that Nexus lacks resolution and timing	49 x 23.5 x 30.4cm near rear wall supplied stands	89dB/W 60Hz		59
Linn Sara £795	Good Very Good	The new Sara is now much smoother and sweeter, with much better imaging. Bass power and dynamics are as good as ever, and the system is no longer as fussy as before	43 x 34.4 x 26.5cm stand mounting, near wall	88dB/W 50Hz	R	60
Magneplanar SMGa £675	Average- Average	Tonally 'rich', in the right room it proved a satisfactory musical experience	122 x 48 x 4.5cm on floor clear of wall	85dB/W 56Hz		46
Magneplanar MG1.4 £1098	Good+ Good+	Replaces the stalwart MG1c with a revised panel layout. Offers a very crisp and articulate sound, particularly revealing of upper mid vocal details	155 x 8 x 57cm open space	88dB 40Hz	R	72
Magneplanar MG2.5R £1897	Good Good	Offers the low coloration and profound musical insight of better electrostatic loudspeakers but without loss of low frequency extension	183 x 56 x 4.5cm Open space	83-85dB/W 35Hz	R	60
Magneplanar MG11a £2650	Good Very Good	Another excellent true-audiophile loudspeaker this American panel speaker helps to convey much of the original character of the music	180 x 62 x 38cm well clear of walls	84-86dB/W 35Hz	R	46
Marantz LD20 DMS £150	Average Average	Recommended more for CD users than vinyl keepers, soundly engineered and built but should be heard before bought	36 x 23 x 24cm free space on 45cm stands	86.5dB/W 55Hz		53
Marantz LD50DMS £200	Very Good Good-	Well behaved larger two-way has fine balance, stereo and integration with good bass extension, albeit with mild 'boxy', 'chesty' and 'fizzy' effects	42.5 x 27 x 28cm stands in free space	87dB/W 50Hz	BB	71
Martin Logan CLS II £3750	n/a Very Good	Much improved high resolution design, fussy about system set-up and demanding of ancillaries and software alike. It rewards the efforts though	60 x 28 x 7.5cm open space	86dB/W 45Hz	R	72
MB Quart 390 £469	Below Average Poor	An aggressive, messy sounding design whose uncouthness undermines the positive level of detail	52 x 31 x 30.5cm open space, on stands	89.5dB/W 60Hz		59
Meridian M30 £775	Average+ Average	Pricy but easy on the ears and worth considering especially where space is at a premium	38.5 x 18 x 32cm free space on stands	Active 40Hz		46
Mission 761 £120	Average Good	One helluva speaker for the price, if a shade small and short of subtlety and refinement - should prove a worthy successor to the 70 and 700	38 x 21 x 21cm stands near rear wall	87dB/W 60Hz	BB	66
Mission 762 £180	Average Average-	Mission's 'bookshelf' middleweight offers high sensitivity and loudness capability, but at the expense of a somewhat untidy and rather 'heavy' sound	50 x 25 x 27cm stand, experiment advised	91dB/W 55Hz		66
Mission 763 £280	Average+ Average+	A very artful combination of generous volume and good bass extension at a modest price. Works well in the listening room despite a few rough edges	77 x 25 x 32cm near rear wall	86dB 40Hz	BB	68
Mission Cyrus 782 £340 (stands £80)	Good- Good-	Lively, articulate and beautifully finished, this compact wall-mount model with twin main drivers has good integration but a rather 'rich', 'loudness' balance	50 x 25 x 32.5cm Cyrus stands near wall	90dB/W 50Hz		71
Mission 764 £400	Good Good-	Large floorstander has fine bass extension but limited dynamic range, and sounds 'lazier' than Best Buy 763	86 x 25 x 32cm 0.5+m from rear wall	86dB/W 43Hz		71
Monitor Audio R100 £159	Average+ Average-	Tonally quite neutral, but with small box character, negligible low bass and a rather 'hard' midrange	40.5 x 25 x 21cm free space on stands	87.5dB/W 70Hz		46

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LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Monitor Audio R300/MD £250	Average Average—	An attractive 'large bookshelf' model that's handicapped by poor crossover and integration between paper cone bass and metal dome tweeter	47.5 x 25 x 30.5cm stands in free space	88dB/W 50Hz		71
Monitor Audio R352/MD £299	Average+ Good	A good value large box that sounds more engaging than subtle, providing a good compromise between bandwidth and sensitivity	64 x 25 x 32cm stands in free space	89dB/W 45Hz	R	66
Monitor Audio R452/MD £399	Average Average	This big, efficient, dynamic sounding loudspeaker has a clean, open treble but a pinched, two-dimensional midband. Can be tiring in the long run	64 x 25 x 31.8cm open space, low stands	89dB/W 55Hz		59
Monitor Audio R852/Gold MD £449	Good Good	Luxury build and 'high tech' tweeter or not, this compact model offers good refinement and detail on an open soundstage	45 x 25 x 26cm stands in free space	86dB/W 50Hz	R	66
Monitor Audio 1200 Gold MD £799	Average Average+	This smooth and civilised slimline floorstanding loudspeaker is well built and nicely presented. But it is also expensive	94 x 20 x 26cm in free space	85dB/W 48Hz		68
Mordaunt Short MS10 II £90	Average Average—	One of the best miniatures around. A borderline Best Buy because of the bass limitations, which may depend on your taste	29 x 20 x 17cm wall bracket	86dB/W 75Hz	R	53
Mordaunt Short MS100 £189	Average+ Average+	A 'mid forward' tonal balance is its main drawback but other aspects such as ambience, transparency and stereo depth compensate	32.5 x 22.5 x 21.5cm stands near wall	85dB/W 80Hz	R	46
Mordaunt Short 45Ti £230	Good Average	A sensitive tandem-bass number that can be driven loud but loses its balance a bit and can be unobtrusive	63 x 26 x 30cm low (20cm) stand near wall	90.5dB/W 52Hz		53
Mordaunt Short MS300 £319	Average+ Average+	Not considered particularly competitive in its class, though it has good power handling and stereo focus	54 x 22.5 x 25cm on stands near wall	89dB/W 65Hz		46
Mordaunt Short 442 £1150	Good+ Good++	A resounding success with the listening panels. Make sure your room can accommodate the bass	95 x 26 x 38cm floor standing in free space	87.5dB/W 40Hz	R	60
Musical Fidelity Reference 2 £199	Good— Good—	This compact wall-mount design with advanced drivers has good dynamics, balance and stereo, plus flashy styling and some midband 'boxy' coloration	38 x 25 x 20cm stands near rear wall	88dB/W 50Hz		71
Musical Fidelity MC-2 £299	Very Good Very Good	This exceptionally clean and clear design offers real subtlety and finesse. Bass quality is light but exceptionally clear; the treble is smooth if slightly shallow	48.5 x 25.5 x 16.5cm open space and stands	87.5dB/W 65Hz	BB	66
Musical Fidelity MC-4 £499	Very Good+ Very Good	Achieving a very high standard, the MC-4 sounds detailed and coherent like the MC-2, but with more bass depth and solidity, and large image scale	56.5 x 26.9 x 29cm open space on stands	87.5dB/W 60Hz	R	59
NVA Cube 1 £600 (stands £200)	Good— Good+	Attractive, cube-shaped semi-omni is very sturdily built, and gives an idiosyncratic but unusually open, spacious and informative sound	33 x 32 x 32cm own stands c0.5m from wall	85dB/W 52Hz	R	71
Opus 3 Capella £495	Good Good	The sound of this Scandinavian curiosity certainly benefits from the crushed marble enclosure, though presentation is strictly DIY	32 x 40.5 x 26(ave)cm amongst books in bookcase	86.5dB/W 45Hz		66
Quad ESL-63 £1538	Good+ Good++	With its unusual but subtle characteristics this classic electrostatic may not be punchy in the bass, but has strengths that some cannot live without	92 x 66 x 27cm open stand well clear of wall	84dB/W 34Hz	R	60
Richard Allan CD5 £242	Average— Average—	This neatly presented small reflex design can sound engagingly communicative, but is flawed sonically and technically and quite expensive too	38 x 19 x 23cm on rigid stands	88dB/W 80Hz		68
Rogers LS7t £399	Good+ Good+	A fine combination of classic qualities at reasonable price produces the "R" tag, but try to get a pair home on approval to check for bass 'heaviness'	56 x 27 x 28cm free space on 40cm stands	88.5dB/W 48Hz	R	59
Rogers Studio 1a £565	Very Good Good—	The classic BBC monitor style sound sensitively updated – transparent and natural with fine stereo, but a touch 'heavy' in balance	63.5 x 30.5 x 30.5cm stands in free space	87dB/W 36Hz	R	66
Rotel RL850 II £130	Average+ Average+	Strongly recommended. Well-balanced, clear, with decent focus and fine stereo, but tendency to 'heaviness' needs decent stands and space	44 x 25 x 24cm free space on 40cm stands	86.5dB/W 50Hz	BB	59
Royd A7 Series 11 £99	Average+ Average	Lively clear sound; good upper bass and dynamics, but treble "ramp" made vocals sound shut in. Try before you buy	31 x 20 x 17cm shelf or 50cm stands near wall	86dB/W 75Hz	R	53
Royd Eden £235	Average Average+	Delightful mid/treble speed and transparency but determinedly bass light, this oddball miniature threatens cult status but could use a sweeter tweeter	31 x 20.5 x 18.5cm stands close to rear wall	87dB/W 85Hz	R	66
Ruark Swordsman £200	Good Average	Very attractively styled and finished, the Swordsman is a well built 'small bookshelf' model that delivered better test than listening results	38.5 x 20 x 27.5cm stands 0.5m from wall	84dB/W 50Hz		71
SO Acoustics OBS £695	Average Good+	Large but unusually pretty, needs a big(ish) room and has a sting at the top, but the transparent dipole midband provides an unusually open and dynamic sound	102 x 35 x 25cm spiked, in free space	86dB/W 45Hz	R	71
SO Acoustics S01 £1150	Average Very Good	A large scale, airy and unusually detailed system with excellent dynamics. Balance is light and bright, and the original model could upset some systems/listeners. Current model has more civilised top-end and warmer overall balance	123.5 x 38.2 x 31.9cm free standing, away from walls	90dB/W 50Hz	R	60
Shan Shimna £280 (stands £75)	Average+ Good—	Pretty little miniature in cast mineral/plastics has limited dynamic range and could sound smoother, but integration is good and box effects slight	31 x 16 x 17cm stands near rear wall	84dB/W 65Hz	R	71
Sony APM-101ES £99	Good Average	Big hearted sound from small bookshelf successor to BB 10ES, sounds a little untidy at frequency extremes, so suits CD better than vinyl!	39.5 x 22.5 x 23.5 stands in open space	86dB/W 52Hz	R	71
Sony APM 10ES £100	—	An obvious Best Buy at its highly competitive price point, it can do justice to a good hi-fi system of Sony or specialist origins	40 x 25 x 20cm, 40cm stands 40cm from wall	87dB/W 55Hz	BB	59
Sony APM 22ES £249	Good+ Good	Sounding notably clear, the 22ES scored well on listening tests was easy to drive and achieved high sound levels	51.5 x 29 x 30cm free space on 40cm stands	88.5dB/W 46Hz	R	46
Sony APM-181ES £300	Very Good Average	Big and beefy but also somewhat fat and bass heavy, this well engineered three-way has notable strengths but lacks transparency and sounds better at lower levels	57.5 x 29 x 36cm stands in open space	87dB/W 40Hz		71
Sony APM 66ES £700	Average+ Average+	Powerful heavyweight sound with a brilliant midband – clear articulate and transparent. But the bass is on the boomy side and the treble can sound grainy	66 x 38 x 36.5cm open space, low stands	89dB/W 60Hz		59
Spendor SP2 £470	Very Good Good+	Conceding little to the SP1, this 30 litre model displayed good tonal balance with a highly articulate midrange, only slightly marred at frequency extremes	50 x 25 x 30cm free space, stands	87dB/W 45Hz	R*	59
Spendor SP1 £710	Very Good Good	A very subtle and musical performer that works particularly well with digital material. An exceptional allrounder	63.5 x 29.5 x 30.5cm stands in open space	87dB/W 41Hz	R	60
Spendor SA3 Passive £1500	—	Same as Spendor SA3 active	85 x 38 x 46cm low	89dB/W 32Hz	R	46
Spendor SA3 Active £2900	Good+ Very Good	Substantial speakers designed to deliver high sound levels and killer bass. Suited to larger rooms and power hungry ears	85 x 38 x 46cm low rigid stands in free space	89dB/W 32Hz	R	46
Spica TC50 £595	Good— Good	This triangular-profile 'grown up' miniature is a shade boxy and laid back but has good rhythmic and musical integrity	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica TC50SE £795	Good— Good	A heavily UK-modified TC50, the SE sounds less boxy and more spacious, but lacks some of the urgency of the standard model	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica Angelus £1195	Good Average	A little bass shy and soft in the bass and lower mid, the Angelus is otherwise tidy, extremely lively and fluid, if uneven overall	116.8 x 53.3 x 26cm free standing away from walls	86.5dB/W 50Hz		60
Studio Power Sapphire £130	Poor Average—	Balance difficulties are improving, though still prevent the potential of this interesting metal-cone new miniature from being fully realised	30 x 20 x 19.5cm stands near rear wall	85dB/W 70Hz		66

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 113

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LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Tannoy Eclipse £120	Average+ Good	Although a little bright, the essentials are right: hear-through clarity at all frequencies, good dynamics, firm bass	38.8 x 22.6 x 21cm semi open on stands	87dB/W 65Hz	BB	59
Tannoy Mercury S £160	Good Good	A fine budget allrounder in the now established Mercury tradition; good balance and reasonable refinement will ensure wide appeal	49.5 x 25 x 21.5cm stands in free space	87dB/W 50Hz	BB	66
Tannoy DC1000 £199	Average Average-	The smaller of two DC models with dual concentric drivers, the '1000 is much less well balanced than the larger, floorstanding '2000	50 x 24 x 25cm	91dB/W 53Hz		71
Tannoy M20 Gold £200	Good Average+	Luxury version of Mercury S with real wood and bi-wire frills doesn't necessarily sound any better overall, but still fine value	49.5 x 25 x 21.5cm stands in free space	87dB/W 50Hz	R	68
Tannoy DC2000 £300	Good Good	Remarkably high sensitivity from unique dual concentric driver that has an involving but characteristic sound. Bass could be better	68.5 x 26 x 27cm floor in free space	93dB/W 55Hz	R	66
Tannoy Westminster £3400	n/a Good+	These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge, flat against rear wall, away from corners	96dB/W (manuf.)	R	Coil
TDL Monitor £1600	Very Good Very Good	Fine solidity and good accuracy, with enough bass extension to satisfy even organ freaks. Needs a big room and can sound a bit lazy and a shade tinkly	118.5 x 30 x 47cm 0.5m from walls	85dB/W 28Hz	R	66
Technics SBC 250 £130	Average+ Average-	Despite a fairly even tonal balance, the 250EK sounded muddled in the midrange and dull in character	36.5 x 23.5 x 20.5cm free space, stands	86dB/W 60Hz		46
Technics SB-RX50 £500	Very Good Average+	With its unique coaxial drive unit the RX50 proved a smooth and well balanced loudspeaker, its minor weakness being a mildly excessive low bass	48 x 30 x 26cm free space on 40cm stands	86dB/W 40Hz	R	46
Toshiba S33-M £90	Average Average	Providing a benchmark for budget loudspeakers, this Toshiba-inspired but UK designed and manufactured model is a lot of loudspeaker for the money, if a shade on the cheap	40 x 26 x 21.5cm stands in free space	86dB/W 55Hz	BB	68
Wharfedale Delta 30 £79	Good Average	Very clear and surprisingly neutral for the price, with good dynamics and stereo within limited volume ceiling	37.9 x 20 x 16.9cm near wall on high stands	88.5dB/W 80Hz	BB	59
Wharfedale Delta 50 £99	Average+ Average-	"There's nothing obviously wrong, but it seems a bit mundane," is what we said when the Delta 50 was £129. But since then the price has dropped by 30 per cent, making it great value	48 x 27 x 19cm near wall on 40cm stands	88dB/W 55Hz		53
Wharfedale Diamond 111 £99	Below Average Average-	This latest version of the long running Diamond sports a better tweeter, but bass, though deep, is soft, and the midband is indistinct and uneven	24 x 18.5 x 20.5cm near wall, stands	86.5dB/W 75Hz		59
Wharfedale Super Diamond £139	Average Average-	Although there are improvements on the basic "legendary" model, listening panelists did not get airborne about this upgrade	24 x 19 x 19cm close to wall at head height	88dB/W 57Hz		53
Wharfedale 504/2 £139	Average Average	Not strictly accurate, this musically involving miniature sounds unusually coherent and well integrated, if a shade dull in balance	29 x 18.5 x 19cm stands against rear wall	84dB/W 60Hz	R	68
Wharfedale 505/2 £169	Average Good	This lively Wharfedale provides plenty of speaker with unusual refinement for the money, and should be fairly tolerant of room siting	44 x 25.5 x 24cm stands 1ft from wall	86dB/W 55Hz	BB	66
Wharfedale 510.2 £299	Average Average-	Even in its latest guise, this loudspeaker still sounds hard, cluttered and lacking innate clarity. The bass is uneven and midband coloured	61.5 x 28 x 29.6cm near wall, high stands	89dB/W 50Hz		59
Yamaha NS 1000M £900	Good Good+	Living up to its monitor label, and tonally well suited to digital material, the NS 1000M is superbly crafted and capable of high levels	67.5 x 37.5 x 32.5cm 30cm from wall, stands	90dB/W 40Hz	R	46

* rating refers to original, tested model.

