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HI-FI CHOICE

ISSUE NUMBER 108 JULY 1992

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PUBLICATION

PRODUCTS AND EDITORIAL SUBMISSIONS

Hi-Fi Choice welcomes all information on new and upgraded products and services, for possible coverage within the news and reviews pages. However, the publisher respectfully points out that the magazine is not obliged to either review or return unsolicited products. The editor is always pleased to receive ideas for articles, preferably sent first in outline form, with details of the author's background, and – where available – samples of previously published work. He cannot, however, accept responsibility for unsolicited copy and would like to point out that it may take time for a reply to be sent.

READER DIFFICULTIES

Hi-Fi Choice welcomes any technical questions, although these can only be discussed within the pages of the magazine. Regrettably, *Choice* is not in any way able to offer telephone assistance.

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THE GET OUT CLAUSE

While every care has been taken in the preparation of this journal, the publishers cannot be held responsible for the accuracy of the information herein, or any consequence arising from it. Readers should note that all judgements have been made in the context of equipment available to *Hi-Fi Choice* at the time of review, and that 'value for money' comments are based on UK prices at the time of review, which are subject to fluctuation and are only applicable to the UK market.

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Menu

This month's menu piece was inspired by a recent visit to the *Choice* offices by Yamaha, who came to show off the company's latest product range, including a number of new surround sound processors. In the course of a couple of hours one of our conference rooms was turned into a comprehensive cinema set up, complete with a decent size TV and no less than eight channels of surround sound amplification and associated speakers, including a new sub-woofer unit.

The results were fairly spectacular. But then, without wishing to brag, I've been going on about surround sound for at least six years, ever since the same company introduced the *DSP-1* in fact.

The point here is that I knew what to expect. The rest of *Hi-Fi Choice* did not. Their comments ranged from a straight "It blew me away, I've never heard movies sound like that, not even in my local cinema." to "That was far better than I had been led to expect, but after all I've only ever heard surroundsound on a four button midi system." This last comment, entirely unprompted, I would hasten to add, sums up the problem beautifully.

With hi-fi people are quite prepared to accept the fact that, as you spend more money, a system can improve in leaps and bounds; no one would write off hi-fi on the grounds that the ghetto blaster in their kitchen sounds awful. However, it does appear that people are beginning to write off surround sound because they hear it on a rack system, often with only a single pair of speakers, and decide that it just isn't worth following up.

Surround sound has become quite a trendy marketing tool for the knob counting brigade and many of today's midi systems proudly proclaim themselves to be surround sound capable or even claim to transport Kylie to a digitised Church at the press of a button. And bloody awful most of them sound, too.

At the other end of the scale you've got units from the likes of Yamaha, Lexicon and JVC which can do a splendid job, and some of the latest digital implementations of the Dolby Pro-Logic cinema sound decoding chip which are capable of quite superb results. These do, however, require at least four speakers to make them work properly and often five or even six channels to hear them sounding at their best. With pricetags frequently running to £1,500 for the full system (including all the extra speakers) this sort of system richly deserves the appellation hi-fi and is as different from the surround sound button on a midi system as a Sondek *LP12* is from the aforementioned ghetto blaster.

With surround sound, as with just about every other facet of hi-fi, you get what you pay for; so just because your rack system can't give the local Odeon a run for its money, don't ignore what can be one of the most rewarding, not to mention fun, areas of home entertainment. Give a decent Pro-Logic system a chance. Once you've listened to films that way I'm sure you'll be amazed you ever put up with a mono signal fed via your TV.

Andy Benham



Cover photograph by
Chris Richardson.

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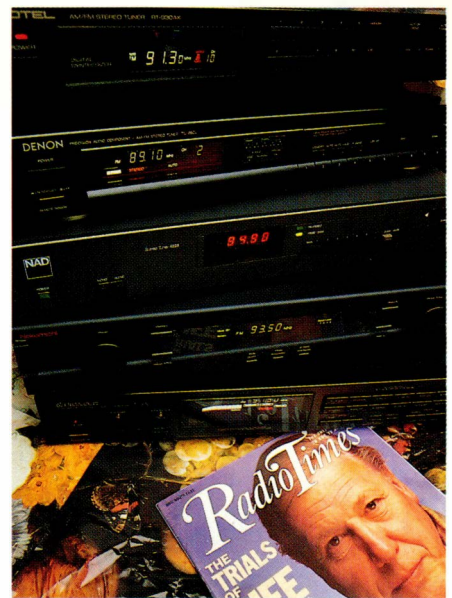
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At a glance information on all the current products that we've tested in *Hi-Fi Choice*. 30 pages of detailed reports including comments on sound quality, compatibility, features and value for money.



Radio gaga: our two part tuner reviews section starts on page 73.

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Amplifiers are the flavour of the month in August's *Hi-Fi Choice*, with over 20 of the latest amps reviewed in our comprehensive group test. Plus the conclusion of our two part tuner survey.

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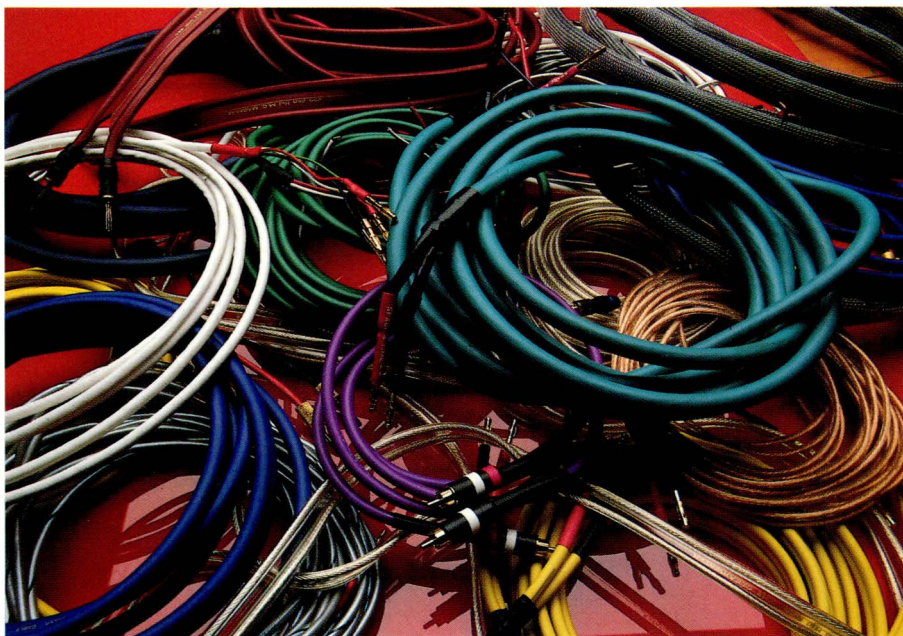
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Paul Messenger visits Boston, Massachusetts in pursuit of the local loudspeakers, and finds the LP620 and LP4200 well worth the trip.



Study your 59 times cable in this month's free interconnects supplement.



Technics unveils DCC line-up

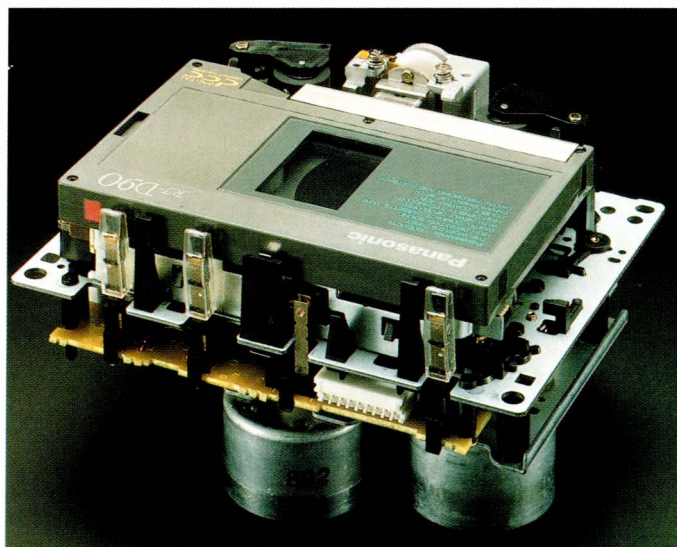
Technics chose its European press seminar to unveil its range of DCC machines, with no less than five different units being shown to the assembled press, along with the *RS-DC10* home deck that had already been seen at the Brown Goods show earlier in the year.

Joining the full size unit were an in-car DCC/tuner, a superbly styled DCC ghetto blaster, a DCC equipped midi system and a pair of DCC personals.

The *RS-DC10* will go on sale in Japan on 21st September this year with a planned initial production run of 1,000 units a month. In Japan the unit will be priced at 135,000 yen (about £570) although the exact UK price has yet to be fixed.

Technics will also be producing blank DCC tapes which will be sold under the Panasonic brand name. 90, 60 and 45 minute tapes are planned with an initial production capacity of 100,000 units a month coming on stream at the same time as the launch of the *RS-DC10*.

MCA records, which is now owned by the Japanese giant, will also be supporting the launch of DCC with a number of MCA titles being included in the 500 promised for the initial launch. An MCA spokesman confirmed that, even though the first machines will not be able to display all the information available via the DCC format — lyrics for example — wherever possible this information will be included on the first cassettes, so that this software



Panasonic software and Technics hardware support DCC.

will be fully compatible with future generations of machines.