CASSETTE DECKS

The bad odour of copyright theft hangs around the compact cassette, but there is no doubt it is the world's most versatile and ubiquitous music storage medium. Hi-fi buffs may wrinkle their noses pointedly, but are still happy to use cassette decks to make up tapes for the car or personal - at the same time complaining loudly about the quality of pre-recorded material. (In fact the very best decks can do a surprisingly good job with music cassettes.)

There is no problem in connecting a cassette deck to any normal amplifier, but some care needs

to be taken in choosing the best tapes for a specific machine. (Trial and error is one effective technique, but many decks have manual bias adjustment and some match up to the tape automatically.) Lab performance and sound quality often go hand in hand, and are frequently somewhat dependent upon factory alignment. The mechanical integrity of the mechanism itself is another crucial factor, that is often reflected in the asking price.

All modern hi-fi decks have Dolby B and the majority have Dolby C besides; the very worthwhile

HX Pro system is becoming steadily more widespread. Remote control remains rare, though sometimes it is available as a system option. Three-head recorders allow simultaneous checking of the recording being made. Auto-reverse is a useful convenience feature, but usually with some mechanical compromise, while double-mechanism "dubbing" decks of dubious quality are fashionable at the bottom end of the market. The welter of different 'music search' systems available is some indication of their frequent ineffectiveness.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research RD-06 £280	Average Average+	Acceptable middle market player with very simple facilities and cramped control section, but unusually good looks	Dolby B/C/HX Pro, fine bias, counter memory, repeat		69
Aiwa AD-F370 £130	Average Average	Adequate but uninspiring recorder with detail shortcomings but good control layout and successful sounding with recorded music cassettes	Dolby B, C, HX Pro, bias adjust		63
Aiwa AD-R470 £150	Average Good	For once, an auto-reverse deck with the performance of a decent unidirectional one at a similar price. The Aiwa is modern in concept and execution, and has good, transparent electronics	Dolby B/C/HX Pro, auto reverse, cue & review, bias adjust	BB	69
Aiwa AD-WX707 £180	Poor Average	Not bad value for a twin deck, but marginal from the high fidelity viewpoint. The review sample was poorly set up.	Dual deck, auto-reverse, Dolby B & C, bias adjust		57
Aiwa AD-F880 £300	Good Very Good	Modern sophisticated deck which manages to include some very sound under the skin development work in a rather ordinary (if well polished) exterior	Dolby B/C/HX Pro, 3 head, remote, manual tape calibration	R	69
Aiwa XK-007 Excelia £400	Good Good	Downmarket version of XK-009 with simplified bias/equalisation adjustment section and more forgiving but less informative sound. Still good, but less exciting than XK-009	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment		63
Aiwa AD-WX909 £400	Good Good	Convenience meets sound quality, and both win. An essentially clean, positive recorder which works alongside an auto-reverse player of lower standard - a sensible compromise	Dual deck, auto-reverse, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57
Aiwa XK-009 Excelia £550	Very Good Very Good	Excellent detail, stable articulate midband and slightly obvious treble. The most interesting Aiwa for yonks	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment, CD direct	R	63
Akai GX-32 £200	Average Poor	Constrained and smeared sum this deck well. It has poor bass and treble definition alike, though it proved well aligned for prerecorded cassettes	Dolby B/C, variable bias, headphone out, track search		69
Akai GX-52 £249	Very Good Very Good	Well finished and a pleasure to use this well specified deck sounds clean and defined with all tape groups, with or without Dolby	Dolby B, C, HX Pro, track locate features	BB	57
Akai GX-6 £350	Good Good	There is a strong sense that someone has really thought this one through; it has an indefinable 'specialness'	Real-time counter, track search, Dolby B, C, bias adjust		52
Akai GX-95 £400	Good Very Good	Well designed and finished cassette deck with features well judged to please the audiophile - especially switchable Dolby HX Pro and switchable panel display. The calibration system is simple and effective, and the deck sounds great	Dolby B/C/HX Pro, 3 head, manual tape set-up	R	69
Denon DR-M07 £125	Poor+ Average	There were several problems with the test player that render it an unsafe purchase. This is a pity since despite the antiquated control system, the deck is capable of refined sound quality	Dolby B/C, fine bias adjust		69

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CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Denon DR-M10HX £180	Good Good	Very well laid out, a sensible range of features and smooth cam-operated transport. Replay-only sound quality suspect, but the deck is successful as a recorder – clean, precise but slightly 'grainy'	Dolby B, C, HX Pro, memory counter, bias adjust	R	63
Denon DR-M12HX £220	Good Good+	Well constructed and pleasant to use, a lack of true pitch constancy kept it from sounding superb	Track search, Dolby B, C, HX Pro, bias adjust	R	57
Denon DRW-750 £229	Good Good	Polished and articulate, the only significant shortcoming is poor performance with prerecorded material	Dolby B/C/HX Pro, twin unidirectional, one records	R	69
Denon DR-M24HX £290	Good Good+	This deck will slot into many high grade systems without disgracing itself – or the cassette medium. Very presentable high resolution sound with good stereo with or without Dolby	Dolby B, C, HX Pro, bias adjust, 3 Head	R	60
Denon DR-M34HR £320	Very Good Good+	Prerecorded cassettes sounded grey and dull, but this may have been a sample fault. As a recorder, the DR-M34 is refined and detailed – and good value	Dolby B, C, HX Pro, 3 Head, manual tape calibration, memory counter		63
Denon DR-M44HX £400	Excellent Excellent	A well designed deck that also performed fine sonically, working very well with ferric and metal tapes	Real-time counter, Dolby B, C, HX Pro, tape alignment adjust, remote control, 3 Head	R	60
Dual CC8010 £110	Average Average+	The only limitation worth noting is a slight opaqueness; the Dual otherwise sounds stable and effective. An excellent low-cost design	Dolby B & C, microphone input	BB	63
Goodmans GSW-5200 £90	Poor Poor	Musically unimpressive but at least it's cheap!	Dolby B, twin, one records		69
Grundig Fine Arts CCT-903 n/a (system component)	Good Good—	[Competent part of complete Grundig system]. Solid and well engineered deck with small but significant problems preventing it scoring highly. Basic design generally – and transport specifically – are excellent	Dolby B/C, twin auto reverse, one records		69
Harman Kardon CD491 £695	Good Good+	Excellent audio engineering and tremendous flexibility make this an audiophile cassette deck 'par excellence'	Real-time counter, auto reverse, track search, Dolby B, C, HX Pro, bias adjust	R	52
JVC TD-R411 £180	Poor Poor	Transport irregularity, especially flutter, and poor set-up lead to a sound that although sharp is lacking in body and detail. However, the quick auto-reverse mechanism is nice to use.	Dolby B/C, auto reverse		69
JVC TD-W444 £190	Average Average	The 444 offers a satisfying blend of cost and facilities, but musically it is lacklustre, lacking detail, dynamics and grip. Fair value though	Dolby B/C, twin deck, unidirectional play deck, auto-reverse record deck		69
JVC TD-V711 £380	Very Good Excellent	This is a complex recorder which is built on the back of some important ideas with audiophile roots. It has a (mostly) superb technical performance and is very capable, if not always strictly accurate	Dolby B, C, HX Pro, 3 Head, variable bias, track search, 3 line inputs	R	63
JVC TD-W222 £150	Below Average Below Average	Well endowed but somewhat user-hostile twin deck. Sound quality is very tape dependent, but offers tolerable stability with considerable loss of resolution and scrappy musical presentation.	Dual deck, auto reverse, Dolby B/C		63
Kenwood KX-440HX £140	Average+ Poor	Uneven, unstable sounding player with limited resolving power, but good control layout and finish	Dolby B, C, HX Pro, intro scan		63
Kenwood KX-660HX £170	Good Good	Well designed control system with useful search aids. Sound quality is positive and detailed	Dolby B, C, HX Pro, track & blank search, intro-scan, bias adjust	R	63
Kenwood KX-5010 £269	Very Good Excellent	This important new middle price deck is a well thought through and thoroughly developed design which eschews gimmicks for the sake of musical excellence	Dolby B/C/HX Pro, auto tape calibration, track/intro search	BB	69
Luxman K-105 £349	Average Average	Rating quite well for an auto reverse deck, and featuring complex track search facilities, it was not sonically competitive on price	Auto reverse, track search, Dolby B & C, remote control		52
Luxman K-112 £349	Average Average	Build quality is not truly consistent with the price. Nor is sound, which veers on the warm, lossy side of neutral	Dolby B, C, HX Pro, bias adjust, 3 Head		57
Marantz SD-35 £150	Good Good+	Rock steady tape transport gives very competitive sound quality for the price, but the slightly bright replay may not appeal to some	Dolby B & C, bias adjust	R	52
Marantz SD-45II £200	Good+ Good+	Well built and dynamic sounding player, working better as a recorder than with musicassettes	Dolby B & C, bias adjust Auto selection	R	52
Marantz CP230 £300	Average Average	This is a competitively priced portable recorder though not suited to replay of musicassettes	Dolby B, bias adjust	R	52
Marantz SD585 £500	Average Average—	Sound quality is a little sat upon, and control ergonomics are somewhat opaque, though the twin auto-reverse/recording capability makes this a powerful machine	Dolby B/C, twin auto-reverse & record, parallel recording etc		69
Marantz SD-55 £349	Good Very Good	Slightly tacky feel and restricted signal/noise performance are the main shortcomings of an excellent sounding piece of kit	Real-time counter, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57
Memorex SCT-84 £200	Average+ Average+	The playback only transport is a little disappointing, but the record one is a quality item and the deck works well. Ergonomics are good, but styling and control feel are decidedly tacky.	Dolby B/C, fine bias, twin with auto-reverse record, unidirectional play	R	69
NAD 6300 £550	Very Good Very Good	Solid and homogeneous sound quality and very good replay compatibility thanks to 'play trim'. Distinctive, musical – and costly	Dolby B, C, HX Pro, 3 Head, bias adjust	R	63
Nakamichi CR-1E £345	Very Good Good	Modestly equipped by any standards, the CR-1E stands or falls by its build quality, which is high, and sound which is highly competent	Dolby B & C		57
Nakamichi CR-2E £395	Very Good Good+	Ordinary to look at, in some respects rather awkward to use (tape switching especially), the CR-2E sounds very slightly better than the CR-1E, and therefore ranks well. But it doesn't come cheap	Dolby B & C, bias adjust, remote control	R	57

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CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Nakamichi RX-202E £545	Good Very Good+	Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control system	Auto reverse, Dolby B, C, 2 Head	R	63
Nakamichi CR-3E £595	Very Good Very Good	The user interface is a little clumsy, though conceptually straightforward. Sound quality approaches the CR-4E, and is amongst the best at the price.	Dolby B & C, bias adjust, remote control	R	57
Nakamichi CR-4E £745	Very Good+ Very Good+	High class deck with a reasonably full range of features and superb sound at a slightly unlikely price	Dolby B & C, bias adjust, remote control, 3 Head	R	57
Nakamichi CR-5E £995	Excellent Excellent	A slightly simplified version of the all-conquering CR-7, the CR-5 has a very similar standard of audio performance – the best	Dolby B/C, fine bias, 3-head	R	69
Nakamichi CR-7E £1500	Excellent Excellent	Remarkably this deck is not only ergonomically but also sonically superior to the Dragon, particularly on record/replay	Real-time counter, track search, Dolby B & C, tape alignment adjust, bias adjust, remote control, 3 Head	R	60
Nakamichi Dragon £1750	Excellent Excellent	Previous to the birth of the CR-7E, this machine stood head and shoulders above the rest. It is still the ultimate for music cassette replay	Auto reverse, Dolby B & C, tape alignment adjust, bias adjust, remote		60
Onkyo TA-2120 £130	Average+ Good	Clear, vivid sound with good timing and resolution when using Type II tapes without Dolby. The controls are less inspiring – the meters in particular are plainly inadequate	Dolby B/C, auto tape sensing, block/side repeat	R	63
Onkyo TA 2130 £160	Average+ Average+	Rating fairly well on both pre-recorded and record/playback, ergonomics were a little poor but overall performance was generally consistent	Track search, Dolby B & C, bias adjust		52
Philips FC566 £179	Average+ Average+	Mostly well equipped, though some tape search facilities fail to exploit the auto-reverse capability. Sounds clean and stable – with prerecorded tapes too	Auto reverse, track search, Dolby B & C		57
Philips FC567 £279	Average Poor	Well equipped but ergonomically substandard; sound quality is messy and lacking in clarity and dynamics	Dual deck, auto reverse, track search, Dolby B & C		57
Pioneer CT-443 £180	Average Good	Structurally sound and subtly musical recorder. Sophisticated, mildly damped sound quality	Dolby B & C, fine bias adjust, track search	R	63
Pioneer CT-737 £300	Average– Average–	Interesting design and a pleasure to use with rather too many rough edges to really work properly	Dolby B, C, HX Pro, 3 Head, bias adjust, memory counter		63
Pioneer CT-939 £450	Excellent Excellent	High grade and easy to use cassette deck featuring a state of the art transport. The audio amplifiers are not quite in the same class, but fail to seriously damp enthusiasm for an excellent package.	Dolby B/C/HX Pro, 3 head, real time counter, variable bias	R	69
Proton AD-200 £140	Poor Poor	Sound quality is essentially on a par with many portables, and has nothing to do with high fidelity. The main problems are an unrelenting hardness and an almost total lack of detail	Dolby B & C		57
Proton AD-300 £200	Average– Poor	High levels of flutter give sound a roughness and coarseness that rules it out for high quality work. The record and replay electronics certainly deserve better	Auto reverse, Dolby B & C		57
Revox B215 £1461	Good Average+	Superb engineering and good sound, but lacking the subjective qualities that characterise the very best hi-fi equipment	Real-time counter, Dolby B & C, tape alignment adjust, remote control		52
SAE C102 £549	Average+ Good	Looking most unlike a cassette deck designed in the States and proving competitive in its price group. Not sonically that outstanding, however	Real-time counter, track search, Dolby B & C		52
Sansui D-X301i £150	Average+ Good	Lively, informative and well equipped basic deck, if rather obscure operationally	Dolby B/C/HX Pro, variable bias, track search	R	69
Sony TC-FX 150 £90	Average+ Average+	Recording and playing back on this deck itself gave acceptable results, whereas prerecorded stuff was a joke. But it's a good £90 worth	Dolby B & C		52
Sony TC-W300 £150	Poor Poor	Deeply unimpressive and messy sounding deck with bloated quality and poor pitch integrity. Dubbing performance substandard	Dual deck, Dolby B & C		63
Sony TC-RX50 £180	Average– Poor	Terminal inability to play at a steady pitch, or (on prerecorded material) in tune spoiled this simple but otherwise attractive design	Auto-reverse, Dolby B/C/HX Pro		63
Sony TC-WR500 £200	Poor Poor	In many ways a curiously old-fashioned package which lives up (down?) to stereotypes about twin cassette decks	Twin Dolby B & C, 1 records, both auto-reverse		69
Sony (WMD6C) ProWalkman £249	Good+ Excellent	"One of the finest sounding cassette decks on the market today. A mandatory Best Buy, which also fits in your pocket"	Dolby B, & C	BB	60
Sony TC-RX60ES £250	Average Average	For once a stable sounding auto-reverse deck but sound quality is rather 'dirty' and compressed, especially with Dolby C	Auto-reverse, Dolby B/C/HX Pro, auto tape recognition		63
Sony TC-RX80ES £350	Average+ Good	Clean, powerful and detailed sound, especially without Dolby C. Stable pitch – but prerecorded cassettes sounded disappointing	Auto reverse, Dolby B/C/HX Pro, bias/level adjust	R	63
Sony TC-K700ES £499	Excellent Excellent	Firmly in the esoteric league, this is easy both to operate and to listen to. Best points: first class imagery, focus and stability	Track search, Dolby B & C, tape alignment adjust	R	60
Teac V-250 £89	Average Average	Ultra-basic design which works quite well. Lack of pitch integrity is the main shortcoming, but it wasn't always noticeable	Dolby B	R	63
Teac V-270C £109	Average– Average–	Not quite cheap enough to compete solely on price, the V-270C is a rather messy and unstable sounding deck	Dolby B & C, bias adjust		63
Teac V-570 £199	Average+ Good	Metal tapes are not exploited well by this deck, and prerecorded tapes sounded very disappointing. But the underlying sound quality sets a very high standard, assisted by clean electronics and an excellent transport	Dolby B/C/HX Pro, fine bias adjust	R	69
Teac V-670 £249	Average Average	This deck is worth considering, but much has been sacrificed for the third head, both musically and in the range and type of features included. Worth considering	Dolby B/C/HX Pro, fine bias, 3 head/off tape monitoring		69
Teac R-515 £299	Average+ Average+	Expensive, this deck is basically a competent but pedestrian performer which will not fully satisfy the critical user	Real-time counter, auto reverse, Dolby B & C, bias adjust		57
Teac W-460C £299	Good Average	Musically this deck is a little lacking, given the price and despite a notably fine transport section. Nevertheless well worth considering if the programming options appeal.	Dolby B/C, twin unidirectional, one records. Programme memory		69
Teac V-870 £399	Good+ Good	Cut-down V-970X for the proletariat. Expensive and carefully engineered with mostly very good but slightly cold sound quality	Dolby B, C, HX Pro, 3 Head, manual tape calibration	R	63
Teac V-970X £499	Very Good Very Good	An excellent sounding deck with useful features (tape calibration etc) that fully justifies the price	Real-time counter, track search, Dolby B/C/dbx & Dolby HX Pro, bias adjust, remote control, 3 Head	R	57
Teac W-990RX £499	Good Good	A mess with dbx, but taut and articulate otherwise. The 990, though expensive, has a powerful range of features, making it one of the few really ambitious decks to successfully straddle both sets of requirements	Dolby B/C & dbx, dual auto-reverse/record, parallel & sequential recording, remote	R	69
Technics RS-T230 £160	Average– Average	Satisfactory with prerecorded material but otherwise unexceptional, the main features of this deck are its excellent user interface and value for money	Dual deck, Dolby B/C		63
Technics RS-B355 £140	Good Good	Good sound let down by inadequate meters and poor prerecorded replay only sound quality	Dolby B, C, microphone inputs, cue and review	R	63
Technics RS-B505 £160	Average+ Average+	Neatly made recorder with Dolby HX Pro that sounds precise and stable, though sometimes a little processed and grainy too	Track search, Dolby B/C/HX Pro		57

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THE DIRECTORY

CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Technics RS-B605 £180	Good Average+	Mixed but generally good sound. Weakest points are dbx and prerecorded sound, best are Type IV (metal) recordings which sound sharp and precise	Track search, Dolby B/C/HX Pro & dbx		57
Technics RS-T330R £200	Average+ Average+	One of the very few dual cassette decks with any real pretensions to audio quality, the RS-T330 is a considerable success musically as well as being a pleasure to use	Dual deck, Dolby B & C	R	63
Technics RS-B705 £250	Average Average-	3 heads for the price of two, but not the sound quality to go with them	Track search, Dolby B, C, HX Pro, bias adjust, 3 Head		52
Technics RS-B905 £350	Good Good	Good, well set up cassette deck with a clean, accurate sound but some compression. dbx circuit sounds poor	Dolby B, C, HX Pro, dbx, bias adjust, 3 Head		57
Technics RS-T80R £400	Poor Poor	Flexible and pleasant to use but poor transports led to poor sound on our latest sample	Dual deck, auto reverse, track search, Dolby B, C, dbx		52
Yamaha KX-200 £120	Good- Good	Cheap, well-equipped and workmanlike with the sound quality less obviously processed than most - the whole is more than the sum of the parts	Track search, Dolby B & C, remote control	R	52
Yamaha KX-300 £150	Average+ Average-	Uncommonly well equipped and adequately made and presented, this model turned out to be a disappointingly uncertain proposition on audition	Track search, Dolby B, C, HX Pro with 'play trim', bias adjust, remote control		57
Yamaha KX-400 £200	Good Good+	A highly commercial package with every widget under the sun. Happily it sounds good too.	Auto reverse, track search, Dolby B, C, HX Pro, remote control	R	52
Yamaha KX-500 £210	Very Good Very Good	An accomplished performer, strongest in the areas of pitch and spatial stability, but slightly rough around the edges	Real-time counter, track search, Dolby B/C/HX Pro with play trim, bias adjust, remote control	R	57
Yamaha KX-800 £330	Good Average	The present Yamaha range seems oddly inconsistent. This sophisticated model sounds fine (almost) but came a clear second best to the KX-500	Real-time counter, track search, Dolby B, C, HX Pro with play trim, bias adjust, 3 Head		57
Yamaha KX-1200 £500	Excellent Average+	A veritable rats' nest of buttons and dials, albeit well laid-out. This is nearly a great recorder, but lacks simplicity of sound	Real-time counter, track search, Dolby B, C, dbx, HX Pro, bias adjust, remote control		52

DAT RECORDERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa Excelia XD-001 £1300	Very Good Very Good	Clear and very listenable recorder roughly comparable to but slightly sweeter sounding than the Sony DCT-1000ES - but with an inferior front panel design	Track ID and search, remote	R	63
Grundig Fine Arts DAT-9000 n/a (system component)	Good Good	Conventional DAT recorder offering standard facilities. The deck is well made and equipped, and is engineered to a satisfactory quality standard. It performs to an acceptable standard, though it is not state of the art	2/4 hour recording, mic inputs, digital in/out		69
Luxman KD-117 £1499	Good Good	Slightly soggy, earth-bound sound quality, this model trails the other DAT decks tested so far	Two analogue inputs, remote twin address		63
Pioneer D-1000 n/a	Excellent Excellent	Fine, clear, colourful and consistent sounding deck. The Pioneer is lavishly (uneconomically?) constructed and equipped. It shows what is possible, but will probably never go on sale	Many search and memory facilities	R	63
Sony DTC-M100 £799	Very Good Very Good	Clean, clear sounding 2nd generation model with most of the features and sound of the DTC-1000ES	Mid-width, alpha-numeric display, remote, optical interfaces	R	63
Sony DTC-1000ES £1299	Very Good Very Good	Fine, consistent performer with accomplished tape handling and good build quality	Standard track ID and search, remote	R	63

CD PLAYERS

This all-digital music source is well established, despite still high disc prices and the opposition of many hi-fi enthusiasts. Compact Disc's strengths over conventional vinyl are complete freedom from surface noise with automatic and programmable play, plus track skip and fast music scan - frequently under full remote control. However, many vinyl enthusiasts find CDs sound less involving than

top quality vinyl replay.

Introduced five years ago at around £500, CD players now average less than half that price, and for the main offer improved performance besides. Even cheaper players may have the latest decoding chips and the most useful play features; extra money can buy remote control, remote volume control, audio 'tweaks', plus improved build and component

quality control.

Compared with many hi-fi components, CD players give impressive lab performance, though there are differences between players nonetheless. Sound quality variations are even more marked, particularly in a good quality system. As it behaves very like a preamp, there are no problems connecting a player to a normal amplifier.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
ADC CD 2000E £330	Good+ Fair+	One of the slimmest players in the business but nothing special inside. Nice ergonomics but overpriced	Remote, timeshared 16 bit		64
Aiwa DX-M45 £149	Fair Fair	Cutdown Philips technology, but results are quite good for this British made machine	Manual	R	64

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CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Marantz CD75HSE £350	Very Good Very Good	Remote volume version of the 65 SE with an optical digital output as well. A sonic superiority complex in a cheap plastic box	Remote volume, hdph socket, FTS, optical output etc	BB	70
Marantz CD85 £500	Very Good Very Good	This player may just miss a top sonic rating but it's well made and has plenty of features befitting a Marantz heavyweight	FTS, key pad remote, comprehensive display, programming, optical output etc	R	70
Marantz CD94 £800	Good+ + Very Good	Clearly the best Marantz CD player, with high build quality and good objective and subjective performance	10 digit keypad, headphone socket, favourite track selection, remote	R	58
Marantz CD94/CD494 £1600	Very Good Excellent	Taking its logical place at the top of the Marantz CD hierarchy, this two-box combination delivers reference standard lab and listening test results, albeit at a price which seems a little steep. Very refined	Favourite track selection, remote, balanced output etc	R	60
Marantz CD12LE £2500	Very Good Very Good	This may be very expensive but it is very well made. Technical performance is very good and the sound is the best from Marantz yet	Two box, digital processor, FTS, optical connection, hdph socket, comprehensive display, balanced output etc	R	70
Meridian CD207 £1050	Very Good Excellent	The 207 matures with age and in its present form it offers one of the best sounds around plus great packaging and versatility through its preamp options	On-board preamp, options, two box, coax digital output, remote	R	72
Micromega CDF1 Classic £1400	n/a Very Good	A very well made and stylish player from France, the CDF1 is a CD player for analogue lovers or as close as we've come across	Basic remote, digital output, suspended chassis	R	72
Micro Seiki CDM100 £3850	Very Good Good	One of the hernia inducing bricks of hi-fi, the Micro is extravagantly styled, finished and built. The good lab performance led to an 'only good' sonic display when the price demanded excellent	Balanced output, remote, display blanking		72
Mission PCM2 £500	Good+ Good	A matured design with good features it is the best sounding power volume player available, it even tests well. It accepts the £200 PSX power supply option	Remote volume, display and phase invert	R	64
NAD 5220 £230	Average— Poor	Conforms sonically to a stereotype of the medium that most players have grown out of. Hard, thin and raw sound with poor stereo and resolution.	Time/track display, memory		62
Nakamichi OMS-1E £395	Good Good	This neat enough player doesn't really follow the Nakamichi tradition of providing exceptional sound quality while at the same time perpetuates that of selling at an above average price	Simple remote etc.		58
Nakamichi CDP-2E £495	Very Good Good	It's ergonomically superior and has above average sound, but it isn't cheap. The standard of build quality and finish is first class which isn't quite matched by the sound quality	Programming, hdph, remote track entry, digital output		70
Nakamichi OMS-3E £995	Good Good	Superbly built and presented this expensive machine was a bit of a "stuffed shirt" when it came to sound quality	Remote control, skip and scan, headphone socket		51
Nakamichi OMS-4E £1200	Very Good Very Good	Solidly controlled and comparatively simple this clearly represents one of the major benchmarks for CD sound quality, though the midrange sounded a touch thin	Skip and scan, headphone socket		51
Nakamichi OMS-5EII £1500	Good+ Very Good	"... delivers near state of the art performance and build quality in a deliberately starkly functional package, but at a very high price..."	Skip and scan, simple track programming, manual control		51
Nakamichi OMS-7EII £2000	Good+ Good	The only serious criticism here is of the price. And in our not always humble opinion you can get better sound quality for less elsewhere in Nakamichi's range	10 digit track entry keypad programming, headphones		51
Onkyo DX-1500 £170	Average Fair	Ruled out on the grounds of its poor DAC filter, but it's not so bad really given the price	Manual, 2x 0/5, timeshared 16 bit		64
Onkyo DX-3500 £250	Very Good Fair	It offers a lot of facilities and fine build quality for the money. Lab performance is very good but the sound quality doesn't inspire	Key pad remote, memory, hdph socket, comprehensive display etc		70
Onkyo DX-7500 £450	Good Very Good	This comes close to the state of the art performance in many areas. It has lots of facilities and is well made too.	Key pad remote, memory, hdph, very comprehensive display, optical digital output etc	R	70
Philips CD582 £200	Very Good Good	Build quality and finish are only adequate but in every other respect it's more than competitive	Simple remote, programming, large display, hdph socket	BB	70
Philips CD473 £229	Good Good	In the forefront as regards sound quality, this is one of the best sounding Philips players yet; we were unable to catch it out on classical through Jazz program	Favourite track selection, remote control with volume, headphones etc	BB	58
Philips CD782 £230	Very Good Good	In the present market this Philips offers an amazing performance in all areas at a most affordable price. The styling is a little bland	Versatile volume remote, FTS, variable headphone socket etc	BB	70
Philips CD880 £500	Very Good Very Good	The '880 is an impressive blend of luxury build quality and features at a far from extravagant price, and also delivers the subjective goods.	Volume remote, FTS, menu display etc.	R	60
Pioneer PD4100 £170	Fair Good	It's not perfect in the lab; the facilities are few, but the sound quality sets it apart	Programmable, skip, search, repeat	BB	70
Pioneer PD5100 £220	Fair Fair	It's well made and has good facilities. The lab performance is generally fine, but it's only average for sound quality	Remote, volume, programming, hdph socket, etc		70
Pioneer PD-6100 £249	Good Good	A budget audiophile player; fine sound even if its lab performance seems a little uneven	Full feature remote, digital output, variable hdph	BB	64
Pioneer PD-M500 £269	Good Good	A high performance autochanger for the money, good value all round and generously featured specification	Full remote, digital output, variable hdph	BB	64
Pioneer PD7100 £300	Good Good	External build quality is fine, the level of facilities are lavish, but the sound it produces only just takes it into the good category	Remote, volume headphone socket, versatile programming, faders etc		70
Pioneer PD-M700 £400	Very Good Fair+	Top class autochanger, surprisingly fast, high specification and a good allrounder	Remote, optical digital output, headphone socket		64
Pioneer PD-91 £800	Excellent Excellent	Close to state of the art in nearly all areas - soundstaging, clarity and simple lack of artificiality. A well made and sophisticated player	Track entry remote, calendar display, index search, etc.	R	64
Revox B126 £649	Very Good Good	Made in Switzerland so the build quality and technical performance is high but then so is the price and the sound quality is only good	Programming, Revox remote system compatible		70
Revox B226 £756	Good+ Good	The traditional Revox house style is combined with the fine Philips 16 bit chip set, but this player doesn't really offer sound quality to match the price	Infra-red remote control, full search, scan, programming		51/Coll
Rotel RCD820B £210	Good+ Fair+	A budget Philips based player of dependable sound quality and offering very good value. Build is a touch lightweight	Remote, basic facilities	BB	64
Rotel RCD820BX2 £250	Good Very Good	Start with a good base and then make it sound better, the '820BX2 CD player maintains the reputation established by its namesakes, and comfortably deserves Recommendation.	Direct track entry remote etc.	R	58
SAE D102 £700	Good Good	Considering the high price of this player, most of the innards seem fairly prosaic. Sound quality and lab performance are both respectable enough, but hardly justify the price premium involved, though styling is unusual.	Remote (inc volume), skip, scan etc.		58
Sansui CD-XM510M £299	Average Fair	Not designed to appeal to the audiophile, but with its 12 disc facility it's ideal for background music or as a second player for the kids	12 Disc, 2 magazine autochanger, comprehensive remote, programming etc		70
Sansui CD-X501i £300	Fair Fair	Weak dynamic range for an upmarket player which shows in both lab and listening tests	Remote, programmable, digital output, headphones		64
Sansui CD X701i £449	Good Good	A stylish attractive player which sets itself apart from mainstream mediocrity by means of its external appearance. It works well too, has plenty of facilities and good sound quality.	Remote, key pad track access, digital output, variable headphone socket etc	R	70