MCA titles confirmed for the launch include REM's *Out Of Time* and releases from Nirvana, Boston and BB King, and from September on all MCA's major releases will also be on DCC.

Technics also took the opportunity to present a full technical presentation of the new format, and, on being questioned about the longevity of the new thin film heads, responded that the life should be at least as good as DAT or analogue cassette.

The Micromega variations

French CD player manufacturer Micromega has been making some changes and additions to its ever growing range. Top one box machine, the *Solo*, is now in MkII form incorporating a new PCB layout with board mounted Schaffner power supplies, and a £1,400 pricetag.

There's also a new transport, the £1,000 *Duo CD3*, which incorporates a Philips CDM9 mechanism and another on the way in the form of a *Microdrive* to partner the £299 *Microdac*.

Micromega's distributor, The Musical Design Co, is also marketing the Sterling range of cables, this includes *Silverline* interconnects and a digital link which is composed of a solid silver conductor with Teflon insulation and silver plated braid screening, priced at £65 for a neutrik plug terminated 0.6 meter length.

Piped music

NVA has brought out an unusual new interconnect cable called the Sound Pipe. This is coaxial design constructed from a single solid core signal carrier with a PTFE dielectric inside a 3.5mm OD copper tube, which forms the negative or earth path. The signal lead is a circular sandwich of steel that is covered with a layer of annealed copper and then silver plated.

Sound Pipes supposedly offer 'high end performance at an audiophile price', the price in this instance being £50 for a quarter metre pair, £60 for half a metre and £80 for the full metre.

Multi-room sounds for £80!

Fancy building a round the house system at minimal cost? QED's £80 *Transmatch* is a multi speaker connection device which allows you to connect up to five pairs of loudspeakers to a single amplifier without causing the sort of destabilisation that parallel connection would induce. The *Transmatch* uses impedance matching transformers which maintain the

impedance at four ohms even if five pairs of eight ohm speakers are being driven. Obviously nominal impedances drop, but as long as none of the speakers has a minimum impedance much below 6ohms then there shouldn't be any problems.

On the wattage front, QED recommends amplifiers with outputs between 40 and 80 watts which should be ad-

equated to drive the 'A' speakers to good levels and the four 'B' speakers to levels adequate for background listening.

'B' refers to the four sets of outputs that are connected via the transformers and a switch, whereas the 'A' connection just runs through a switch.

The *Transmatch* also incorporates self resetting overload protection in case things get too tough.

Finding the Sonolith

Electrofluidics, the company behind the *Sonolith* loudspeakers we reviewed last month, has asked us to point out that it can be contacted on (071) 247 0813.

Compact Disc Interactive available at a store near you (if you live in London)

As we reported back in our May issue (hooray for us!) Philips chose the end of April for the UK launch of CD-I, some six months ahead of the original schedule.

The first machines are on sale in 25 outlets across London including Harrods, Selfridges, John Lewis, Covent Garden Records and selected branches of Comet and Dixons. A further 100 outlets are promised for May with the format gradually being introduced over the rest of the country as the year progresses.

The first machine is the *CDI 205* which is priced at £599, complete with a voucher entitling the purchaser to £50 of free software. 32 titles are available for use with the player with prices varying from £14.95 to £39.95. The software is split into four main categories covering children's titles,



games, music and special interest. Philips promises that three to five new titles will be released each month and that around 70 titles will be available by Christmas.

The player itself features a Bit Stream DAC for audio conversion plus a remote control unit complete with a small joy stick type device to enable the user to follow the point and click on screen control system. A separate 'roller controller' is available as an accessory for younger users,

or indeed anyone else who finds the standard remote control difficult to come to terms with.

The downside, again as we reported back in May, is that the *CDI 205* does not include the chips necessary to process full motion video (FMV) so you'll have to wait until the end of the year and buy a plug-in upgrade kit if you want to watch feature films, interactive movies, music videos or any of the other goodies that are promised for next year.

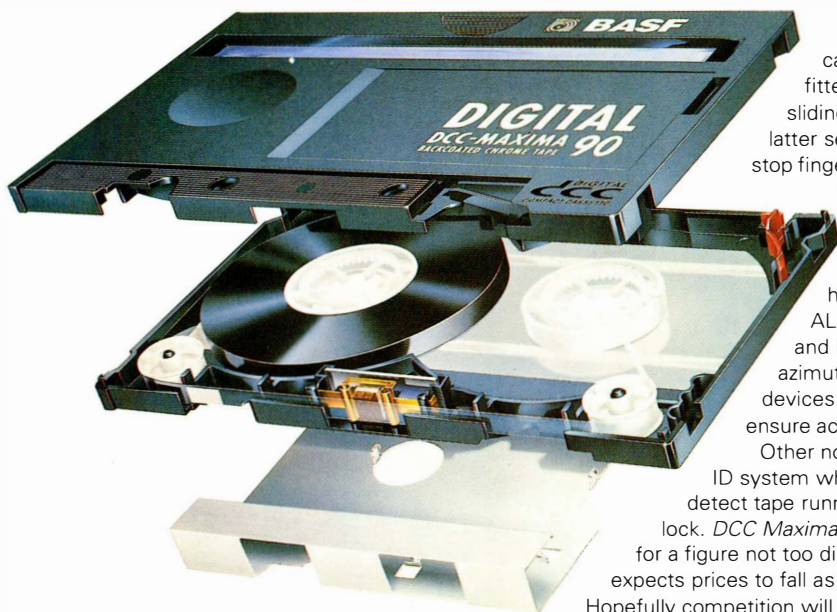
BASF blanks DCC in September

BASF is to launch blank DCC tape in September. In a joint venture with Philips, which makes the tape housings, BASF is to launch the *DCC Maxima* in 60, 75 and 90 minute lengths. Although ferric tape can be used to make DCC recordings BASF has used type II chrome tape for the *Maxima* because of its durability. The tape is composed of three layers, a special DCC oriented rough surfaced backing, the base tape and

the chrome dioxide coating.

The casing is ultrasonically welded together and fitted with DCC's characteristic sliding protection shutter, the latter serving to keep out dust and stop fingerprints getting onto the tape. Other variations from the analogue cassette include the tape alignment guides which inevitably have their own acronyms: ALPs are azimuth locking pins and FATG stands for fixed azimuth tape guide. Both these devices lock into the DCC head to ensure accurate alignment.

Other novelties include a three hole ID system which allows the machine to detect tape running time and a sliding erase lock. *DCC Maxima* tapes are expected to retail for a figure not too distant from £5, but BASF expects prices to fall as production increases. Hopefully competition will have a similar effect.



Stands for . . .

MAF is the manufacturer of a new range of loudspeaker stands designed by Mike Francis. The stands are unusual in that the top and bottom plates have been done away with entirely, resulting in a distinctive design where the speaker cabinet is directly coupled onto the four posts.

The MAF stands are said to channel cabinet resonance down into sand filled columns to earth via 8mm adjustable spikes. They come sand filled, complete with the spikes and Blacktak and are available in three heights: 280mm (with a footprint of 240 by 240mm), 480mm (260 by 210mm), and 580mm (190 by 230mm). All three sizes retail for £170 and other sizes can be made to order. Contact MAF on (0283) 30550.



No top or bottom plates, but plenty of style: MAF stands.

Help!

BADA, the British Audio Dealers Association was founded in 1982 with the objective, among other things, of establishing a code of practise for dealers and making life easier for the hi-fi customer in Britain. Previously only available for communication by post, BADA has now inaugurated a telephone helpline.

As before, BADA will endeavour to resolve disputes that might arise between customers and participating manufacturers or dealers over the supply of goods, try to sort out problems with guarantees and generally seek to aid in the smooth running of the BADA extended guarantee scheme. The number to ring is (071) 226 4044.

Castle keep on expanding

Yorkshire's premier loudspeaker manufacturer, Castle Acoustics, has produced a new model called the *York*. The *York* is a bookshelf size (430x220x260mm) two way design with a 150mm mid/bass unit and a 25mm soft dome tweeter, it costs £320 in black ash or £340 in a variety of Castle's gorgeous veneers.

On the socketry front, it's equipped with two pairs of inputs for bi-wiring/amping. And unusually it has twin reflex ports at the front which probably help with its healthy 89dB efficiency rating. The *York* is also fitted with separate overload protection on each drive unit, making it pretty well party proof, well up to 300watts anyway. Watch the September issue for a full review.

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A wafer thin speaker, sir?

Problems with your personal cassette player? Try as you might, do you find that the music from the headphones just won't go loud enough to adequately annoy your fellow passengers? What you need is a personal speaker system. And Fuji has one available, for free.

Remember Fuji's 'Extraslim' line of cassettes? (If not, refer to *Choice's* blank tape supplement where they were assessed, along with all the other major brands last January.) Well, Fuji is now offering its DR-IX C90 brand for sale with free speakers which are themselves wafer thin.

For the next three months, and while stocks last, six packs of DR-IX C90s come complete with these mini-speakers which are



about the same size and shape as a cassette and which plug into the headphone jack of a personal stereo. The speaker comes in any

colour you like, just so long as it's black.

Yamaha has got you surrounded

Yamaha has hit the market with a whole new range of electronics including six CD players, four DSP units and four cassette decks.

The upper echelons of the CD range have been updated with the latest version of Yamaha's 1-bit conversion system called S-Bit plus. This is incorporated in the company's I-PDM DAC, which features second order noise shaping, a proprietary time base corrector and an eight times oversampling filter.

The players incorporating this technology are the flagship CDX-1060, priced at £600, the £300 CDX-860, which received a good deal of British input in its design and the £250 CDX-660.

The less expensive new models use the well known hybrid 1-bit/multibit Burr-Brown DAC which Yamaha has

christened SL-Bit. The £180 CDX-460 and the £200 CDX-560 also include anti-resonance chassis and remote volume control.

There's also a new multi-disc machine with what Yamaha calls 'Playxchange', which allows you to change up to four discs while the fifth is playing.

The company is also widening its DSP/Dolby Surround range with the DSP-E1000 cinema DSP system, which is basically a pared down version of the highly successful A1000 unit. It features a movie theatre program and 12 DSP programs, Dolby Pro Logic and five channels of amplification and costs £600. The DSP-A500 offers Pro Logic, four DSP programs and weighs in at £450, while the DSP-E200 is a new bottom marker in the range offering Pro Logic and

enhanced surround modes, four DSP programs and three channels of amplification for £350.

On the amps front, there's just one new model, the AX-V401 which caters for A/V as well as the usual selection of audio inputs and remote control; output is 55W per channel.

Cassette-wise there are two single deck and two twin deck models, the £150 KX-260 and £180 KX-360 have two motor transports, optional remote control and the dearer model has a Sorbothane shell stabiliser. Both the new twin decks have dual autoreverse transports and optical end of side detection systems, the KX-W262 costs £200 while the £250 KX-W362 has more features than you can shake a stick at, yet still claims high sound quality. Phew.



'A good deal of British input': the CD-860 is just one of Yamaha's new hi-fi products.

New Sonic Frontiers

High-end distributor MPI has introduced a new range of valve amplifiers from Canadian manufacturer Sonic Frontiers. Currently producing a line preamp and stereo power amp, *Sonic Frontiers* started life in 1987 as a supplier of high grade 'designer' audio components for builders and modifiers of hi-fi equipment. It then went on to produce kit form tube amplifiers and is now manufacturing a growing range of valve electronics.

MPI is distributing the SFL-1 line preamplifier (£1,195) which offers 20dB of gain and utilises a tube/FET hybrid circuit, it has four conventional inputs, a tape loop and a direct input which bypasses all but the volume pot and the gain stage. The SFS-80 power amp (£2,295) is a low feedback 80W stereo design with a pair of Gold Aero KT88 tubes per channel. Both models have stainless steel cases and use top grade passive components from the likes of MIT Multicap, Solen and WIMA.



Take a tube trip to the Sonic Frontiers.

A mkIII Innovation

Audio Innovations has updated its Series 1000 monoblok power amps to MkIII status. These pentode tubed beasts now generate 50watts a side and cost £1,499 a pair. Using its CAD facility, Innovations has optimised the circuit layout to avoid interstage interference and used a 2.4mm 1oz copper board for the purpose.

Each monoblok uses four EL34 output tubes arranged in ultra-linear push pull configuration to give an output capable of driving a wide variety of loudspeakers.



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HIGH-FIDELITY. SEPT 1990. "IT LOVES MUSIC, THE A400. IT LOVES IT WITH A VENGEANCE." MARK PAYTON.

AUDIOPHILE. SEPT 1990. "EVEN IF YOUR BUDGET EXTENDS TO £1,000, IT COULD BE EXACTLY WHAT YOU'RE AFTER." JIMMY HUGHES.

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AVON		GLOUCESTERSHIRE		MIDDLESEX		WILTSHIRE	
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Paul Roberts, Weston-Super-Mare	0934414423	Robbs, Gloucester	0452419777				{ 0793526393
Radford Hi-Fi, Bristol	0272428248					P R Sounds, Melksham	0225 708045
		GREATER MANCHESTER		NORFOLK		P R Sounds, Trowbridge	0225 777799
BERKSHIRE		Clearstone Hi-Fi, Manchester	061-8351156	Adcock & Sons, Watton	0953881248		
B & B Hi-Fi, Bracknell	0344424556	Hamlets Audio Visual, Ashton-u-Lyne	061-3435127	Martins Hi-Fi, King's Lynn	0553 761683	WORCESTERSHIRE	
B & B Hi-Fi, Maidenhead	0628 73420			Martins Hi-Fi, Norwich	0603 627010	David Waring Cameras & Hi-Fi, Worcester	0905 27551
B & B Hi-Fi, Newbury	063532474	HAMPSHIRE					
B & B Hi-Fi, Reading	0734 583730	Bryants Hi-Fi, Aldershot	025220728	NORTHAMPTONSHIRE		YORKSHIRE NORTH	
Frasers Hi-Fi & Video, Slough	0753520244	Cristavision, Fareham	0329288660	H.G. Rapkin, Northampton	060437515	Maxwells, Northallerton	0609 773535
Frasers Hi-Fi & Video, Wokingham	0734 794988	Now That's Hi-Fi, Portsmouth	0705 811230			Scarborough Hi-Fi Centre, Scarborough	0723 374547
		Now That's Hi-Fi, Portsmouth	0705864756	NOTTINGHAMSHIRE		Vickers Hi-Fi, York	0904 629659
BUCKINGHAMSHIRE		Sinclair Youngs, Basingstoke	{ 0256 21307	F.L. Smith Electrical, Mansfield	0623655684	YORKSHIRE SOUTH	
B & B Hi-Fi, High Wycombe	0494535910	Southampton Hi-Fi Centre, Southampton	0703 228434	F.L. Smith Electrical, Worksop	0909 479770	Superfi, Sheffield	0742 723768
				Forum Hi-Fi, Nottingham	0602 622150		
CAMBRIDGESHIRE				Nottingham Hi-Fi Centre, Nottingham	0602786919	YORKSHIRE WEST	
Cambridge Hi-Fi, Cambridge	022367773	HERTFORDSHIRE		Parker High Fidelity, Nottingham	0602476377	Amrik Electronics, Bradford	0274 722530
The Hi-Fi Company, Peterborough	0733341755	Chew & Osborne, Bishop's Stortford	0279656401	Superfi, Nottingham	0602412137	Amrik Electronics, Leeds	0532752285
University Audio, Cambridge	0223354237	Herks Hi-Fi, Hoddesdon	0992 441172			Eric Wiley, Castelford	{ 0977 553066
		Hi-Way Hi-Fi, Hemel Hempstead	0442235755	OXFORDSHIRE		Superfi, Leeds	{ 0977 556774
CHESHIRE		RadioLux, Watford	0923229734	Sound 'n' Vision, Bicester	0869246491		{ 0532449075
Car & Home Stereo, Macclesfield	0625 432707			Witney Audio Centre, Witney	0993702414		
Hamlets Audio Visual, Cheadle	{ 061-428 5278	HUMBERSIDE				JERSEY	
Hamlets Audio Visual, Stockport	{ 061-4286367	Superfi, Hull	048224051	SHROPSHIRE		Fotosound, St Helier	053459990
Tomorrow Studios, Chester	061-4763500			Shropshire Hi-Fi, Shrewsbury	{ 0743232065		
Tomorrow Studios, Warrington	0244320414	ISLEOF WIGHT		W. Owen, Telford	{ 0743232317	NORTHERN IRELAND	
	092536215	Russells, Newport	0983 523864		0952 613818		
				SOMERSET		CO. DOWN	
CLEVELAND		KENT		Paul Roberts, Taunton	0823 270000	Hi-Fi Experience, Belfast	0232249117
Gilson Audio, Middlesbrough	0642 248793	Howes of Southborough, Tunbridge Wells	{ 0892 528682	Telefringe, Frome	037362598	LRG Sound & Vision, Belfast	{ 0232732452
		Kimberley Hi-Fi, Bexleyheath	081-3043272				{ 0232451381
CORNWALL		Panatec Sound & Vision, Gillingham	0634573141	STAFFORDSHIRE		CO. ANTRIM	
ETS Electriccentres, Helston	0326573285	Panatec Sound & Vision, Maidstone	0622661488	Purkiss Hi-Fi, Hanley	0782265010	LRG Sound & Vision, Larne	0574272757
ETS Electriccentres, Penzance	073664274	V J Hi-Fi, Folkestone	030356860	Universal Electronics, Cannock	0543502118	Nicholl Bros, Ballymena	026649616
H.B.H. Woolacotts, Bude	0288 352269	V J Hi-Fi, Margate	0843226977				
Truro Hi-Fi, Truro	0872 79809	Whitstable Tele-Radio, Whitstable	0227272028	SUFFOLK		SCOTLAND	
				Avalon Audio Vision, Ipswich	0473281922	GRAMPIAN	
CUMBRIA		LANCASHIRE		Peter Watts, Bury St Edmunds	0284703045	Autosonic, Aberdeen	0224 573777
Kenneth Gardner, Barrow-in-Furness	0229820308	Clearstone Hi-Fi, Bolton	020431423	System Sound, Sudbury	078772348	Holburn Hi-Fi, Aberdeen	{ 0224585713
Peter Tyson, Carlisle	{ 022846755	Kenneth Gardner, Lancaster	052464328				{ 0224 572729
	{ 022846756	Norman Audio, Blackpool	0253295661	SURREY		MID LOTHIAN	
DERBYSHIRE		Norman Audio, Preston	{ 077253057	Audiolite, Thornton Heath	081-6533657	Bill Hutchinson, Edinburgh	031-667 2877
Parker High Fidelity, Derby	0332367546	P & A Audio Video, Ormskirk	0772555769	Cosmic, Addlestone	{ 0932854522		
Roy Smith Electrical, Chesterfield	0246 234953	Romers Hi-Fi, Blackburn	0695573456	Tru-Fi, Leatherhead	{ 0932851753	STRATHCLYDE	
		Tomorrow Studios, Wigan	0254 887799	Tru-Fi, Redhill	{ 0737766128	Bill Hutchinson, Glasgow	041-2482857
DEVON			094237977	Weybridge Audio, Weybridge	0932851121		
Bernard Smith, Barnstaple	0271 143503	LEICESTERSHIRE				TAYSIDE	
Radford Hi-Fi, Exeter	0392218895	Mays Hi-Fi, Leicester	0533 625625	SUSSEX EAST		Robert Ritchie, Montrose	0674 73765
Radford Hi-Fi, Plymouth	0752226011	Stuart Westmoreland, Loughborough	0509 230465	Smythe & Barrie, Eastbourne	032329192		
Upton Electronics, Paignton	0803551329	Stuart Westmoreland, Melton Mowbray	0664 411511	Sunderland Electronics, Brighton	0273774113	WALES	
						CLWYD	
DORSET		LINCOLNSHIRE		SUSSEX WEST		Lloyds TV, Video & Hi-Fi, Wrexham	0978 364168
Movement Audio, Bournemouth	0202529988	Superfi, Lincoln	0522 520265	Cristavision, Chichester	0243 775444	Owens, Colwyn Bay	0492 530982
Movement Audio, Poole	{ 02027 30865			Sunderland Electronics, Worthing	0903201187		
	{ 02027 21983	LONDON				GLAMORGAN	
ESSEX		Babber Electronics, W13	081-5796315	TYNE AND WEAR		Tele Electrical Services, Bridgend	0656654156
A V Tech, Ilford	081-5146688	Brians Hi-Fi, W1	071-631 1109	Bill Hutchinson, Newcastle-upon-Tyne	091-230 3600	Quinns,, Swansea	0792 773544
Chew & Osborne, Epping	0378 74242	Covent Garden Records, WC2	071-3797427				
Chew & Osborne, Saffron Walden	079923728	Hi Spek Electronics, N3	081-3491166	WARWICKSHIRE		GWENT	
Classic Sound & Vision, Southend-on-Sea	{ 0702461634	Kamla Electronics, W1	071-3232747	Carvels of Rugby, Rugby	0788 541341	Hi-Fi Western, Newport	0633 262790
Peter Foulkes, Chelmsford	{ 0702 600130	Light & Sound, E6	081-4721373	The Hi-Fi Company, Leamington Spa	0926888644		
Peter Foulkes, Colchester	{ 0245491479	Myers Audio, E17	081-5207277			GWYNEDD	
Peter Foulkes, Maldon	{ 0206767428	Spatial Audio, W1	071-6378702	WEST MIDLANDS		Owens, Bangor	0248362951
Twenty 20 Audio Visual, West Thurrock	{ 0621 853148	Stereo Regent Street, W1	071-2872458	Bridge Hi-Fi, Walsall	0922640456		
	{ 0708891818	Superfi, NW1	071-3881300	Coventry Hi-Fi, Coventry	0203440529		
	{ 0702206835			Naam Hi-Fi Vision, Birmingham	021-633 4944		
Waters & Stanton, Hockley	{ 0702204965	MERSEYSIDE		Naam Hi-Fi Vision, Coventry	0203632086		
Waters & Stanton, Hornchurch	{ 0402447465	Beaver Hi-Fi, Liverpool	051-709 9898	Superfi, Birmingham	021-6312675		
Woolfmans, Basildon	0268285922	Tomorrow Studios, Southport	0704531500	Universal Electronics, Wolverhampton	090223741		