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Sharp DX150 £129	Fair Fair	This is a none oversampled player which is rather outclassed for technical and sonic merit by the vast majority of the competition. Pretty enough but would you want to put discs in it?	Programmable, skip, search, repeat		70
Sharp DX750 £179	Fair Fair	It has a remote control but it's too like the 150 which is rather outclassed for technical and sonic merit by the vast majority of the competition	Remote, programmable, skip, search, repeat		70
Sharp DX-620 £200	Good Good	A surprising achievement but it shows what can be done. Another high value budget package	Remote, headphone output, 2x 0/S, timeshare 16 bit	BB	64
Sharp DX-R700H £225	Average— Poor	A workmanlike player that does not offer exemplary lab or sound quality but which is well-built with good facilities and should perform well in use	Remote control, track selection keypad, skip, scan repeat programming		53
Shure Ultra D6000 £495	Average+ Fair	Ergonomically well thought out with full function remote control, but not really scoring sonically considering its price	Remote control (full function inc volume)		51
Sonographe SD1 (by CJ) £799	Good Very Good	Distinctive with oak end-cheeks, using Philips based 14 bit x 4 oversampling, Conrad Johnson electronics make this a musically rewarding player	Full search programme and timing	R	51/Coll
Sony CDP-M35 £170	Fair Fair	There is no disguising the lightweight plastic construction of this player, but the technical performance, sound quality, aesthetics and ergonomics all deliver more than one has the right to expect for £170.	Skip, scan, programming etc.	R	58
Sony CDP-350 £180	Fair Fair	A fairly basic machine. The lab test showed up some faults and it didn't do particularly well sonically	Programming, skip, search, repeat, hdph socket		70
Sony CDP-M55 £190	Fair Fair	£20 buys a remote control handset to operate your M35. Sony call it an M55 (see CDP-M35 review).	Simple remote, skip, scan, programming etc.	R	58
Sony CDP-550 £200	Good + Fair +	Another dependable Sony, it doesn't have a digital output but at the price who's complaining? Fit and forget	Full remote headphone output, 4x 0/S	BB	64
Sony CDP-M75 £230	Good Good	This midi version of the '750 saves £20 on the price (see CDP-750 review).	Track entry remote, menu display ect.	BB	58
Sony CDP-750 £250	Good Good	A seductive blend of fine presentation and solid performance, all at a very realistic price that should ensure its success.	Track entry remote, menu display etc.	BB	58
Sony CDP-C50M £250	Fair Fair	The Sony concept of an autochanger is interesting and executed with characteristic thoroughness. The lab and sound test results reveal it to be of only average quality	Carousel autochanger, remote, multi disc programming, variable hdph socket		70
Sony CDP-M95 £280	Very Good Fair +	Very well equipped mid sized player fine build and finish, incorporating Sony's custom file disc labelling	Remote, programmable, variable hdph output	R	64
Sony CDP227ESD £400	Good Good	The cheapest of the ESD range offers plenty of ergonomically arranged facilities. It performed well in both the lab and on the listening tests, and its reasonable price makes it hard to miss	Remote, keypad track access, volume, hdph, comprehensive display, FTS, custom index, etc	R	70
Sony CDP-337ESD £550	Good Very Good +	Well built, high grade player with excellent if undemonstrative sound. Excellent resolution, dynamics and bass weight, though arguably not control	Random access remote, calendar display, FTS, memory	R	61
Sony 557ESD £1000	Excellent Good +	Superbly built flagship model that produced excellent lab results and very good sound. Many luxury features though not that good value	Full remote, disc directory, digital output, power volume, 8x 0/S, 18 bit		64
Sony CDP-R1/DAS-R1 £5000	Very Good Very Good	Sony has aimed high with the R1 and in some ways has created the reference player. Build quality is amazing and it offers a high level of facilities. One or two faults were revealed in both the lab and the listening, but it's generally excellent	Two box, dual optical connection, digital processor, FTS, remote		72
Stax Quattro £2995	Very Good Very Good	Now in mkII guise this substantial player recreated exceptionally strong and convincing bass lines together with a beguilingly musical midband	18-bit DACs, 20-track memory, full IR remote, variable o/p	R	72
Teac PD135 £180	Fair Fair	Particularly easy to use, this lags a little behind the pack when it comes to sound quality, but it still represents a valid alternative for those who find the presentation attractive.	Skip, scan, programming, repeat.		58
Teac PD470 £250	Fair Good	Pleasant sounding though unexciting, ergonomically functional though predominantly plastic. It doesn't achieve the sonic status required in a hotly contested market segment	Remote, track key pad, autospace, comprehensive display, hdph socket		70
Teac ZD880 £450	Good Fair	Decent enough in most respects with a very good build and finish. Its sound isn't competitive enough to inspire any real enthusiasm	Remote, track key access, auto space, comprehensive display, hdph socket etc		70
Technics SL-P350 £250	Very Good + Good	Nicely built, good features and fine sound, what more do you want for £250?	Remote, digital output, variable hdph output	BB	64
Technics SL-P770 £350	Excellent Good	Sophisticated, high resolution player, but inconsistent with level with some coarseness and compression during loud passages	Remote, 18 bit, rotary cue wheel, comprehensive display	R	61
Technics SL-P990 £450	Excellent Good	An obvious technical tour de force, with ample engineering and build quality to justify the price, but some subjective reservations nonetheless.	Track entry remote, menu display, search dial etc.		58
Technics SL-P1200 £800	Good + + Good	Looking more like a desk workstation than a stackable component, this will appeal to the creative recordist and semi pro user. Sounded pretty good	Headphones, remote control, search dial cueing, etc		51
Toshiba XR-9318 £150	Good Fair +	A basic Philips based player perhaps but just look at the price/performance equation	Remote via system, manual, non oversampled, 16 bit	BB	64
Toshiba XR-9128 £190	Very Good Good	A well equipped Philips clone with a very good performance for the price	Remote, programmable, digital output, hdph	BB	64

CD MIDI SYSTEMS

So you want a hi-fi, but you don't want to make a fuss about it. A pre-packaged system with everything matching up and no aggravation may not rank with carefully chosen separates on **sound quality**, but there's no denying the attractiveness or popularity of this approach – the market for pre-packaged component hi-fi systems is at least as big as that for separate items, even ignoring the vast numbers of low-cost single unit stacker systems. The arrival of compact disc led to a new fashion for shelf-standing compact systems, or 'midis' as

they are known in the trade, as a replacement for earlier floor-standing rack systems (themselves the upmarket development from music centres). Only some 330mm wide, midis can more or less match full-size (430mm) rack components for performance, and are certainly cheaper to make, ship, sell and buy.

Whereas specialist hi-fi is moving steadily towards ultra-simple 'no frills' components, midi systems tend to be sold on a feature count at a price point, usually with little opportunity for

demonstration and comparison. Our test programme includes extensive auditioning and lab testing, while making allowance for the different aspirations of designers and expectations of users. Key features valued highly by customers include system remote control, automatic switching, double 'dubbing' cassette decks, and elaborate equaliser tone controls. And the top end of the market is developing with surround sound audio/video-ready packages.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa X-55 £380	Average Average—	The turntable was slightly better than usual, the cassette deck highly limited, but the dreadful loudspeakers are the clincher	Combined cassette tuner-timer/amp, dedicated T/T speakers, & optional CD		65
Aiwa X-78 £550	Average+ Good	Good. The loudspeakers are disappointing and the turntable is excessively microphonic, but the rest of the system works well.	Auto reverse cassette/tuner/amp & timer, T/T and CD	R	65
Akai M.50CD £550	Poor Poor	Cassette lacks Type II compatibility, general sonics mediocre or less	Devolved from M80 but simplified, part remote		65

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CD MIDI SYSTEMS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai M.80CD £800	Good Good	Good all rounder with minor ergonomic shortcomings but generally practical layout	Separates based, twin auto-reverse cassette	R	65
Goodmans 5300CDM £400	Average— Average+	Crisply styled system with gutsy amplifier and sophisticated speakers. CD player works well, other sources are variously mediocre	Combined cassette/tuner/amp, plus T/T and CD with remote	R	65
Goodmans Maxim-Midi System £520	Average Average+	De-luxe version of 5200 system – very good value for money and readily upgradeable. Sonics rough but OK and speakers good: CD crude	All separates with twin cassette	R	54
JVC Midi-W900CD £1000	Good Good+	A competent allrounder, with important convenience related features, and powerful linked recording facilities. Less strident speakers would be appreciated	Separates system, equaliser, auto-reverse cassette	R	65
Marantz MX583 £750	Below Average Poor	The system has potential in an A/V context, but is patently lacking in a purely audio one. Only the CD excels	Component system with A/V amp, no speakers		65
Marantz MX673CD System £900	Average+ Average	Tremendously flexible audio/visual system. Sound quality is satisfactory at best and ergonomics a mess	Various A/V inputs, remote, speakers optional		54
Philips F777 £850	Good Good	Excellent CD player, tuner and amplifier, offset partly by poor cassette deck and turntable	Separates system, optional remote, no speakers		65
Pioneer System 300 £1000	Very Good Very Good	Sharp, articulate and powerful system that works. The turntable is a weakness as usual, but the only real weakness in an uncommonly sophisticated package.	Remote separates system, optional multi-disc CD	R	65
Proton AI-3000 £550	Good Good	There are a host of minor problems, including no LW, but the unit is attractively packaged and can be made to sound very good despite a woolly sounding amplifier	One piece CD, cassette, tuner and amp, remote	R	65
Sanyo System 22 £350	Average Average+	Some careful detail design has given this system sound quality out of keeping with ordinary appearance. More than the sum of its parts	Single piece, plus speakers	BB	65
Sanyo W40CD £380	Average Average	Low cost, no options package with attractive displays, cassette had high wow and flutter, but the rest worked OK	Semi auto T/T, auto record start, twin cassette	R	54
Sanyo System 33 £400	Average Average+	Similar to the 22, and better when extended, but the price (and value) advantage is dissipated.	As 22, separate T/T, remote	R	65
Sharp SA-CD800H £700	Average Average—	A superficially high grade, high spec system, the SA-CD800H actually sounds clean but a little 'synthetic'	One-piece, 6-disc CD, no T/T		54
Sony Compact 350CD £480	Average— Average—	Visually stunning appearance hides very basic audio attributes, the turntable and cassette deck suffering severe pitch related shortcomings. CD is too expensive in this company	Integrated one piece, (ex CD), 5 disc non-cartridge player		65
Sony Compact 500CD £550	Average+ Average+	Impressive visuals are matched to electronics which in audio terms lack inspiration. The speakers are particularly poor	Combined amp/cassette, 36 preset tuner, T/T component CD		65
Sony Compact 700CD £700	Average+ Good	Loudspeakers and (to a lesser extent) turntable spoil a fine sounding and stylish – if rather costly – package	Separates system, auto reverse cassette, 36 preset tuner		65
Sony Series 1000CD £1500	Very Good Excellent	Very sharp, articulate sounding system from CD and FM. Cassette deck good and flexible, turntable as usual is not in keeping	Separates system, twin auto-reverse cassette, amp with DAC	R	65
Technics X900CD £470	Average Average—	Good build and mostly good sound is offset by mediocre amplifier and loudspeaker and some operational oddities	Main cassette/tuner/amp, separate T/T and CD		65
Technics X950 System £850	Good Good	Fine sound from CD, FM and AM radio and cassette. The record deck is a little better than normal too, but the loudspeakers are disappointing	Component based, CD, twin auto-reverse cassette, tuner, auto T/T, amp and speakers	R	65
Technics X990D System £1250	Good Very Good	Powerful, flexible and well built system – loudspeakers apart. Even the turntable is on the rough side and the loudspeakers should be changed if possible. The rest of the system is AI	Twin deck, programmable T/T, amp, CD, speakers	R	65
Toshiba V17CD £370	Average Average+	Loudspeakers are the weak link, with cassette and turntable also indifferent. Tuner and CD worked well though, so reasonable value for money	Twin cassette, semi-auto T/T	R	54
Toshiba V18CD £400	Poor Poor	Neat and simple to use basic system with good CD but poor elsewhere and abysmal loudspeakers	Integrated amp/cassette deck, other components separate but dedicated		65

TUNERS

The radio medium operates at a much lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live Prom concerts can rival all other sources from a hi-fi perspective. Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for receiving certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen amplifier

cosmetically. However, the task they carry out is far from simple (or cheap), combining the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on local reception conditions, but money invested in a high quality outside aerial system is well spent.

Tuners come in two basic types. Analogue models tune gradually (and usually manually) across

the bands, and can have analogue or digital displays; they are often preferred for sound quality, and are certainly best for AM bands. Digital tuners offer convenient automatic tune facilities and hold many station positions in pre-set memories.

(The Lab and Sound results for models tested in issue No. 65 refer to FM only. For AM results see under Comments.)

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai AT-52L £150	Very Good Very Good	Holds its own on FM against many much more expensive tuners, but AM is very poor	All bands	BB	65
Akai AT-93L £250	Good+ Good+	By AM standards presentable (good) while FM delivers the goods	All bands, aerial switch	R	65
A&R Arcam Alpha £149	Good Average++	Attractively classic British analogue tuner with sound quality comfortably better than most	FM/AM Analogue	BB*	50
A&R Arcam Delta £270	Very Good Very Good	Hi-fi sound on FM, good on AM, a dependable British all-rounder	6AM, 6FM presets. FM/MW. LW display manual tune	BB	55
Denon TU 450L £130	Average+ Average+	Poor AM sound quality may be a deterrent but the FM performance fully merits recommendation	FM/AM Digital MW/LW	R	50
Harman Kardon TU920 £299	Good Average	Rather weak sound quality for the price despite good lab test results	16 presets, AM/FM, digital auto scan, active tracking		55
Harman Kardon Citation 23 £559	Good Very Good	Fine performance, interesting features and ease of use are this tuner's forte, and the sound quality is top notch	FM/AM seek/manual adjustment muting 16 presets remote control	R	60
Hitachi FT-MD 5500 £200	Excellent Good++	A powerful, good sounding tuner with versatile facilities	16 presets, FM, AM, MW auto scan digital signal meter	BB	55
Kenwood KT-660L £130	Fairly Good Fairly Good	You get your money's worth of gadgets and the radio's basically sound although programming is complicated. AM – fairly good	Timer, clock, all bands	R	65
Kenwood KT-1100D £300	Good+ Good+	Behind a gaudy and rather useless display the radio is much better than you might first think. AM – good	Firework display. FM/MW bands only	R	65
Linx Theta £400	Good Very Good	A Magnum Dynalab on the cheap with the hallmark styling of this small British newcomer. Some of the best midrange from any tuner	Manual analogue tuning, no presets, signal strength meter	R	72

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NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Magnum Dynalab FT101 £599	Good Very Good	Although expensive for its fairly minimum set of facilities its excellent sound makes up for what it lacks elsewhere	Analogue manual tuning, no presets, signal strength meter	R	72
Marantz ST35L £125	Good+ Average-	It works well enough but the sound could be better for the money	16 presets, AM/FM, digital auto scan, active tracking		55
Meridian 204 £525	Good+ Good	Pleasant sounding with a fine finish but does not make the grade at this price	FM only, auto scan, digital, remote, clock timer		55
Musical Fidelity T1 £300	Good+ Very Good	Top class FM stereo sound on good signal strengths from this audiophile model. Watch out for local CB!	FM only, analogue box dial, manual tune, signal meter	R	55
NAD 4020B £139	Good Average+	Not the quietest or most sensitive tuner tested, it still provided good sound for the money, being "musical and ambient"	Analogue FM/AM	BB	50
Naim NAT 01 £1098	Very Good Very Good	There may be better sounding tuners in the world, but we have yet to hear one	No presets. Two box, flywheel tuning FM only, Analogue	R	50
Nakamichi ST-7E £750	Good+ + Good+	Exceptionally good for weak-signal areas, and good all round	16 AM/FM presets, Schotz enhanced sensitivity, auto time digital		55
Onkyo T909 £590	Very Good Very Good	It has most of the facilities you could possibly want and more beside. Lab performance and sound quality are both good enough to ensure recommendation even at this price	FM only, digital, 20 presets, auto scan etc.	R	72
Pioneer F551L £100	Good+ Good+	High value budget tuner, very little to argue about (includes long wave)	12 FM, 12 AM presets, auto scan, digital and signal strength meter	BB	55
Pioneer FT 443L £130	Poor Poor	The pretentious 'computer controlled' features don't amount to much. AM - very poor	All bands		65
Pioneer F-737 £230	Good+ Good+	Terrific separation and selectivity on FM, but AM still lacking. AM - fair	FM/MW only	R	65
Pioneer F91 £350	Excellent Good+ +	Easy to use, this model has excellent RF performance and scored very high ratings on the listening tests	FM/AM 24 presets	R	60
Proton AT-300 £199	Good Good	The AT-300 is pretty on the outside, orthodox on the inside and rather dear. AM - poor	FM/MW only	R	65
Quad FM4 £289	Very Good Good+	Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7 presets. Digital	R	50
Revox B260 £918	Excellent Very Good	Sophisticated and expensive, the B260 is ideally suited to the rest of the Revox range and should also work well in other systems	FM - virtually everything	R	60
Rotel RT-830AL £110	Good+ Good	Fine sounding budget audiophile material, no frills, no fuss	Manual dial analogue, FM, MW, LW	BB	55
Rotel RT-850AL £160	Good+ Good+	Scoring well on listening tests and one of the best sounding tuners at its price level, it was a bit let down on AM but RF performance was good	FM/AM, digital	BB	50
SAE T-102 £449	Good+ Good+	Expensive for all the radio you get, but sounds interesting. AM - Poor	FM/MW only	R	65
Sansui TU-D99XL £249	Very Good Good+	This slimline compact model gave good FM sound quality and strong RF performance. But the AM sounded unpleasant	FM/AM, 16 presets	R	50
Sony ST-S300L/ ST-S100L £140/£100	Good Good	A reasonable entry point, not for difficult areas. AM - Poor	All bands	R	65
Sony ST 500ES £200	Good+ + Average-	Disappointing sound quality but good lab performance. (Includes long wave)	10 AM/FM presets, auto scan digital		55
Sony ST-S 700ES £299	Very Good Very Good	First class in every respect including FM sound quality. Even AM was well above average	FM/AM, 10 presets, digital scan	BB	60
Yamaha TX-L400 £130	Good+ + Good+	Good FM sound, let down by poor AM but otherwise good value	16 presets, auto scan, digital, FM, MW, LW	BB	55
Yamaha TX-500 £150	Average+ Average	Under a gaudy coat, this sensitive tuner gave reasonable stereo results. However, the AM had again been thrown down a well	20 presets (10 buttons) digital		50

HEADPHONES

There are a variety of different approaches to headphone design, and examples of each turn up in this group. Amongst the more expensive esoteric models, electrostatic drivers are used in square open-backed phones such as the Jecklin and Stax models. The majority of these come with some form of transformer which takes the signal initially from the speaker terminals on the amplifier. The actual speaker cables then travel from this unit via a

bypass switch to the loudspeakers.

The more down to earth models feature dynamic drivers in circular open-backed designs. The advantage of open backs seems to be a correspondingly open sound and a less claustrophobic feel to the music. One can also of course hear external noises and irritate people on public transport.

The third category are closed-back designs,

which are useful in situations where it is necessary to block out background noise.

Another means of distinguishing different types is the way they sit on your head or ears. There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs press on the outer ear (pinna); and intra-aural types rest inside the ear and are popular amongst users of personal stereos.

NAME PRICE	SOUND COMFORT	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Aiwa HP-X8 £49	Good Very Good	Very slick Walkman oriented phones which are tonally well balanced and go loud without becoming painful	Supra-aural, closed-back, dynamic	R	63
Aiwa HPEX-200 £90	Good Good	Modern looking and well finished the Excelias, as they are dubbed, had meaty bass and sounded reasonably open for the type	Circumaural, closed-back, dynamic		63
AKG K135 £35	Fair Poor	Despite a very appealing design the K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural, semi-open, dynamic		63
AKG K240 Monitor £60	Good Very Good	Something of a classic these AKGs are very user friendly in all respects; sonically on the warm side of neutral	Circumaural, semi-open, dynamic	R	63
AKG K280 Parabolic £110	Very Good Good	A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural, open-backed, dynamic	R	63
Audio Technica ATH 909 £55	Average Average	Quite impressive in the treble though a bit bass shy, the 909s worked well at highish levels	Circumaural, semi-open, dynamic		55
Audio Technica ATH 910 £65	Good Average	The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural, closed-back, dynamic	R	55
Audio Technica ATH-911 £75	Very Good Very Good	Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural, open-backed, dynamic	R	63
Beyer DT 325 £30	Fair Very Good	Lightweight in more ways than one, the 325s may be a little bright for some systems and tastes but will suit duller sources	Supra-aural, open-back, dynamic	R	63

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HEADPHONES

NAME PRICE	SOUND COMFORT	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Beyer DT330 Mk II £45	Poor Good	Not the most revealing 'phones encountered, the 330s were nevertheless enjoyable and rarely offended	Circumaural, semi-open, dynamic		55
Beyer DT550 £69	Good Good	On their own the 550s sound articulate with a slightly 'gritty' treble and 'keen' midrange; not suitable for headbangers!	Circumaural, semi-open, dynamic		55
Beyer DT880 £90	Good Good	Well made cans with a warmish sound but fairly solid midrange, though they're not that informative for the price	Circumaural, semi-open, dynamic		63
Beyer DT990 £119	Very Good Very Good	The 990s are definitely a significant pair of dynamic headphones; they have a smooth and yet revealing, neutral sound that is hard to criticise.	Circumaural, open-back, dynamic	R	55
Jecklin Float Model One £79	Very Good Good	Whilst very unusual in appearance the Floats give remarkable sound quality and openness at a reasonable price	Circumaural-ish, open-back, dynamic	BB	55
Jecklin Float Model Two £99	Very Good Good	Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. Note lack of adjustment means you should try before you buy	Circumaural-ish, open-backed, dynamic	R	63
Jecklin Float Electrostatic £399	Excellent Good	One version of the state-of-the-art, these electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural-ish, open-back, electrostatic	R	55
Koss K/6X Plus £30	Poor Fair	'Sixties-style 'phones from the good ole US of A, their sonic style is unique and can make a system sound quite different	Supra-aural, closed-backed, dynamic		63
Quart Phone 30 £40	Fair Good	Whilst not as seductive as their PMB25 predecessor the 30s are reasonably neutral and do improve on some of the competition - though not stunning	Circumaural, semi-open, dynamic		63
Quart PMB 25II £40	Good Good	Despite a somewhat unconventional suspension system the 25s put in a convincing and enjoyable performance with warm yet lively balance	Circumaural, open-back, dynamic	BB	55
Quart Phone 70 £70	Good Good	Competent performers that were hard to criticise but lacked the life and sparkle of which some of the competition are capable	Circumaural, closed-back, dynamic		63
Quart PMB 65 £70	Good Good	Quite revealing and neutral albeit with the usual closed back sound, this competes well with more established models	Circumaural, closed-back, dynamic	R	55
Quart PMB 85 £90	Very Good Fair	These more expensive Quarts bear a striking resemblance to the Jecklin Float models and use two drivers per ear. Sound is a bit bass heavy but not bad overall	Circumaural, open-backed, dynamic		63
Ross RE-2760 £35	Fair Poor	Stylish white cans from the only British firm in the business. Unfortunately sound quality is not up to par in this price range	Supra-aural, closed-back, dynamic		63
Sennheiser HD30 £13.50	Poor Good	Built specifically for the personal stereo market these small and light Sennheisers have a slightly synthetic sound, but are an upgrade on the average Walkphones	Supra-aural, semi-open back, dynamic		55
Sennheiser HD450 £27	Fair Good	Modern, simple and lightweight phones that are remarkably robust and which turned in a relaxed if weighty performance that was at worst pleasant	Supra-aural, semi-open, dynamic	R	63
Sennheiser HD480 £37	Fair Good	Using the same shell as the 450s, the 480s were a little softened and unrevealing by comparison with their competitors	Supra-aural, semi-open, dynamic		63
Sennheiser HD420SL £47	Good Good	The 420s gave a full and tangible quality to instruments and voices; whilst not the most revealing headphones around they would suit slightly brash sources	Supra-aural, open-back, dynamic		55
Sennheiser HD540 Ref Gold £160	Very Good Good	The 540 Golds prove that dynamic headphones can be subtle, informative and capable of creating a remarkable sense of space	Circumaural, open-back, dynamic	R	55
Sony MDR V3 £30	Good Fair	Portable stereo oriented phones that are very nicely made and combine clarity with a pleasant lack of distortion	Supra-aural, closed-back, dynamic	BB	63
Sony MDR V6 £70	Good Very Good	A lot more civilised and dynamic than the V4s, these were pretty good for their type and fold up to boot	Circumaural, closed-back, dynamic	R	55
Sony MDR V7 £70	Very Good Very Good	Classy sounding cans that are very slick and work well with all types of music, setting the standard in their price range	Circumaural, closed-back, dynamic	R	63
Sony MDR-R10 £2500	Very Good+ Excellent	Costly state of the art sealed moving coil design built to the highest standards using the finest materials. Sound quality reflects this care, being big, clear, sweet and refined	Circumaural, closed-back, dynamic	R	72
Stax SR34 £140	Very Good Fair	The least expensive Stax headphones around, the SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural, open-back, electret		55
Stax SR84 £210	Very Good Very Good	The stepping stone between dynamics and full electrostatics, these electret phones are revealing, open and highly enjoyable	Supra-aural, open-backed, electret	R	63
Stax Gamma pro/SRD-X pro £296/£230	Excellent Very Good	The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural, open-backed, electrostatic	R	63
Stax SR Gamma £299 (inc. SRD-6 Adaptor at £100)	Very Good Very Good	The next model down the Stax range from the Lambda, the Gamma is an excellent headphone with little to criticise but the price.	Circumaural, open-back, electrostatic	R	55
Stax SR Lambda Pro £545 (inc. SRD-7SB Mk 2 Adaptor at £185)	Excellent Very Good	A bit of an industry reference the Pros are frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural, open-back, electrostatic	R	55
Stax Lambda Signature/SRM-TI £470/£895	Excellent Very Good	The Signature when combined with the SRM-TI valve driver must be the most transparent headphone available	Circumaural, open-backed, electrostatic	R	72

PERSONAL STEREO

Whilst not exactly hi-fi components, personal stereos probably play more music to more ears than all manner of domestic systems and as such demand some attention. Now that personal CD players have joined the ubiquitous Walkman in the market, the variety and standard of sound quality is huge, with obscurely named cassette players practically falling out of your cornflakes packet and Discmen going for £300.

Despite their diminutive size personals attempt to incorporate as many gimmicks and features as

possible, cassette players often incorporating tuners, graphic equalisers and Dolby noise reduction. CD players are still relatively expensive and don't tend to vary that much on the features front, rather the amount and quality of accessories differs. Most models come with a mains adaptor and some include remote control.

Sound quality on the cassette front seems to have a proportional relationship to price and integrity of construction - wow and flutter being quite obvious on the cheaper models. CD players

become less noisy as they get dearer and also reduce in size; one drawback of the latter seems to be that immunity to shock suffers as a consequence. Cassette players do, on the whole, seem better suited to the outdoor life than their digital counterparts, as does the software. Bear in mind that the sound and lab ratings given below cannot realistically be compared to those in other categories or between cassette and CD personals.

PERSONAL CASSETTES

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa HS-G35 MkII £30	Poor Fair	A reasonable player for the price but not well suited to classical material and let down by the headphones	Autoreverse, graphic EQ, types I & II		56
Aiwa HS-J36 £89	Good— Average	Comprehensive facilities and reasonable sound are no mean feat for the price.	Dolby, autoreverse, types I, II & IV, AM/FM, recorder	R	56

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PERSONAL CASSETTES

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa HS-PX101 £149	Average— Good	A very slick little number with soft touch controls and remote control headphones	Dolby B, C, autoreverse, types I, II & IV	R	56
Philips D6658 £30	Very Poor Poor	The low price limits sound quality, and this is not a spectacular machine, but it does a reasonable job nonetheless	Graphic EQ, AM/FM		56
Saisho PS90R £40	Poor Poor	A bit of a jumble of features and gadgets, the PS90R has on-board speakers, an extending aerial and even records, but sound quality is dubious	Graphic EQ, types I, II & IV, AM/FM, recorder		56
Sanyo MGR-77 £35	Very Poor Very Poor	Rather a basic machine with a raw edgy sound, not helped by poor speed stability	Graphic EQ, AM/FM		56
Sanyo MGR-87 £50	Very Poor Fair	The 87 came up with a slightly fast but rhythmic sound. Although lacking in finesse, it worked OK with pop material	Autoreverse, graphic EQ, AM/FM		56
Sanyo MGP 600D £50	Average+ Average—	With styling aimed at the fairer sex the 600D sounded a little better than the similarly priced MGR-87. Lacking in clarity, it was still quite durable	Dolby, autoreverse, graphic EQ, types I, II & IV		56
Sanyo JJ-P4 £100	Poor Good	Claimed by its makers to be the world's smallest personal stereo the JJ-P4 is a tasty looking object that's capable of good sounds to boot	Dolby, autoreverse, tape types I, II & IV, rechargeable		56
Sony Walkman Pro £249-£289	Good+ Excellent	One of the finest sounding cassette decks on the market today. A mandatory Best Buy, it takes other personals to the cleaners (except on weight and power consumption)	Dolby B, C, types I, II & IV, record, line BB in/out, varispeed		52/56

PERSONAL CDs

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Goodmans GCD-10 £120	Average— Poor	Cheap, flashy and not short on accessories the GCD-10 is a rather noisy player that left a lot to be desired on the sound quality front	13.5 x 3.7 x 18cm, 478g, mains adaptor		66
Kenwood DPC-77 £270	Good+ Very Good	Very chunky and well made, the DPC-77 is the only player to include a digital output and sounds very good through its analogue output—a suitable domestic alternative	12.8 x 3.5 x 14.5cm, 750g, digital output, mains & in-car adaptors	R	66
Philips D6800 £130	Average Average—	A competitively priced and reasonably attractive looking player whose sonic performance is somewhat marred by a rather grainy top end	13 x 4 x 17.5cm, 516g, 3" ready, twin hdh sockets		66
Sanyo CP-12 £260	Fair Good+	Sonically amongst the more enjoyable personal CD players and capable of revealing the musical aspects of a disc in an interesting and entertaining fashion	12.5 x 2 x 12.7cm, 380g, wired remote, mains adaptor	R	66
Sony D-20 £150	Average+ Fair	Not bad for a machine at this price, it's nicely designed and reasonably robust, with reasonable sound quality	13.8 x 3.8 x 15cm, 450g, mains adaptor	R	66
Sony D-88 £300	Average— Fair+	A stylish and 'cultish' object, the D-88 is very small and has an adjustable disc drive for three and five inch discs. Sound quality doesn't quite match appearance	9.4 x 3 x 9.8cm, 300g, 3" ready, mains adaptor, no line out		66
Sony D-150 £300	Fair+ Very Good	One of the most enjoyable machines encountered, sounding informative and sweet and looking very tasty to boot. Comes complete with a tough carrying case	12.6 x 2.1 x 13.5cm, 420g, 3" ready, R mains adaptor	R	66
Xenon CDP-03 £180	Average— Fair+	A well made and competitively priced machine that is ergonomically spoilt by flat slightly unresponsive buttons. Sound quality ain't too bad but a trifle boring	12.6 x 2.7 x 12.6cm, 560g, high frequency filter, key lock		66

CD PORTABLES

CD Portables or Yuppie Blasters as we classified them are basically portable stereos gone digital, ie a compact disc player is included alongside the usual AM/FM radio and single or double cassette deck. Compact disc is a novelty that seems to add a fairly hefty premium onto the price of the standard ghetto blaster, but the improved sound quality over standard cassettes may justify this for some.

In virtually every case a CD output socket is

fitted which means that it's possible to play silver discs through a domestic amplifier and loudspeakers, thus they are some sort of substitute for standalone mains machines (as are the personal CD players). One drawback with having a CD player on board is that batteries are gobbled up even quicker than usual, up to ten batteries being required in some cases. Neither are the units particularly light, the heaviest weighing eight kilos!