CHOICE SESSIONS

DCC's Conundrum

Is DCC going to have the same impact on the marketplace that CD did? Andrew Cartmel doubts it.

I've given up believing in a rational universe, so I am quite prepared to accept that DCC could be the consumer marketing success story of the Nineties. However, there are a few points which are worth considering with regard to this new format, and which could make the difference between soaraway success and a quick rocky downhill ride to the Betamax/Eight Track graveyard.

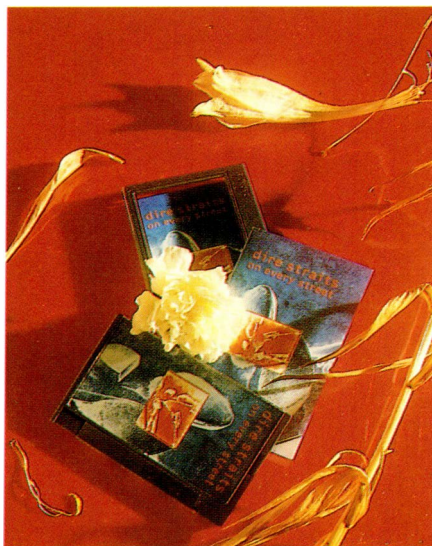
Initially my doubts about DCC were alleviated by a well mounted Philips presentation for the retail trade and press. I was less than impressed with some of the hyperbole on offer, but what did impress me was the planning of the DCC marketing campaign. Philips clearly anticipates a success on the scale of CD, and perhaps even greater, and it was obvious that someone from the company had done a lot of homework preparing for this coup.

One of the cornerstones in Philips marketing strategy is the fact that (unlike DAT) DCC builds on the existing cassette format. There is a staggering number of cassette decks per British household (an average of seven, according to the Philips spokesperson), so a digital version of this pervasive format seems to make a great deal of sense. Every one of these existing tape decks is potentially replaceable by new DCC machinery. Or is it?

Let's begin by considering the sort of people who use cassette. I think seven decks is a high number, so let's call it seven *drives* per household. We'll characterise this imaginary average household as a nuclear family where one of the kids has a music centre in her bedroom, both kids have personal stereos, there's a family music centre (with two drives), a cassette deck in the car and Fido the dog has a Sony Pro Walkman.

This is the household which has got Philips' market research teams so excited. Now ask yourself one question; are these the sort of people who are concerned with high quality audio reproduction? The answer is no, absolutely not (with the possible exception of Fido, who has par-

This month we investigate a passive black box which is supposed to improve digital recordings and asks whether there is room in the mass market for DCC.



The format of the future? DCC has yet to prove itself in the real world.

ticularly sensitive ears) because people who are concerned with high quality audio reproduction wouldn't be listening to cassette in the first place. Consequently, Philips might be wrong to try and persuade this household to buy DCC on the basis of better sound alone.

And since DCC intends to build on the appeal of cassette, maybe we should also briefly mention price. I suspect one reason Fido's owners possess seven cassette drives is because of the low price of tapes. This is a family that buys the cheapest tapes it can get in multi packs from super-

markets. They would never consider splashing out even as much as £1.50 for a budget chrome cassette, simply because they don't see any advantage in doing so. So how will they feel about paying three or four times that amount for a blank DCC? It's an interesting question.

Of course, the other point arises from the price of the prerecorded software. Unfortunately it now looks as though this will be pretty much the same as CD, and quite frankly, that's just too much. As dad will be the only one able to play the prerecorded tapes in the first place, at least until our imaginary family has completely re-equipped with DCC, you are left with a cassette that is unusable on the vast majority of the systems in the house. The other problem with this pricing strategy is that the younger members of the family, who at present are the ones who buy tape because its cheap, will no longer be able to afford prerecorded software. As a result of which they'll either illegally tape it off their mates, thus reducing the very profits the record companies are so desperate to maximise, or even worse, they'll just get bored with music altogether and spend the money on cartridges for their Gameboy or whatever.

In the end it is up to the consumer to decide whether the record companies are allowed to get away with it. I for one certainly won't be buying any prerecorded software at £13 a go and if everyone else follows suit then the record companies may well have to reconsider.

Shelley shocked

Want to experiment with the sound of your CD player? Andrew Cartmel listens to a new product which exists somewhere in the twilight zone between full scale upgrade and tweakery.

It sometimes seems that the pursuit of hi-fi is largely a matter of hauling home and connecting to your system an endless series of large black boxes. That isn't really the case, though, and you shouldn't let anyone tell you that hi-fi isn't a spicy, fascinating and endlessly varied sphere of endeavour. For example, every now and then you find yourself hauling home



and connecting to your system a black box which is extremely small.

Such is the case with the *Francinstien Plus*, a chunky matt black metal unit small enough to fit into one hand. *Francinstien* (sic) stands for Frequency Adaptive Non-linear Crosstalk Injection Network for Stereo Image Enhancement, but don't let that put you off. The box contains a 'passive audio enhancement matrix' reportedly developed for the professional studio market and which Select Systems is now promoting for use in hi-fi circles. It retails for just under £150 and has a baby brother, the standard *Francinstien*, which costs a mere £80.