However they do all run off the mains too, and come with an appropriate lead for this purpose. Other useful features common to most are spare input sockets to record from an external line source such as a preamplified vinyl disc signal, and microphone sockets for recording live events (although the usual lack of record level adjustment is a nuisance).

MODEL PRICE	SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa CSD-XL25 £150	Poor	It's cheap, cheerful and not too low on features but sound quality from disc is frankly uninspiring	Twin headphone sockets		This
Bose Acoustic Wave £750	Very Good	No exactly a CD portable as it doesn't play discs, but a highly versatile and stylish radio cassette player that has bass	Input sockets, Dolby NR, PA capable etc	R	This
Grundig RR9000C0 £300	Average	Relatively slick machine with full CD function and volume remote control, low on features for price and unspectacular sounding	Remote, motorised volume pot, condenser mic		This
JVC X510 £200	Average+	A chunky but not too enormous machine which makes reasonable sounds for the price and has something pertaining to low frequencies	Twin decks, graphic eq.	R	This
JVC PC-X300 £350	Average+	Very large machine with removable speakers and radio presets. Goes quite loud but not with a great deal of finesse, guaranteed to impress your mates	Twin decks, aerial connections, graphic eq., etc		This
Philips AZ8394 £200	Average—	Stylish in a wasp like fashion, unfortunately the disc playing lets it down somewhat but otherwise it's OK	Twin decks, graphic eq., bass boost, condenser mic		This
Sharp QT-CD43 £280	Average	Quite a beefy box that comes complete with remote control for volume and CD functions. It even has a surround sound option which enhances imaging	Clock, speaker outputs, powered volume pot		This
Sony CFD-D73 £280	Good	The model we received was intended for the Japanese market and thus may not be entirely representative but it made reasonable sounds and has novel features	UHF bandwidth, input sockets, graphic eq., Megabass	R	This
Sony CFO-DW83 £300	Average	A macho looking beast capable of highish levels, but unimpressive sound for the price. Nice styling and good for scratching	Clock, timer, balance, input sockets, graphic eq.		This
Toshiba RT-8089 £200	Poor+,	Square and long but rather drab on the sound quality front, as well equipped as most but rather tinny in many respects	Clock, twin decks		This
Toshiba XR-9458 £250	Average+	Accompanied by a plethora of accessories including a meaty plinth and infra red remote the Toshiba didn't quite make it on the sound quality front but is worth considering	420g, 2 remotes, mains adaptor, 3" ready etc.		This

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THE DIRECTORY

STANDS AND SUPPORTS

It's becoming more and more apparent that all the components in a hi-fi system benefit from being placed on the right kind of support. It is already acknowledged that performance of electro-mechanical transducers, such as turntables and loudspeakers, can be greatly improved by using highly rigid supports. This notion has been expanded to include electronics such as amplifiers and compact disc players, and inevitably a broad range of stands and supports have been produced to cater for this requirement.

With loudspeaker stands there seems to be two

broad schools of design. The most common is the open frame type which uses square section steel tubing (usually less than an inch square) made up to form a tripod or quadropod stand usually fitted with spikes top and bottom to ensure good coupling to both floor and cabinet. However, for reasons of domestic harmony this latter option is often not pursued as eagerly as perhaps it should be. The alternative approach is to use mass. Larger section (approximately 3 inch x 2 inch) tubing is welded between square top and bottom plates and filled with sand and/or lead shot. Again, this type uses

spikes at the base but Blu-tack or the like for coupling with the speaker cabinet.

Equipment supports generally place isolation quite high on the list of priorities and usually use a lightweight steel frame to support an MDF platform. Once again spikes are used to minimise contact with the platform and ensure good coupling to the floor. Minimising weight without compromising rigidity seems to be the aim with turntable supports but those designed for electronics often employ some form of damping to kill vibration, sometimes in the form of mass.

LOUDSPEAKER STANDS

MODEL PRICE	TYPE FINISH	COMMENTS	TOP PLATE SIZE HEIGHT	VALUE	BACK ISSUE FULL REVIEW
Appolo A82D £40	4 leg Fair	A light open-framed budget design slightly lacking in rigidity and subjectively superceded by other stands costing £10 more.	19 x 19cm 53cm		58
Appolo A10 £47.25	4 leg Fair	A robust and lightweight model, it would make an ideal upgrade for those still happy with the big boxes of old.	19 x 19cm 44cm	R	58
Foundation Fred £65	2 leg Average	With sand filling the Freds made speakers sound tight and coherent with a more even balance.	19 x 19cm 36/43/59cm		58
Foundation Maggi £159	Pair Very Good	Made for Magneplanar and other similar panel speakers they seem to have a healthy effect on the sound quality thereof.	50 x 2cm 2cm	R	58
Foundation Pi £250	2 leg Very Good	Overpriced in material terms the Pi nevertheless has a very positive effect on the low frequency performance of conventional speakers.	20 x 20cm 25/38/46/53cm	R	58
Heybrook Point 5 £50	3 leg Very Good	An unusual triangulated open frame stand that can help certain speakers sound more transparent and fluent - a good value stand.	23 x 21.5cm 47cm	BB	58
Heybrook HBS1 £75	4 leg Very Good	With its new aluminium base frame the HBS1 fared very well in the listening tests. It allowed much of the speakers own 'sound' to remain intact.	23 x 21cm 47cm	R	58
Linn Kan II £79	4 leg Very Good	Built to support Linn's Kan speaker this stand is well suited to the task, but is less successful with other loudspeakers.	19 x 16cm 59cm		58
Linn Sara £85	4 leg Very Good	The Sara exhibits some odd properties so its use other than with the Sara loudspeaker should be viewed with caution.	25 x 21cm 53cm		58
Monotrak Engineering M1 £58	1 leg Good	The M1 gave the mid and treble a commendably smooth and detailed presentation but bass sounded rather lacklustre and muddy.	19 x 18.5cm 48cm		58
Monotrak Engineering M4 £58	4 leg Very Good	Begging comparison with Heybrook's HBS1 the M4 maintained much of the openness and forthright detail of that model.	23 x 21.5cm 53cm	R	58
Monotrak Engineering M4S £58	4 leg Very Good	Its stature and stability would seem to mark it out as most suitable for smaller, lighter cabinets. The M4S possessed an open midband and clear treble.	20 x 17.5cm 53cm		58
Mordaunt-Short IS1 II £45	3 leg Good	Suited to low mass speakers, preferably using spikes to effect coupling, they sounded slightly 'jazzed up' but the overall sound was quite unclouded.	18 x 15cm 56cm	R	58
Origin Live £117	3 leg Good	An unusual tripod stand devoid of top plate and taking up more floor space than normal, subjective and technical performance was exemplary.	(support area) 22 x 17.5cm 52cm	R	58
Partington PP4 £50	1 leg Good	The PP4 offers a rather mixed performance, though when damped with sand infill it was less ready to embellish the overall sound and low frequencies became tauter and quicker.	18 x 16.5cm 48cm		58
Partington Dreadnought II £120 (filled)	1 leg Very Good	Ideal for systems on the light/bright side of neutral, the Dreadnought IIs nevertheless still need some careful re-examination by Partington.	17.5 x 16.5cm 63cm		58
QED TS22 Tristand £50	3 leg Very Good	Most tracks sounded uplifted or buoyant, never thick nor coloured. It worked well with most of the speakers tried and encouraged a fluid and revealing midband.	19 x 17cm 45/50/58cm	BB	58
RATA Torlyte £190	2 panel Excellent	Suited to low mass speakers, these unusual stands are hardly discreet but offer transparent and clean sound - much like the Torlyte table!	25 x 21cm 48cm	R	58
Target HS20 £53	1 leg Excellent	This monopod stand can be used either filled or unfilled and encourages different characteristics in the sound accordingly.	19 x 16.5cm 53cm		58
Target HJ15/3 £83	3 leg Very Good	Sound quality was basically very good though without the sand infill some loudspeakers may sound a little unbalanced as both bass and treble regions are subjectively exaggerated.	28 x 28cm 40cm	R	58

EQUIPMENT SUPPORTS

MODEL PRICE	TYPE FINISH	COMMENTS	SIZE (H x W x D)	VALUE	BACK ISSUE FULL REVIEW
Audioquest Sorbothane Feet £10 each	Feet Good	These large gumdrops are very useful for damping vibrations in amplifiers and especially CD players.	6.5 x 2.5cm (circular)	R	57
Cornflake TCSS £50	Table Very Good	A little too close to the ground for comfort, perhaps, but this novel and stylish little table is certainly worth seeking out.	29 x 43 x 33cm	R	57
Cornflake TCSS6 £50	Shelf Good	A squat and rigid frame supports a Medite top board with four adjustable spikes, better suited to suspended sub-chassis turntables.	43 x 23 x 33cm		57
Deltec Isolation Base £135	Platform Good	Designed for all CD players, amplifiers and separates, but not suspended sub-chassis turntables, the isolation is second to none.	50.5 x 40cm	R	57
RATA Model A £125	Table Very Good	A three-legged Torlyte turntable support that has become something of an industry reference.	46 x 46.5 x 38.5cm	R	57
RATA Amplat £40.25	Platform Very Good	A lightweight and rigid Torlyte slat with spikes for floor or shelf mounting, it works well in conjunction with the Target TT2.	4 x 44.5 x 35cm		57
Sound Organisation Table £55	Table Very Good	A deceptively simple structure that just happens to be engineered in a thoughtful, and ultimately successful manner.	37 x 45 x 35cm	BB	57
Sound Organisation Wall Stand £40	Shelf Very Good	The first of its ilk and still amongst the best, this simple framework represents a vast improvement over standard furniture shelves.	27.5 x 43 x 35cm	BB	57
Target TT1 £46.50	Shelf Excellent	This rigidly braced shelf offers both good sound quality and material value for money.	26 x 46.5 x 35.5cm	BB	57
Target TT2 £47.50	Table Very Good	Standing up to the best in most areas, the TT2's only real foible concerns a slight loss of bass 'slam'.	52 x 46.5 x 35.5cm	BB	57
Townshend Suspension Base £145	Platform Fair	Designed to complement the Rock turntable, this platform will bring subjective improvement to a wide range of electronics.	43 x 36cm	R	57

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THE DIRECTORY

CABLES AND CONNECTIONS

Although cables and connections are sometimes thought to be the least important items in an audio system there has been a growing awareness in recent years that they have a significant effect on sound quality. To this end there is now a vast array of exotic cables and interconnects available to those interested in experimentation. The key observation on cables is that they are much more than mere accessories. Carrying the audio signal, just as any amplifier does, it's really not too surprising that they can influence the quality of that

signal.

The characteristics of any cable are determined by the materials and topologies utilised in its construction. The purity of the conductor, nature of the insulator dielectric, mechanical construction, physical geometry, RF characteristics, efficiency of screening and finally the connectors themselves, all play vital roles in the sonic character. These factors tend to vary more with interconnect cables which are used to carry the signal between active components like pre and power amplifiers. The

interconnects summarised here were tested in 1m terminated lengths and therefore the results and prices relate to that length – some cables may well perform differently when used in longer lengths.

The features column contains information on the material make-up of the different cables with the following abbreviations: OFC – oxygen free copper, OFHC – oxygen free high conductivity (Audionote define the HC as high crystal), PC-OCC – pure copper by ohno continuous casting, LC-OFC – linear crystal oxygen free copper.

INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Apature LSD N/A in UK	Poor Fair	Faint resonant boom was audible at very low frequencies, but otherwise this cable sounded remarkably neutral.	Silver plated copper, PTFE dielectric		59
Audioquest Reference 2 £29	Good Fair	Ultimately Reference 2 simply damped much of the atmosphere and emotional charge of a musical performance.	OFC copper		59
Audioquest Livewire Topaz £29	Good Fair	Sounding 'bigger' and faintly richer than Reference 2, Topaz was also slightly grainy at the top end.	Gold-plated plugs, OFHC copper		59
Audioquest Livewire Ruby £45	Fair Good	Smoother sounding than the Topaz, the extended crystal Ruby is less grainy and coarse, better able to resolve complex passages.	FCL copper twin axial	R	59
Audioquest Livewire Quartz £65	Good Good	Quartz has an ideal, neutral balance that embodies sparkling clarity without the drawbacks of harshness or compression.	3 piece plugs, PTFE dielectric	R	59
Audio Technica AT6115 £50	Very Good Fair	This cable sounds somewhat 'quieter' than the original LC-OFC interconnect, but is also less transparent and three dimensional.	PC-OCC copper coaxial		59
Audionote Copper ANC £35	Fair Good	ANC sounded punchy with a faintly lean but tightly-focused bass character. This crystalline precision waned slightly at higher frequencies.	OFHC copper twin-axial	R	59
Audionote Flexible Silver ANS £85	Fair Good	ANS scored a hit with its transparent midband and revealing but quite unforced treble quality. Bass transients were slightly softened.	Silver signal & Copper screen	R	59
Audionote Silver ANV £140	Poor Fair	Far weightier-sounding than the flexible ANS, ANV interconnect also possesses a fair degree of treble clarity and sparkle.	21 strand silver Litz		59
Aural Symphonics N/A in UK	Poor Good	This cable enjoyed an open and transparent midband and sounded remarkably neutral and faithful to the source.	OFC copper PTFE dielectric	R	59
Budget Patch Cords see text	Fair Poor	As thrown in gratis with cassette decks and the like – frequency extremes were restricted and performances were veiled.	Thin coaxial		59
Budget OFC circa £7	Fair Fair	Subjectively, this cable did lift much of the aural fog experienced with scrawny standard hook-up leads.	OFC		59
Deltec Slink £32	Good Very Good	Ideally used in lengths of under 4 metres, it errs on the lean side of neutral but has an uncommon transparency in the midrange.	4 silver plated OFC strands PTFE dielectric	BB	59
Deltec Black Slink £152	Excellent Excellent	Inherently neutral the cable faithfully reproduced broad and deep stereo soundstages with precise focus and a sense of facility.	8 silver plated OFC strands PTFE dielectric	R	59
Denon LC-OFC N/A separately	Very Good Fair	Supplied with Denon's dearer CD players this cable introduced a peculiar 'twangy' coloration at high frequencies, and a slightly soft bass.	LC-OFC, non-magnetic gold plated plugs		59
DNM Solid-core £15-£25	Fair Good	Transparent in the midband and full of sparkling detail in the treble, low bass was slightly curtailed (unterminated price £2.30 per m.)	Single strand nickel-plated copper. Unshielded	R	59
Kimber Kable PSB £32	Very Good Very Good	An exceedingly transparent midband but slightly 'clanky' treble. It always managed to sound remarkably uncluttered and open.	OFC, PTFE dielectric	BB	59
Kimber Kable KC-1 £47	Very Good Fair	Tonally faintly leaner and brighter than the more open-weave PSB, KC-1's treble detail was just too sharp and grainy.	Multi-gauge PTFE dielectric		59
Kimber Kable KC-AG £375	Good Very Good	Treble detail resolution was perceived in a slightly abrupt if wholly controlled fashion. Depth re-creation and lateral separation were excellent.	Multi-gauge silver, PTFE dielectric	R	59
MDM Interconnect £14.95	Good Fair	The subjective performance of MDM did appear a little imprecise at the frequency extremes, but a worthwhile upgrade on budget interconnect.	Coaxial, solid core, gold plated plugs		59
MIT PC-Squared £75	Fair Good	This multi-gauge cable produced a very open and buoyant midband but sounded slightly 'peculiar' at frequency extremes.	OFC, multi-gauge	R	59
MIT Spectral MI330 £193	Poor Fair	MI330 displays a marvellously open and enticing midband quality, bass is warm and rich but this character has a tendency to dominate.	Multi-gauge balanced bandwidth		59
Monitor PC 0100381 £17	Good Fair	There is more than a hint of instrumental mudding and bass is slightly soft, however, the slightly 'shut-in' sound is par for the course at the price.	OFC, coaxial	R	59
Monster Interlink 400 £30	Good Good	Bass is solid and punchy, counterpointed by a slightly overblown midband which tends to make vocalists sound larger-than-life.	Multi-gauge	R	59
Monster Interlink CO £44	Fair Fair	Low frequency is commendably weighty, but the top-end sounds vague and lacking in image focus. Suited to some systems better than others.	Multi-gauge		59
Monster Interlink Reference £88	Good Fair	Protracted listening indicated a lack of dynamic speed – a subjective sluggishness. It may prove well suited to up-front systems.	Multi-gauge Balanced bandwidth Gold plated plugs		59
Myst Tm £15.60	Fair Good	Fairly neutral with a pleasantly open and transparent midband. Some deep bass detail is lost but treble is sharply focused.	Solid-silver PTFE dielectric	BB	59
Origin Live Soli-Core Super £60	Good Fair	Improves over previous Soli-core samples in stereo depth and bass weight, but a 'loud' treble presentation remains.	Solid-core gold-plated AT plugs		59
QED Incon P1-Gold £14.95	Good Good	A lively open presentation that just borders on the lean side of neutral, the quick and lucid delivery affording considerable musical insight.	OFHC, gold plated Deltron plugs	BB	59
QED Incon Graphite GP1 Gold £18.95	Fair Fair	A shielded version of Incon P1, it sounded thicker at the frequency extremes, the top end being coarser and more out of focus. Good for long runs though.	OFHC Graphite shielding	R	59
Sony RK-C310ES £40	Excellent Good	Possessing deep firm bass and a sparkling top end it offers a balanced perspective with negligible coloration.	Coaxial LC-OFC	R	59
Sterling £250	Fair Good	Possessing a neutral if faintly rich overall balance it supplies a pleasantly open and transparent perspective. (Reviewed in pre-production form.)	2 silver strands per conductor		59
Thorens SAC 100 £50	Good Fair	Performance is undermined by a slightly coarse and splashy treble, not necessarily bright, simply rather confused – and fine detail lacks resolution.	Silver-plated OFC, coaxial		59
Van den Hul MC-D300II £59	Poor Good	It tended to highlight some upper mid detail, but a generally open and spacious acoustic proved its saving grace. Slightly soft at LF.	Silver plated single strand VdH plugs	R	59
Van den Hul MC-1021II £69	Good Good	Possessing the same endearing qualities as the D300 it presented open and transparent soundstages and improved timbral resolution.	Twin axial silver plated copper	R	59

THE DIRECTORY

INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Van den Hul MC-D502 £77	Fair Fair	The tonal balance was 'tited' by a strong and authoritative bass line, which had the knock-on effect of muting treble detail. A bit dear.	Twinn axial silver plated copper, tetlon dielectric		59
Van den Hul Thunderline £147	Good Fair	Thunderline essentially parallels the sonic performance of the cheaper D102. HF is occasionally tainted by a 'tizzy' 'coarseness', bass is tight and dry.	Silver plated 'matched copper'		59
Van den Hul MC-Gold £247	Fair Good	It possesses a rich and beguiling treble balance that matches a weighty, slightly warm bass character. Seductive balance may prove worthwhile in some circumstances.	Silver & gold plated copper		59
Van den Hul MC-Silver £747	Good Good	Although remarkably transparent for an asymmetric design this costly cable was not considered to be of 'state-of-the-art' standard, and is bettered by cheaper models.	19 silver plated copper strands		59
Vecteur 8045 £49	Very Good Good	Sounding solid and forthright it might seem slightly cold in some systems but the treble 'edge' is mercifully clean. Very low frequencies were a little lacking in 'slam'.	LC-0FC signal & screen	R	59

LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Absolute Wire Force 4 £4.50 per metre	Good Fair+	By current standards there was a loss of fine, sharp detail at the frequency extremes, but it has a big and friendly sound	744 OFC strands, PVC dielectric		64
Audionote OR-200 £16 per metre	Fair+ Fair+	Open and detailed throughout the midband but a grainy coloration tended to corrupt subtle timbral information at very high frequencies	200 LC strands, polyurethane and cotton dielectric		64
Audionote AN-SP £100 per metre	Average— Good	A clean and open sounding cable that offered a deep and pleasantly detailed perspective. Bass was slightly restricted, but seemed tight and coherent nonetheless	15 silver strands, polyethylene dielectric		64
Audioquest BC-4 £2 per metre	Average+ Good+	There was a slowing of fast transient edges to contend with but in general BC-4 offered a delightful clarity and sparkle throughout the highest octaves	4 OFHC strands, PVC dielectric	BB	64
Audioquest Livewire Black £15 per metre	Good Good	It proved clear and punchy but with some grain across the treble. Nevertheless Black remains an interesting concept and proved better than Livewire Green	OFHC, surface only - foam core construction	R	64
Audioquest Livewire Green £30 per metre	Good Fair+	Green proved more overtly dynamic and forward than BC-4 with simple music, but complex passages tended towards a mushy and ill-defined perspective. FCL - functionally crystal less	FCL, surface only - foam core construction		64
Audio Technica AT6120 £95 - 10m	Fair+ Fair	Compared to earlier LC-0FC cables this PC-OCC derivative sounded smoother and less aggressive	PC-OCC, PVC dielectric		64
Bellwire 12p per metre	Poor Average—	Broadly speaking it delivered a bright and tizzy sounding treble with a fairly open and detailed mid with little or no bass resolution	0.5mm single strand, PVC dielectric		64
Deltec 8S £144 - 5m pair	Good Good+	The unerring transparency and detail resolution of 8S throughout the midband makes it a far cleaner and more spacious sounding cable than others at the price	4 silver plated OF copper strands, PTFE	R	64
Deltec Black Sixteen £456 - 4.5m pair	Very Good Excellent	Bass was deep and rhythmically secure, the mid tonally pure and free of additional sibilance while the treble was both relaxed, sweet and highly detailed	16 silver plated OF copper strands, PTFE dielectric	R	64
DNM Solid core £2.30 per metre	Average Fair	DNM cable seems too unbalanced for general consumption but excellent results have been obtained in sympathetic systems	0.65mm single strand, webbed PVC dielectric	R	64
Exposure £2 per metre	Good Good	It could sound a trifle matter of fact but this emotive flattening was also somewhat dependent on the music program. It is also highly suited to long runs	56 OFC strands, webbed PVC dielectric	R	64
Kimber Kable 4PR £49.45 - 5m pair	Fair Fair+	This directionally marked cable benefitted from an open and airy treble quality but seemed notably leaner than 4TC. Bass was well round and satisfyingly taut	4 x 7 copper strands per conductor, PVC dielectric		64
Kimber Kable 4TC £16 per metre	Good Good+	4TC made a great impression in the listening tests with an open midband, a smooth and un-fatiguing treble with slightly rich but suitably weighty bass	OF copper, PTFE dielectric	R	64
Linn K20 £2.20 per metre	Good Fair	Subjectively it erred on the forward and bright side of neutral but enjoyed an essentially clear and punchy delivery	56 OFC strands, webbed PVC dielectric		64
Marantz ML-55S £24.90 - 10m	Fair Fair	Subjectively this cable offered a loose and splashy treble which, though not overtly bright, did compromise both tonal and timbral accuracy	30 OFC strands, 3 conductors PVC dielectric		64
Mission Cyrus £2.50 per metre	Average+ Good	Because of its impedance characteristic this cable will deliver a smooth and un-fatiguing treble balance with loudspeakers offering an easy load	0.8mm single strand, PVC dielectric	BB	64
Monitor PC Silverline PC4 £5.75 per metre	Good Average	Sonically it laboured under a heavy and claustrophobic balance, lacking the see through transparency and lucidity of the better solid core cables	2072 x 0.07mm silver plated copper strands		64
Monster Superflex £2.50 per metre	Fair+ Fair+	Treble detail was both reserved and confused though there was little in the way of harshness and grain. Deep bass notes were also found to be lacking	OFC, multistrand, Duraflex dielectric		64
Monster Original £4 per metre	Good Fair+	Original sounded relatively congested and murky at higher frequencies but possessed weight and conviction in the bass	Multistrand		64
Monster Powerline 2 £12 per metre	Good Good—	Powerline stamped its own hallmark on the sound with a strong taut bass and an essentially clear midband giving tactile stereo images	Multistrand, helical construction		64
Musical Fidelity Lifeline £11.50 per metre	Fair Good—	Lifeline did demonstrate a strong directional inclination, affording a laid back but fairly neutral balance when correctly oriented	4 x 0.8mm PC-OCC strands	R	64
Naim NAC-A4 £2.25 per metre	Good Fair+	Tinged with brightness while the deep bass response seemed both over heavy and poorly integrated compared to the immediate competition	Multistrand, webbed PVC dielectric		64
NVA £6 per metre	Average+ Good	A light and breezy sounding cable best suited to short lengths, NVA benefitted from a clear and transparent outlook	7 x 0.25mm silver alloy strands, PTFE	R	64
Origin Live Soli-Core Ordinary £1.80 per metre	Good Fair+	Subjectively it bettered the performance of the costlier Super version, affording a pleasantly detailed and spacious soundstage with firm bass but slightly coarse treble	1.8mm and 0.5mm single strands	R	64
QED 79-Strand 90p per metre	Good Fair	For much of the last decade QED 79-Strand has been the first port of call for enthusiasts on the upgrading ladder, a tradition that should still hold true today	79 strand, PVC dielectric	R	64
QED Incon Graphite £1.75 per metre	Fair+ Fair+	This graphite version of Incon sounded cruder and generally more heavy handed than the cheaper unshielded type. Overall presentation was mildly restricted and cloaked in a faint aural fog	OFHC, polymeric screen		64
QED Flat 200 £1.95 per metre	Good Good	I detected a degree of confusion at low frequencies but this did not stifle the acoustic atmosphere which remained open and positive	200 strands, flat webbed PVC dielectric	R	64
Rotel Supra 4 £2.49 per metre	Good+ Good	Ideal for both long and short runs, it furnishes a big sound that benefits further from a smooth, un-fatiguing treble	1,036 OFC strands, webbed PVC dielectric	R	64
Rotel Supra 10 £6.49 per metre	Good+ Good	Supra 10 provided a very free and open sound that was unhindered by any excess at low frequencies. Worth its weight in scrap copper!	2,562 OFC strands, webbed PVC dielectric	R	64
Sony RK-S5ES £59.95 - 5m	Fair+ Fair+	The sound of this cable was also somewhat controlled and over damped. The treble was relatively free and airy but lower octaves, including the midband, were constrained	350 x 0.08mm OFC strands, heat shrink dielectric		64
Solid core mains cable 36p per metre	Fair+ Good	It enjoys much of the smooth treble and articulate midrange usually associated with the better solid core derivatives. Lean but taut and rhythmically coherent	1.5mm square, 3 cores, PVC dielectric	BB	64

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Sterling £499 - 5m pair	Fair Fair	This pre-production sample possessed a strangely muddled and reserved sound quality. It suffered from a progressive instrument modulation that totally confused more complex orchestral passages	Pure Silver, PTFE dielectric		64
Townshend Isolda £400 - 5m pair	Fair+ Good	Isolda possessed a truly dark background out of which rose a very solid and extended bass together with an excellent sense of transparency through the upper octaves	8 coax cables per conductor - very thick	R	64
van den Hul CS-122 £5.50 per metre	Fair+ Good-	Characterised by a driving and powerful bass, CS-122 proved to be a heavy sounding cable. Mid treble detail was refreshingly clear but there was a slightly muted air about the extreme treble	19 x 0.45mm silver plated strands, webbed rubberised dielectric	R	64
van den Hul CS-352 £12.95 per metre	Good Fair+	Subjectively it sounded like CS-122 only more so, the deep rumbling bass tending to overwhelm subtle musical details. It also appeared a trifle peaky in the treble	7 x 0.76mm + 168 x 0.125mm silver plated strands, rubberised dielectric		64
van den Hul SCS-12 £29.95 per linear metre	Good+ Good+	SCS-12 set a high standard with a tight and well focused soundstage populated with tactile stereo images. Bass wasn't as extended or resolved as some other cables	19 silver plated strands of 12 different gauges, PTFE dielectric	R	64
van den Hul SCS-2 £99.95 per linear metre	Good+ Good+	Overall it was commendably neutral and transparent but nothing less would be acceptable bearing in mind the tremendous cost of a stereo pair	665 silver plated matched crystal copper strands, PTFE dielectric	R	64
Vecteur R-CV30 £4.99 per metre	Fair Good	Subjectively the better of Vecteur's three-strong cable line-up offering a neutral overall perspective but with a slight loss of detail resolution at both frequency extremes	4 x 0.8mm LC-OFC PTFE insulated strands	BB	64
Vecteur S-CV90 £1.99 - 5m pair	Fair+ Fair+	It seemed both less transparent and integrated throughout the midband than R-CV30, though both frequency extremes were spruced up with a tighter sharper delivery	6 x 0.7mm LC-OFC strands		64

IN-CAR ENTERTAINMENT

In-car entertainment is an area not usually associated with the esoteric world of domestic hi-fi. However, it represents a source of musical entertainment that many of us are exposed to every day. The majority of new cars are fitted with some form of radio before they leave the showroom and in many cases this usually very basic player is taken for granted and accepted as representative of in-car audio standards.

For the price of a budget amplifier or more, there is a wide variety of in-car machines to choose from,

including cassette, CD and even DAT players. The majority of sub £300 players are integrated units featuring a cassette player, AM/FM tuner and amplifier, all in one remarkably compact standard sized box. At this price level the cassette players tend to be fairly basic affairs, although autoreverse and noise reduction systems are both fairly common. Tuners are usually of the digital variety with varying degrees of sophistication in signal tuning and presetting, with some machines featuring as many as 18 FM presets. The emphasis is on the frequency

modulated band and AM often suffers as a consequence, but fortunately for radio enthusiasts there are some exceptions.

The amplifier is usually designed to drive two pairs of speakers mounted fore and aft of the vehicle, and a fader is fitted to adjust the balance between the two. The dearer machines feature separate bass and treble controls which can be quite handy given the unusual acoustic of the car environment and the variety in balance and presentation to be had from car speakers.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Alpine 7282L £250	Good Very Good	A very attractive and seductive sounding player. The matt surfaced transparent preset keys are especially sexy	Bass/treble controls, 12 FM 6 AM presets, chrome eq., clock, 8W	R	61
Alpine 7905M/3539 £650/£350	Excellent Excellent	An easy to use and attractive CD/tuner, partnered with a powerful and flexible amplifier to give an effortless source of in-car entertainment	Bass/treble controls, 12 FM, 12 AM presets, slide-out, 150W	R	68
Aiwa CT-Z3500YL £199	Fair Fair	A nicely designed machine with a flip up lid for disguise purposes. Sound quality from cassette is a bit poor but the radio is exemplary especially on AM	Bass/Treble controls, 6 FM, 12 AM presets, Dolby, chrome eq., 8.4W	R	62
Blaupunkt Paris SQM 48 £253	Average Average	A powerful and sensibly designed player but let down by a very dull sounding cassette. The radio is a bit better	Bass/treble controls, 5 FM, 10 AM presets, uni-directional, 11.5W		62
Blaupunkt Windsor SQR 38 £275	Good Average	Not very enthralling sonically, the Windsor is rather low powered but does have a reasonably stable tape transport	5 FM, 10 AM presets, 3.1W		62
Clarion 916HP £160	Good Average	With its rubbery buttons and touches of white this is a modest looking player let down by a weak cassette	Bass/treble controls, 5 FM, 5 AM presets, 9W		61
Clarion 946HP £250	Very Good Very Good	A good FM side let down slightly by AM performance. This Clarion is particularly nice to use with its nifty SAM tuning system	Bass/treble controls, 12 FM/6 AM presets, slot-in, 15.1W	R	61
Clarion CDC7000/10028HA £650/£250	Very Good Excellent	Despite a slightly off-beat cartridge system the Clarion combo put in a performance that had the sonic edge over other CD/tuners in its test group	Bass/treble controls, 12 FM, 12 AM presets, security code, 80W	R	68
Goodmans GCE229 £150	Fair Average	If knobs, switches and legends are your bag then the GCE229 is the one for you - a lot of gizmos for the price and it even sounds OK	Bass/treble controls, 6 FM/6 AM presets, Chrome eq., clock, MSS, 10.1W	BB	61
Hitachi CSK-402E £250	Good Good	An attractively designed little player that for once doesn't disappoint when it comes to playing music, and it even has a security system	Bass/treble controls, 6 FM, 12 AM presets, Dolby, chrome eq., music search, 7.4W	R	62
JVC RX-318 £200	Average Average	This JVC sounded quite enjoyable and turned in an impressive performance on FM. It even looks quite nice	Bass/treble controls, 5 FM, 10 AM presets, slot-in, 8.8W	R	62
JVC RX-418 £250	Average Fair	An attractively designed machine with a fair selection of features - even an aux socket for a portable CD player	Bass/treble controls, 10 FM, 10 AM presets, Dolby, chrome eq., slot-in, aux socket, 7.7W		62
JVC XL-C30E/KS-A102 £499/£130	Very Good Very Good	Not sonically as impressive as the other CD cartridge players in its group, the C30/A102 combo is, however, a versatile and fast sounding player	Bass/treble controls, 10 FM, 10 AM presets, direct track access, 30W		68
JVC KS-D1 £1000	n/a Excellent	The only in-car DAT player we've tested proved musically quite impressive and if software ever becomes prolific it will be able to offer CD a run for its money	Bass/treble controls, no tuner, direct track access	R	68
Nakamichi TD-400E/PA-300 II £450/£275	Very Good Excellent	If you want your in-car entertainment to compete on sound quality grounds with your domestic system, this combo offers a very strong challenge	Bass/treble controls, 5 FM, 10 AM presets, uni-directional, chrome eq., Dolby B, C, 75W	R	62
Nakamichi TD-700E/PA-300II £795/£299	Very Good Excellent	For those who appreciate the wonders of analogue there are few in-car players to really compete with this superb cassette/radio. You can even adjust azimuth	Bass/treble controls, 6 FM, 6 AM presets, music search, Dolby, 75W	R	68
Panasonic CQ-497 £117	Fair Poor	The CQ-497 has a traditional style analogue tuning system making it easy to use. AM reception was good but the other sources are less encouraging	Bass/treble controls, chrome, NR, 7W		62
Philips 553 £120	Average Average	Not the most ergonomic player on test but sound quality was quite refined for the price. Presets are a bit gauche	4 FM, 4 AM presets uni-direction cassette 3.1W		61
Philips DC680 £180	Average Good	A colourful and musically competent player that despite a gammy volume knob is well worth checking out.	8 FM, 4 AM presets 3.5W	R	61
Pioneer KE-3030 £150	Poor Fair	A tasty looking, if sonically bass heavy, little box well suited to blasting out rock or dub	18 FM, 6 AM presets 4.2W		61
Pioneer KEH-5080B £230	Fair Good	A chunky and neatly styled player with healthy power output and an easy relaxed sound. Just the thing for pumping up the volume	Bass/treble controls, 18 FM, 6 AM presets, anti-theft device, slot-in. 9W	R	61