What does this diminutive black box do for your money? Well, you plug your CD player outputs into the back, route the signal from there to your amplifier and the result, according to Select Systems, will be an improvement in 'digital audio's lifeless stereo image'.

Jason Kennedy has a word for this kind of thing. The word is 'voodoo'. Nonetheless, I am game. If nothing else, this is a chance to listen to some interesting CDs which have been languishing unplayed beside the gramophone. I pull out some likely discs and put them on, using the *Ariston Maxim CD3* in ordinary, *Francinstien-less*, mode. I let the music play, get the *Francinstien Plus* all set up and ready to plug in, then relax and enjoy *Asleep At the Wheel*. *Asleep At the Wheel*? Yes, I'm afraid it's music by people in cowboy hats. It's called western swing and you should count yourself lucky that I didn't have any Bob Willis and his Texas Playboys on CD. After an hour or so of acclimatising myself to the sound, I put

the music on pause and connect up the *Francinstien Plus*, not as simple a task as it could be, given the challenging lack of any markings on any of the four phono sockets on the back of the little black box.

I take the music off pause and sit down again. I'm making a definite effort to not make a definite effort to hear anything, but I'm beginning to notice a difference. It's most immediately evident on percussion and voice and it feels like there's more air around some of the instruments, a better sense of ambience.

But the most striking effect is still on the voices. Time for a change of programme, I think. Ingrid Chaves is yet another protegee of Prince and her debut album is probably the kind of music your mother told you not to listen to: husky, erotic vocals and a slow motion sensual dancebeat drenched in psychedelia. If Vaughan Williams' *Fantasia on a theme by Thomas Tallis* is more your scene you better be careful because this music might make your pacemaker stop. It pushes you back into your listening seat like a big warm hand. Oh-oh. Using the *Francinstien Plus* there's an airiness even on these electronic tracks. They're more pleasant, more listenable, acquiring the hypnotic quality of good music. Synth chords are biting into the mix with better shape and more immediacy. With direct input from the *Ariston* I'm getting good results as well, but there's a definite sense of flatness, of something missing after listening via the *Francinstien Plus*.

Putting the *Plus* back in, I find the music speckled with all sorts of lively synth noises I haven't heard before, the sort of noises Fifties Hollywood flying

saucers used to make while they were invading the earth. But best of all Chavez's voice seems more rich and real, with firm skin-squeaking sexiness, more life and vibrancy. The whole CD sounds warmly and seamlessly rhythmic.

Rave from the grave

If I had to summarise the effect of the *Francinstien Plus*, I would say that while using it the CDs sounded better defined, the soundstage having a more definite shape. It was as if there was more air around each strand in the mix, allowing you to hear it more distinctly, more separately.

Without it, the CD player provided music that was bigger but rougher, sometimes giving more impact because it was more of a single image, less well separated.

There were two sure signs that this product had succeeded, at least in this particular system, for this particular listener. Firstly, the *Francinstien Plus* was not immediately unplugged after the listening sessions, taken out of the system and dumped to gather dust in the voodoo vault. Secondly, I didn't immediately want to switch the CD player off and relax with some LPs. Instead I went on to make further explorations of my CD collection.

If you've already upgraded your DAC and you're casting about for another relatively low cost improvement for your CD player, then perhaps you should get your dealer to lend you a *Francinstien Plus*, and see if you find the results as agreeable as I did. After all, it is only a very small black box and you might even be able to smuggle it home without your spouse seeing it.

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STATEMENTS

If you've looked beneath the cable supplement on the cover this month, you'll have caught a glimpse of this month's gorgeous amplification combo, the John Shearne Phase 1 preamp and dual mono power amp. John Shearne may not be a name that's familiar to many of you, but he has been involved in serious audio for quite a while now, acting as the agent for Tim de Paravicini's EAR amplification company. So he has an ear for quality when it comes to sound and it would seem that he has got an eye for quality when it comes to appearance. The Shearne amps have a striking blue, marble effect finish and tasty chrome knobs; they are very subtle and desirable looking beasts. Depending on the lighting conditions the effect of this finish can be almost unnoticeable or striking, the latter requiring something like a direct halogen beam for maximum impact.

But they're not just pretty fascias. They weigh in at a serious £1,099 for the preamp and £1,199 for the 80watt power amp and are suitably equipped. The preamp has five line inputs alongside both moving coil and magnet inputs for your turntable, with outputs consisting of two tape and one pair of chunky main output sockets. The power amp is pretty straightforward, the usual multi-way output sockets, IEC power input and, not quite so run of the mill, two on/off switches.

John wouldn't say a great deal about

Can Jason Kennedy be weaned onto transistor amplification (even if it costs over £2,000)? Will Andy Benham be won over by a high-end Dolby S deck just as DCC dawns? Read on.

the design, but he went as far as to mention that he wanted to create an amplifier that incorporated the best qualities of valve designs but used transistors for their longevity and durability. Consequently, the preamp's circuit design is more like that found on a valve amp.

Solid state of mind

So much for the hype, what do these beauties do when placed in a system consisting of a Voyd/Audio Note arm/Audio Note IO record player, Meridian 206B and Rotel RCD 965BX CD players and Audio Note AN-E loudspeakers, a system that usually revolves around valve amplification of the finest variety? The answer is that they do very well as a line amp and marginally less successfully with the IO. This cartridge's anemic output and fondness for non-existent input impedances meaning that the preamp had difficulty in extracting enough level without introducing low level hum. I tried using a step up with the MM input but this introduced a degree of de-focusing, an increase in bloom and consequently

scale that, although not unappealing, wasn't that desirable. As it was, results, with the MC input were a bit drier and more bold than I'm used to, with good resolution of detail. While not exactly laid back by tube standards, the Shearne combo was capable of relaxed performances when they were called for. And of course it could boogie when the Pearl Jam hit the platter, going loud without losing it and driving the band's current offering *Ten* right to the spot. Noting, however, the amount of hum being produced when the needle left the groove, I decided to check out the amp's line performance the painless way (ie, non-digitally) with a Michell Iso phono stage. This had just returned from a 'setting up for the IO' session with the designer, Tom Evans, and so was well suited to the task. It restored some of the harmonic detail I had been missing and allowed the amps to put in a very convincing performance.

For the sake of having a point of reference that wasn't heretically expensive and bedecked with vacuum tubes, I compared the Shearne with a Pioneer A-400. Under the circumstances the A-400 put in a creditable performance but was no match for the Phase 1's textural and dynamic resolution. I also took the Shearne power amp out of the loop and rigged up a scenario with the Audio Note *Kegon* power amplifier (which has its own volume pots) and aforementioned *Iso*, whereby I could com-

pare the signal going via the preamp and one extra interconnect with the signal going directly to the *Kegon*. Its character turned out to be pretty subtle, just a slight veiling and softening. Removing it from the chain increased clarity and dynamics but not dramatically.

With the two digital sources, results were much the same, what little character the Shearne's have being unable to compete with the character of the source components. The Rotel, which had been cooking for a good two weeks, produced the more relaxed and enjoyable sound, whereas the cooler Meridian was more hard hitting, solid and powerful, but a bit wearing as well. Swapping speakers from Audio Notes to Vandersteens warmed up the tonal balance and reduced transparency, making the Meridian the more appropriately balanced source. This latter pairing performed quite nicely, delivering welly without inflicting pain and offering good depth and substance.

At the end of the day I found the Shearne amps to be an interesting alternative to the usual tube selection. They are powerful and capable of great subtlety when the source has it on offer. Phono performance would undoubtedly have been more impressive with a more powerful (output wise) cartridge and the combo's transparency is capable of making a fine job of the best line sources. Has John Shearne succeeded in making a transistorised design sound as open and dynamic as tube amp? It depends on what sort of tube amp, but I'm sure some of the more powerful pentode designs on the market have a very similar character.

Jason Kennedy

British cassette decks are about as rare as the proverbial rocking horse droppings, and, unless you've been unlucky enough to have your conversation with the local constabulary recorded courtesy of a Neal professional deck, it's unlikely that many of our readers will be old enough to remember the last UK built cassette deck.

Still, if ever a product deserved the title 'Statement' then Arcam's debut cassette deck, the £850, Dolby S equipped *Delta 100* is it. Given the current state of the home recording market and the imminent launch of both DCC and Mini Disc, I suspect that Arcam's John Dawson must consume at least four Weetabix for breakfast. It would take three to enable a small British manufacturer to launch any type of cassette deck, but to go right for the very top of the market, and with a deck based around Dolby's still relatively new noise reduction system, takes bottle on a scale that few Japanese manufacturers have been able to match.

Price wise the deck sits head and shoulders above anything that Arcam has done before, but there is perhaps a clue to its

origins in the name of Arcam's parent company A&R Cambridge. A&R stands for amplification and recording, and refers back to Dawson's roots in the pro-sound industry.

Taking the *Delta 100* from its packaging confirms that this is something slightly different from the run of the mill. Rather than being able to pick it up with one hand, as is the case with most of the Far Eastern competition, the Arcam is a definite two handed job, and one to be lifted with your knees and not your back at that.