THE DIRECTORY

IN-CAR ENTERTAINMENT

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Pioneer DEX-M300/CDX-M100/ GM-3000 £300/£450/£280	n/a Very Good	Separate control unit and boot mounted multi play autochanger make this a bit of a hefty installation but it uses the same magazines as their domestic players and sounds fine	Bass/treble controls, 18 FM, 6 AM presets, 80W, removable fascia		68
Proton 214CD/D275 £300/£175	Very Good Very Good	This Proton cassette/tuner offers good power and a level of fidelity appropriate to its price. Musically it has a Decca-like charm that is very appealing, plus a sensitive radio	Bass/treble controls, 8 FM, 8 AM presets, Dolby B/C NR, chrome eq., 85W	R	68
Sansui RX-3100L £180	Poor Fair	Quite flash looking with a reasonable feature count but FM sound and cassette replay quality could be a bit stronger at the price	Bass/treble controls, 12 FM, 12 AM presets, chrome eq., 8W		61
Sansui RX-5100L £250	Good Very Good	One of the cleaner machines around the 5100 has an excellent AM section and a reasonable cassette player	Bass/treble controls, 12 FM, 6 AM presets, chrome eq., slot-in, 12.5W	R	61
Sharp RG-F816E £200	Poor Average	Nothing if not novel the 816, with its unusual anti-theft system is custom built for the furry dice brigade, but is sonically a bit lacklustre	Four band graphic, 8 FM, 16 AM presets, ASP, Dolby, MSS, 10.9W		62
Sharp RG-F882E £220	Average Average	Again a glitzy full feature machine with a flip out control panel and plenty of lights. However, sound quality is a bit disappointing	Seven band graphic, 5 FM, 10 AM presets, ASP, chrome eq., Dolby, 8.5W		62

RECEIVERS

Purists will look down their noses at the very idea of combining two functions into one box, and indeed they always have done. But unless we're talking about the exotic elite, the creme de la creme of amplifier and tuner, intrinsic technical shortcomings simply aren't an issue.

One obvious reason why you should buy a receiver if you were otherwise considering an amplifier and a tuner is that there are savings, ie of

size. Generally you end up with one box in place of two similarly sized boxes, which has got to be a good idea. Receivers are also simpler to operate, in principle anyway. At the very least you save on one power switch, and typically you are presented with an integrated control system that is bound to oil the wheels of ergonomics.

But there is one important point to watch. Because receivers don't sell in vast quantities in

this country, and because this is one of the very few countries to use Long Wave for public service broadcasting, many – no, most – receivers on sale in this country cover FM and MW only. Remember that LW is the home of Radio 4, where it can be heard on the all too frequent occasions it is not on FM.

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Harman Kardon HK330Vi £259	Average Average—	No LW, and FM section best suited to strong, local transmissions. The amplifier is quite powerful but favours the treble. Bass is tuneful but lacks weight	5 inputs (inc 2 tape), FM/MW tuner		70
Harman Kardon HK440Vxi £329	Good Good	Clear, dynamic, slightly bright sounding design, a little grainy in extremis. Mono switching and LW missing from tuner, which otherwise performs well	5 inputs (including 2 tape) with FM/MW tuner	R	70
JVC RX-777VL £500	Good Good	Sharp, lively but euphonious sound quality from line and phono source is matched to a high grade tuner. However, many half-baked facilities blunt value for money	A/V capable with 6 inputs, equaliser, digital ambience, FM, MW/LW		70
JVC RX-1001V £770	Average Poor	Power output is well below spec, and sound quality is cluttered and messy on all inputs	Digital ambience processing, Dolby Surround, 2/4 speaker, 40 FM/MW presets		70
Revox B285 £1782	Average Average—	Sophisticated and capable tuner is married to a muddled, compressed sounding amplifier, which also has low sensitivity preventing the amplifier being driven fully in many situations	70 watts/ch, 4 inputs (inc 2 tape), 29 FM/MW/LW presets		70
Rotel RX-850AL £230	Good Good	Well built and sensibly equipped receiver with outstanding sound quality for the price via the tuner, phono and line sources alike. It majors on subtlety however, and may not impress the heavy metal brigade	4 inputs (inc 1 tape), FM/MW/LW tuner BB		70
SAE R102 £599	Average— Average	This is an uneven but mostly good performer. It sounds constrained but musical, but the tuner is weak on both wavebands.	4 inputs (inc 2 tape), FM/MW tuner		70

VIDEO RECORDERS

For some time there's been a move to improve both the video and the audio quality of video recorders and TV sets alike as a necessary prelude to a proper integration between the two. Hi-fi video is obviously an important element in the story, and so is Dolby Stereo, the ambient 'surround sound'

system. The weak link of course is on the broadcast side. Although TV sound is well up to normal hi-fi standards, it has always been in mono and unjustly or otherwise has rarely attracted much audiophile interest. But TV sound is – or shortly will be – freed of the shackles of mono by the introduction of NICAM

stereo. NICAM – an acronym for Near Instantaneous Companding and Modulating – is the missing link that will help facilitate the much feted integration of video with audio. And then we have S-VHS, a system which does for picture quality what the other developments promise to do for the sound . . .

NAME PRICE	LAB SOUND & PICTURE	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai VS-75EK £550	Average Good	Excellent performance and a slick set of controls make this recorder a pleasure to use. Good price is a bonus	Hi-fi, NICAM, programmable remote	BB	71
Akai VS-77EK £700	Average Good	Another fine and carefully designed model from the impressive Akai video stable. The Dolby installation, whilst flawed, is certain to increase interest in the system	Hi-fi, NICAM, Dolby Surround decoder & stereo amp	R	71
Ferguson FV33H £500	Very Good Below Average	Beer budget NICAM has excellent tape search facilities and an intelligent remote control. Neither picture nor sound quality however are state of the art, and ergonomics are poor	Hi-fi, NICAM, transmitter LCD remote control		71
JVC HR-D750EK £500	Good Average+	Well sorted and relatively affordable NICAM recorder with LP sound only. It is pleasing to use and helpfully equipped, especially when trying to find individual recordings buried in long tapes. Performance is good in relation to price	Hi-fi, NICAM, transmitter LCD remote control	BB	71
JVC HR-S5000EK £1000	Good Very Good	This is the first domestic S-VHS recorder on the market, and it's an unusually well designed one with a wide range of well sorted features and controls. Sound and picture quality are close to state of the art, and miles ahead of any non-S-VHS recorder	S-VHS, Hi-fi, NICAM, LCD remote	R	71
Mitsubishi HS-B70 £1000	Very Good Very Good+	Superb model, and true state of the art picture quality, though you'll need a high grade S-VHS compatible monitor to reap full advantage. The facilities are also wide ranging and generally helpful	S-VHS, Hi-fi, NICAM, LP & SP, programmable remote	R	71
Wordmende V4405K £799	Good Good	Fine basic sound and picture quality, but the RF convertor introduced significant losses. An excellent model, but configured for German home market. VPS compatibility is of no practical use here, and the recorder lacks NICAM	Hi-fi, transmitter handset, digital FX		71
Panasonic NV-FS1 £1000	Poor Good	The control system is poorly organised, with cramped legends and some strange machine logic. Bar code programming is hardly a great achievement either. Picture and sound quality are good, but not state of the art	S-VHS, Hi-fi, NICAM, bar code programming		71
Sanyo VHR-D4710E £900	Very Good Good	Fine colour and moderate detail make for a basically good video section to match a fine sound section. Some of the facilities are a little disappointing however and the deck looks expensive	Hi-fi, NICAM, infra-red headphone remote, digital FX		71

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



PERSONAL MESSAGES

Paul Messenger opens his door to the new three-way Spendor S100s and reports on their visit.

The other day I received one of those phone calls from a longstanding friend in a different part of the business, asking advice about which equipment to buy. Said friend is something of a hi-fi buff by choice rather than trade, and wanted advice about 'real' loudspeakers in the over-£1,000 sector, to use away from walls in a largish room with low ceiling height. And the most important requirement was exceptional bass extension with a comparable loudness capability (lucky for some!).

This coincided (quite coincidentally) with a day trip visit from a pair of Spendor's new, big and beefy S100s, an obvious candidate for my friend's shortlist whose imminent arrival had initially inspired last month's retrospective on Spendor's venerable (and justifiably venerated) *BC1*.

Said day dawned and I slumbered on for a while (as is my wont). But the arrival of these decidedly large loudspeakers, each with a no less substantial and bulky stand, soon got the muscle tone up and the ears ready for action. Only recently starting to sneak onto the market, the S100 is noteworthy not so much because it resembles the *BC1* (which it both does and doesn't, in more or less equal measure), but because new Spendors are rare enough events in themselves, and a new flagship is definitively interesting.

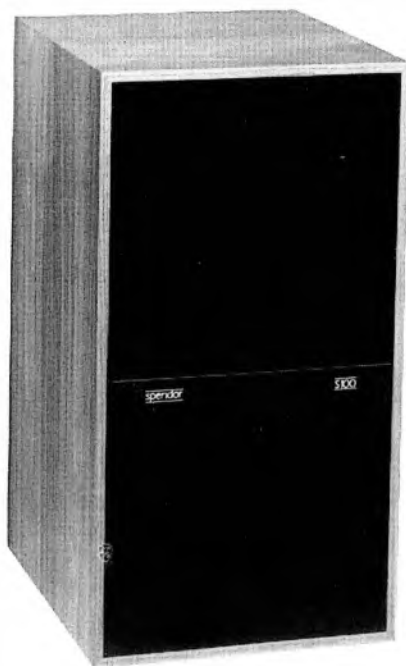
No-one attempting to lift these boxes is likely to have any real qualms about the £1,100 pricetag – had I not been told the figure I'd probably have added £100-£200 more. In sheer physical dimensions it's smaller than the previous big *BC3* and *SA3* Spendors, though in practice the 'footprint' is slightly greater, so the ensemble with large wood-veneered stand is entirely obtrusive, if by no means unattractive.

Unlike the *SA3* and harking back to the *BC3*, the S100 is a three-way model. Moreover, the driver distribution on the front baffle, with the midrange at the top of the cabinet and the tweeter sandwiched between mid and bass unit, shows a clearly discernible genealogical line right back to the BBC *LS5/5*

design. But whereas the *LS5/5* was quite probably the very first loudspeaker to use Bextrene-cone main drivers, the S100 is part of the polypropylene generation, and any resemblance is largely superficial.

The rationale for considering this bigger and more expensive three-way Spendor over, say, the two-way *SP1*, (itself the polypropylene etc evolution of the *BC1*) has less to do with providing a better sound per se than with being able to provide more sound in a muscular sense, by improving sensitivity and power handling. Confront a *BC1* with Sly and Robbie, Sugarhill or the latest House compilation and it will persevere bravely enough, but never sound particularly comfortable or at ease. Such a diet is meat and drink to the S100, which reacts with enthusiasm while putting in a request for a bigger driving amplifier.

One nice thing about Spendors is that there is a recognisable family character. This doesn't disguise the differences between the models, but is evidence of welcome long term design and build consistency. I can't pretend my aural memory is up to spanning the decade since the days I was a regular *BC3* user, but I'd been enjoying the *BC1*s for a week or two when the S100s



visited, and even though the two models possess quite dissimilar overall balances, the family resemblance was immediately striking.

The strength of the S100 lies in having an overall balance which is very well suited to the real world (where listening rooms have walls that invariably augment low frequencies), while also providing the sort of bass control that modern electronic instruments demand. The result is a freestanding 'BBC-style' monitor that is entirely free of any tendency towards boominess – the factor which always threatened to be the Achilles heel of the earlier designs.

Indeed, some (like the friend of the phone call) might find the bass a little too dry and well controlled. There's plenty of energy, speed and power, though the ultimate extension is noticeably less than with bigger boxes like the TDL *Monitors* or Linn *Isobariks*.

For the rest, the speaker is pure Spendor – clear and virtually uncoloured with minimal 'boxiness'. The balance is quite remarkably neutral, the only 'character' as such being a shade too much 'warmth' and 'richness' in the upper bass, lending a slightly 'woody' quality somewhat in the manner of a 'cello. One reason this is

noticeable is that the rest sounds quite remarkably flat, right through both crossover regions, giving a very slightly 'laid back' impression overall.

Another rather clever trick of the S100's is the way the sound balance stays pretty consistent even if the listener moves around, stands or sits. It falls a shade short of KEF's coincident *Uni-Q* driver in this respect, but comes remarkably close for a multi-unit design with a large baffle area. The normally recalcitrant and somewhat perverse three-way configuration seems to work very well here overall, though it's also true to say that the S100 doesn't have quite the 'hear through' midrange transparency of those early short-coil *BC1*s – which in this respect set something of an all time standard for moving-coil loudspeakers.

One of the more useful by-products of three-way operation is a highish sensitivity: Martin Colloms recently measured the S100 at 89.5dB for another magazine, which is a very worthwhile 2.5dB up on his earlier *SP1* measurement for *Choice*. However, such is the character of the S100 that it doesn't sound in any way 'loud', even when really starting to motor. And I never did get any real inkling of the power handling, just the audible evidence of amplifier clipping long before there was any sign of loudspeaker distress.

In all, the S100 is a remarkably good all round loudspeaker; my only real reservation is that it is not truly exceptional in any area. Which brings me back to that phone call. My friend took the trouble to visit several dealers and audition a dozen or more upmarket models, including the S100 and all manner of others, including active and panel designs. Whilst valuing its neutrality, the S100 fell short on scale – the bass goes low but not that low – leaving SD's *SD1* and the TDL Monitor on the shortlist. The eventual vote went to the TDL, despite the fact that its lowish sensitivity required a further visit to the bank manager to arrange payment for new power amps besides (lucky for some).

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