The styling is rather utilitarian, giving the deck a Germanic feel, something which is further underlined by the build quality, which wouldn't be out of place on a battleship.

The transport control keys, arranged in a row along the bottom of the fascia, are sturdy, rectangular affairs, with a very firm action. Above these you have a row of rotary selectors which look after mundane things such as record and output level and balance, as well as the more sophisticated facilities such as calibration and bias settings.

Above these is a row of small, round buttons which take care of the rest, including the selection of that S type noise reduction system.

The heart of the machine

Taking the lid of the beast reveals that approximately 25 per cent of the internal volume is taken up with noise reduction circuitry, with no fewer than six boards being employed to cover encoding and decoding of Dolbies B, C and S. The heart of the machine is a well respected Denon tape transport and associated logic circuitry, while the same company has also provided the headblock.

Although the ultimate assessment of the deck's sound quality will have to wait until the next cassette decks issue (October), when the Arcam can be compared with the latest S type equipped competition, I think I can fairly say that it hasn't got too much to be worried about. I tried it out with a variety of formulations from

the TDK range, and the metal MA in particular gave some superb results.

The lack of background noise with S type noise reduction is a massive plus and one which would probably lead me to use it most of the time. Although Dolby C could give it a close run for its money at times, when reproducing the subtler details of female vocal for instance.

The interesting thing was to move these test tapes over to the car, where they were played on an ancient Blaupunkt. When Dolby first demonstrated S type noise reduction it tried, and failed, to convince me that S type was backwards compatible with B type. In a decent system in the domestic environment I still don't like S type tapes played on B type noise reduction circuits, but in the car, with much higher ambient noise levels and a less analytical system, S type really comes into its own.

The lack of hiss was particularly apparent with the Blaupunkt which gave much the same sound as FM radio, in that it was obviously slightly compressed but in such a way that I still enjoyed the music and didn't spend time pondering the fact that I really ought to get around to installing a decent tape deck in the car.

When I first took this deck home I was very impressed by the engineering, but kept on coming back to the question of who in their right mind would buy an £850 cassette deck just as the domestic recording world is about to go digital. After living with it for a month or so, the reason is actually quite simple. The *Delta 100* is capable of making excellent recordings for home system use, but more importantly, these tapes can then be used to very good effect in the car, on the ghetto blaster in the kitchen, on the beach in a Walkman and even in that naff cassette radio that sits by the side of the bed. And let's face it, even if DCC or Mini Disc do take off at warp factor 12, it's still going to take most people a hell of a long time, not to mention money, to replace every single tape drive with its digital equivalent.

Andy Benham



Alluring on blue velvet: Arcam's British Dolby S equipped *Delta 100* cassette deck.



Barn yesterday

Dan Houston disappears into the depths of the English countryside and takes a journey into the past. Photographer Chris Richardson acts as his guide.

This month's host believes that maximum obscurity will achieve maximum security, at least as far as his country weekend home is concerned, to the point that his first question was: "Could you say that I lived in the Channel Islands?"

Our anonymous audiophile, a silver haired, middle aged medical professional, retreats to his 'room', and his garden, from London at weekends. Well, retreat is hardly the word; it's more like a full scale tactical withdrawal into a rural hideaway which even local villagers found difficult to locate, pointing vaguely down a B-road

into the spring countryside when we asked for directions.

Eventually we found our way to this reconstructed 1750s oak barn, bought from a neighbouring farmer in 1976. It has been added onto the main house, originally a farrier's cottage dating from the 15th Century. "The farmer was going to burn this barn down and so I gave him a thousand pounds for it," our host explains, "I was able to sell the roof slates for £700 so it was a good deal. We got a professional to dismantle and rebuild it. We've covered the outside in a six inch skin of fibre glass, with tiles over the top, which gives it

good insulation. It took a year to complete although the barn itself was quite simple to put together; they were always made up like kits before being taken to their sites and knocked together.

"We raised the lawn and rebuilt the barn with a ha-ha (a kind of ditch or trench) around it. The floor is concrete overlaid with battens which are covered with medite boards and then woollen carpet. We did that primarily for insulation but I think it has also helped to create a good acoustic."

He's right. The first thing you notice on listening to music in here is an acoustic

ASPIRATIONS

background which is big but not bright, highly appropriate for the classical records we played. The open gables above and the sheer space available prevented any unwanted echoes or boominess from the sound system.

Ensnconced in a heavy oak cabinet at one end of the room, the system combines the best of marques like Linn, Koetsu, Meridian, Audio Research, Krell and ProAc. It was bought from KJ Leisuresound in London's West End and KJ's manager, John Smith, described this barn as a 'fantasy hi-fi room'. It's easy to agree, sitting here with the ProAc Response 3s ably reproducing the soprano

tive surfaces, which accounts for the absence of echo.

In between the upright oak supports our host and his wife have created a gallery of artifacts bought on their travels around the world. "We couldn't have any pictures in here, or anything that goes across the upright timbers, which are the whole theme of the room," he says. This eclectic collection includes a whole cast of Balinese shadow puppets pinned over one wall, casting their mystical shapes on the plaster in the afternoon sun. Other items come from Tibet, Africa, Mexico and Papua New Guinea ("We sent a crate of stuff home from there.").



Main picture — barn to be wild: artifacts from the untamed corners of the planet coexist with high-end hi-fi. Above: hardware and software nestling in a custom built cabinet. Left: a ProAc Response III in matching oak finish.

voice of Gundula Janowitz singing Richard Strauss's *Four Last Songs*, with Karajan and the Berlin Philharmonic Orchestra, on a 1974 LP Deutsche Gramophon recording (from days when DG could still cut a good record).

New barn baby

On one side of the barn, large sliding plate glass doors give uninterrupted views over rolling farmland; on the other side smaller windows complement the architecture of the main house. Dormer windows in the roof fill this room with light, emphasising the contrast between the old barn beams and simple white plaster. Apart from the plate glass windows, covered with venetian blinds, there are no large reflec-

Our host's favourite finds include a Juju bag from Papua and a Botswana Bushman's purse and loincloth made from discs of ostrich eggshell.

Tinkling the ivories

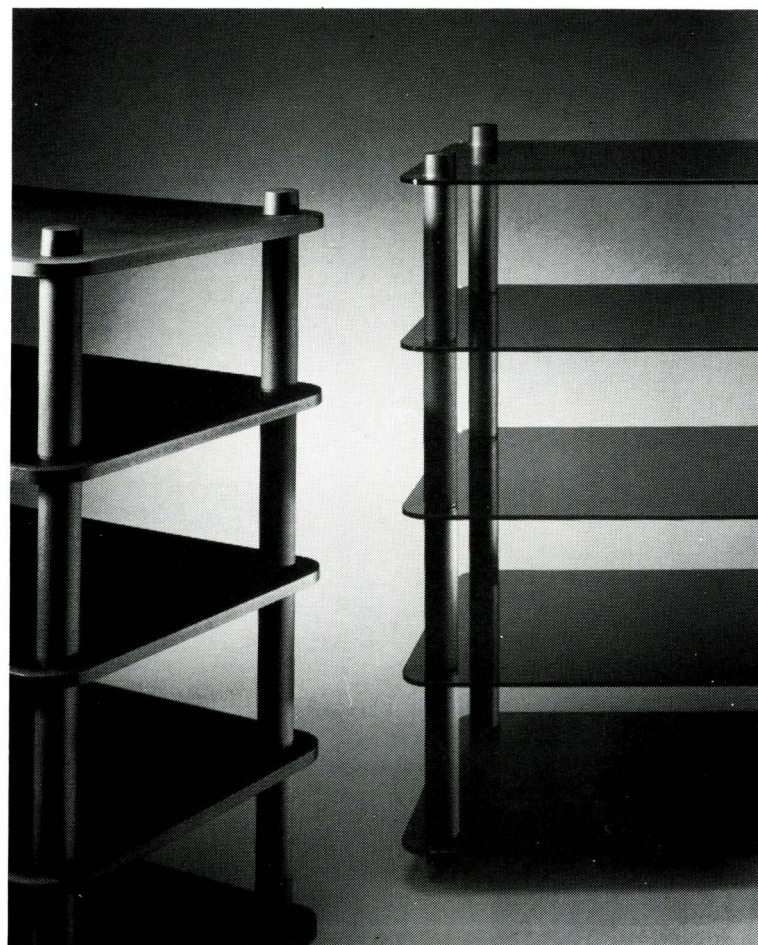
Our host has always been musical, singing in a choir from the age of seven. He also plays the piano: "I'm not brilliant but I enjoy trying, it's a bit like beating my head on a brick wall." His interest in hi-fi dates back to the time of Leak's heyday, from where he graduated to a Quad system. "I still have the Quad valve preamplifier and power amplifier for listening to concerts on television in the other room, but I decided to upgrade the main system and went along to KJ Leisuresound to find out what was new.

"I had no idea of what was available or what a good system costs these days. I had a listen to some equipment there, and I particularly liked the Krell power amplifier and the Meridian CD DAC and transport combination. I was interested in some



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electrostatic loudspeakers — I had been using some big Japanese box and cone loudspeakers for years, but I found most of the electrostatics sounded very dry. They lacked the energy I was looking for. When I first heard these ProAcs I immediately knew I wanted them."

The Linn *Sondek* and *Zeta* tonearm were retained from the previous system, with the *Lingo* power supply being added to upgrade them. "The powersupply makes a difference to the Linn, although I mostly play CDs now, mainly because they are easier to use. However I do think records sound better, and they seem to have more lifelike qualities to them."

Having said this, he breaks off to point out the replay capabilities of the Meridian with a recent Decca CD of Carlo Curley playing romantic organ music called *Brightly Shining*: "Listen, just listen to this ... you can hear him taking his feet on and off the organ pedals."

"I don't think I can get much nearer to the real thing than this. I certainly wouldn't want to change anything here," our host says, visibly finding conversation difficult with the system demanding so much of his attention.

Hi-fi to go

Most of the equipment was listened to at KJ, rather than being auditioned here; our host put his trust in his dealer. "I didn't even listen to the Koetsu *Urushi* cartridge," he says. "After all, it comes very well recommended doesn't it?"

The first stage of installation was hiding the lengths of massive Tara Labs loudspeaker cable, which look like strings of untwisted sausage. These are taken from the system cabinet under the floor to the ProAcs.

"It took me a long time to get those down. I had to take up the carpet and then saw out a couple of nine inch channels in the blockboard. I laid the cable between the Rockwool and then put it all back again! Apparently some people don't mind these speaker cables trailing everywhere, but I ... we ... had to hide them, especially as the speakers are out in the middle of the room."

The next stage was taking a piece of the oak from the barn and asking ProAc to match it as closely as possible. At the same time the light oak cabinet was commissioned from Clive Howdle, whose shop was near KJ in Marylebone High Street. 'Light' only refers to the colour; when it arrived with the rest of the system it needed four men to carry it in. "It's not going anywhere," remarks its owner.

This cabinet is the *piece de resistance* of hi-fi furniture, made especially with this



Top: angled shelves help the amps keep their cool. Above: carved wood figures preside over a Linn Sondek.

The System:

Linn <i>Sondek</i> record player	£579
<i>Zeta</i> tonearm	£469
Koetsu <i>Urushi</i> cartridge	£1,745
Linn <i>Lingo</i> power supply	£559
Meridian 200 CD player	£895
Meridian 203 DAC	£560
Revox <i>H6</i> tuner	£834
Audio Research <i>SP14</i> preamp	£3,298
Krell <i>KSA 250</i> stereo power amp	£6,699
ProAc <i>Response III</i> loudspeakers	£3,069
Tara Labs <i>Quantum III</i> speaker cable	£432
Siltech <i>Digilink HF6</i>	£99
Siltech Interconnect	
4/56 (price per metre)	£485
Bespoke system cabinet:	£2,500

System supplied and installed by:

KJ Leisuresound, 26 New Cavendish Street, London W1. Tel: (071) 486 8262.

Cabinet made by: Clive Howdle of 9 Marylebone High St, London W1. Tel: (071) 224 6453.

system in mind. Two doors open to reveal shelving for the turntable and electronics on one side, with the Revox tuner and record storage on the other. A hinged lid gives easy access to the Linn turntable.

CDs are stored on a pull-out drawer of flip racks designed to hold 128 jewel cases which can be easily viewed and removed. The only drawback is that it cannot store box-sets of CDs.

Under the amplifiers perforated metal shelving allows cool air in at the front, with the shelves themselves slightly angled up to draw air out of the back of the cabinet. The constant flow of air should be enough to protect the wood from the Krell's notorious radiating heat sinks.

Improving with age

With the system off and cabinet closed the simple inlay of the doors give it the look of a bulky art deco sideboard; the only evident pieces of hi-fi are the ProAcs, whose elegant proportions echo those of the cabinet and also refer to the barn's oak beams, though it'll be 100 years before they are exactly the same colour.

Once installed our host noticed that some of the equipment took time to run in. This was especially evident with the CD player combination, he says, which now sounds "better and better".

A favourite time for listening is on weekend afternoons, after a morning spent working in the garden. "I usually turn the amplifiers on about an hour before I start listening to give them a chance to warm up." And what's the verdict? "I think the sound is completely out of this world. I find that I can even hear the difference between makes of piano," he enthuses.

"The Quads could never do this. I think a good amplifier is especially important; these amplifiers have made the biggest difference here, especially in handling the attack and reproducing the transients in music. I believe you really do need a lot of power in reserve. It makes listening effortless, like driving a big car at 90 miles an hour as opposed to a mini, where you really know you're doing 90."

It was surprising to learn that hi-fi is purely a weekend activity: "I don't need a hi-fi in London, I live there during the week and so midweek I go to concerts at the Royal Festival Hall, where I can get the real thing."

Here in this beautifully restored and luxuriously fitted barn it may not be quite the real thing, but the compensation of the surroundings, not to mention a refrigerated beer, makes it one of the most pleasurable attempts to recreate the real thing that we've yet found.

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ARCAM



British loudspeaker manufacturer Mordaunt-Short celebrates its 25th birthday this month. Robin Marshall, head of design, talks to Dan Houston.

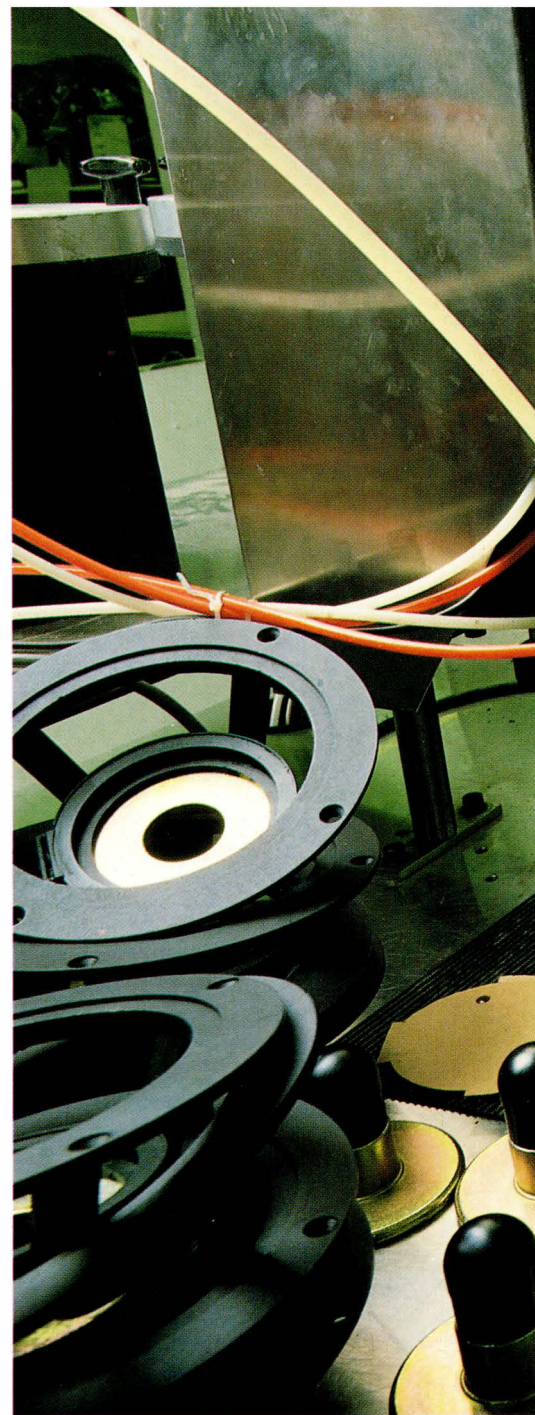
Marshall arts

The year was 1967, The Beatles had established psychedelia with *Sergeant Pepper*, Harold Wilson lived at 10 Downing Street and America was well on the way to a loss of face in Vietnam.

In the hi-fi community Dr Nakajima of Japan's broadcasting corporation had invented a digital audio tape recorder. In Britain Stanley Kubrick had used one of John Michell's *Hydraulic Reference* turn tables in his film *2001: A Space Odyssey*, after John also made the film's model spaceship, and another firm, Bowers and Wilkins was establishing the growing market for specialist hi-fi speakers alongside established companies like Tannoy, Celestion and (the late) KEF. It was a time when loudspeakers were seen as the most important link in the audio chain.

Norman Mordaunt, ex-Tannoy and Decca, was looking for a commercially aware partner to expand the manufacture of his existing eponymous designs. Rodney Short was manager of the hi-fi department in London's prestigious department store, Harrods. And Robin Marshall had just joined the BBC engineering department because he wanted to make a living after five years as a session musician and moonlighting in R&B bands around Paris.

The first Mordaunt-Short loudspeaker was the *MS100*, sold at the M-S shop in Fulham. The real wood veneers and superior finish of the early models, as well as the use of Decca's ribbon tweeter, established the firm's reputation and 'in-house' production was set up at Petersfield in Hampshire in 1970.



By 1973, when Mordaunt-Short was suffering the full effects of the first oil crisis and the attendant recession, Robin Marshall had decided that the labyrinthine confines of the BBC were not for him. He left, and joined John Reid's expanding empire of five KJ Leisuresound shops and became involved in the newly set up Audiomaster company. His work there came to an end with the collapse of John Reid's empire and in 1980 Robin Marshall moved to Monitor Audio, in Cambridge.

He spent two years there designing speakers like the *R352* and the *MA800*, which was one of the first major British aluminium dome tweeter designs. In 1983, while still working as a consultant on the *MA800*, he founded Epos and soon de-

May the workforce be with you. Robin Marshall and the Epos team.





signed the famous *ES14* loudspeaker which also used aluminium dome tweeters.

Metal dome tweeters have become the flavour of the decade for speaker design, but curiously Marshall says he doesn't favour the dome tweeter design at all. "Out of choice I would prefer a cone design of tweeter, but manufacturing cost and marketing dictate that even the Epos has dome tweeters," he explains. "A cone tweeter would cost more — it would probably put £50 on the price of the *ES14s* — but it would have better dispersion and directional qualities than the dome."

The year 1983 also saw major developments at Mordaunt-Short, where Chris Short was now solely at the helm. The *MS20* loudspeaker, finished — shock, horror — in black ash vinyl was the first to bring the company into the mainstream and was soon joined by the *MS30* and *40*,

Pull yourself together. Epos speaker components receive personal attention.

largely designed by Michael Deadman's new colleague Phil Ward. The company wisely kept its esoteric designs, with the revived *MS100* and *MS300* receiving critical acclaim to reflect on and boost the budget side of the business.

When Chris Short started looking for a small loudspeaker manufacturer with a reputation for esoteric excellence, he also needed a designer to build on the M-S reputation for consistency and performance. Epos proved ideal, and Robin Marshall was a willing candidate.

"Chris Short approached me, and I think it was probably because I was the cheapest person he could find! In order to employ me as a designer he had to buy Epos, which was OK for him because we had established such a niche market. We

had 20 dealers and Mordaunt-Short had 500. He was able to buy us with petty cash."

Marshall began commuting from Hertfordshire to Hampshire, where M-S was based in a gorgeous rural setting at Durford Mill near Petersfield.

When he joined, Marshall began work simultaneously on the M-S *Series 3* range of loudspeakers and the second Epos loudspeaker, the *E11*. These resulted in a Queen's Award for Export Achievement in 1990 shortly before the departure of Chris Short.

With the recession biting and the original ethos of TGI being to share resources, manufacture moved to Horndean and latterly to Havant, to the site of the Goodmans factory. Marshall and his design team of Andrew Whittle and Gary Mardell were still getting organised there during our visit.

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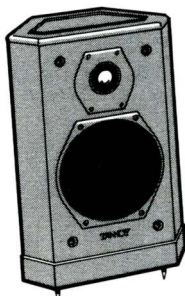
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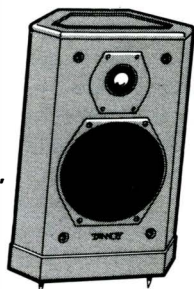
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THE CRAFTSMAN

While Epos represents only a fifth of M-S's business, Marshall seems more attached to it than the mass produced boxes of the parent company.

"The *ES14* is an inside-out loudspeaker," he explains. "Most loudspeakers have a 12 or 14mm long voice coil working in a magnet that has perhaps a six millimetre gap. The *ES14* uses a short coil, about six millimetre long with a much larger magnet gap, about 15mm. This means that whenever the coil moves up and down in the gap the magnetic flux remains constant over its (the coil's) width. If you can keep the effects of magnetic flux the same over the whole coil then you can achieve a much more linear system. With that you get a much more open and sweet sound, especially in the midband.

"The reason most companies don't do it is because it's more expensive to make; in the case of the *14* the magnet costs three times as much as a complete bass driver in an average loudspeaker."

The £330 *ES11* uses a cheaper design of magnet but is nevertheless good enough to have earned a Federation of British Audio award this year. The Epos speakers are very different from the M-S designs, requiring careful matching to amplifiers, while the M-S speakers are less demanding or dependent on the rest of the system, according to Marshall.

Havant a care

The Epos *14* and *11* speakers are now handmade at the Havant factory; the cones for the mid-bass drivers are all glued together by hand and batches of six are assembled and tested by a small but committed team, who don't work to the rigorous schedules of the M-S production line. All connections are soldered, whereas the mass market boxes of Mordaunt-Short travel along a conveyor belt and use spade connections internally. Here something as esoteric as soldering would be a disaster, according to production engineers.

Even so, Mordaunt-Short product looks handcrafted compared to the 700 drivers per hour capacity of the Goodmans assembly lines next door.

To celebrate its silver jubilee this year, M-S has relaunched its budget *MS3.10* (£100) loudspeaker complementing the *Series 5* range priced from £120 to £400. The company also manufactures the *Classic 20* and *Classic 40* loudspeakers at just under £400 and £600, which carry on the early wood veneer finishes and a degree of audiophile craftsmanship.

With rigorous price constraints, a five year guarantee, and 50 per cent of product being exported, the *Series 5* speakers are very different from the Epos models which are purely engineered by Marshall.

One of the main engineering bugbears has been achieving consistency in an equation where a certain number of drivers have to be produced in a certain time.

"We now use an injection moulded cone surround which reduces the problems caused by gluing cones by hand," Marshall explained. "This is particularly relevant to the Far East where we know our speakers sometimes travel in temperatures of 60 degrees Celsius. Even if the cone doesn't fall apart, that kind of temperature can affect performance when you're shipping by the container-load.

South shields

"We've also introduced shielded magnets to cater for audio visual systems.

"We've been able to do that partly by using plastics, which can be moulded exactly into the geometric shape you want."

Marshall says his design philosophy is one of simplicity: "If you need a complex solution to a problem then you should go back to the previous stage," he advises. "A complex crossover means that your drive units are flawed. Every first step should be right because it's no good building on shaky foundations. I feel that what you can leave out is always more important than what you can put in." The crossoverless Epos designs still need a single capacitor to protect the tweeters but he is hoping to do away with this in the future.

He also describes the rectangular hi-fi



Some hi-fi speakers cannot be placed near a television set because the magnets pull out the screen's colour bands. It's a useful selling feature, and the video magazines are picking up on it now."

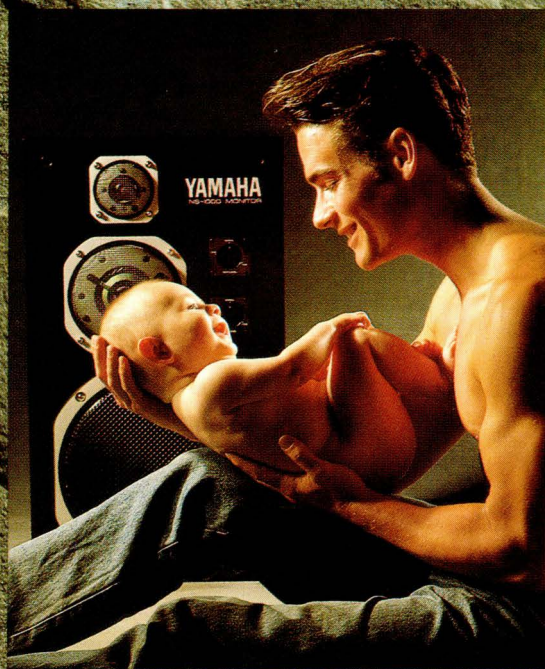
Marshall has brought much of his Epos ethos to M-S, such as doing away with the crossover: "Conventional wisdom in any two (or more) way system is to design your drive units and then work on a crossover to cater for them.

"But why not design the drive units so that they work well in the first place? Then you'll find that the crossover can be engineered out, which will reduce the amount of electronics and improves the signal path. It's difficult to do this because you have to manipulate things which are mechanical, and it's always easier to manipulate the electronics; that's why crossovers are used. But on some of our *Series 5* speakers we have done away with the crossover altogether.

speaker box as "quite the worst possible shape for drivers to work in." The boxes' size and shape are dictated by the market, and marketing departments; his job as a designer is to make the best of a bad deal. "I think the best shape would be something like a tube. If you could put the drive units onto the front of a tube you could reduce the resonance factor. We have now got to the stage where the box shape is holding back the drivers' performance, and the box contributes more than anything else to the character of a modern loudspeaker. The most important criteria of design should be accuracy and transparency."

It's a pity that an industry in recession cannot allow engineers like Marshall free rein. A new shape of loudspeaker would radically change accepted notions of what all hi-fi should look like. There must be music lovers neither too mordant, nor short (of cash) to buy that concept.

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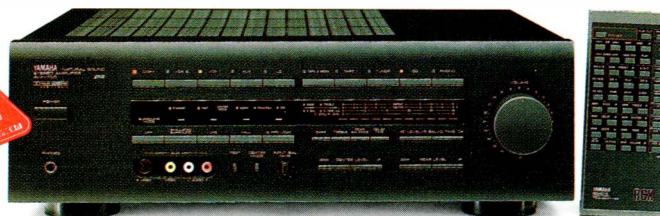
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A certain ratio

Every once in a while something comes along which is radically different. And it only takes a glance at Philips 8906 TV set to realise that this is indeed a radically different TV. While the size of the screens continues to get ever larger and all sorts of digital widgets make their small screen debuts, the basic shape of TV pictures has stayed roughly the same ever since the humble cathode ray tube made its domestic debut.

TV sets all have an aspect ratio of four by three, or to put it another way, the TV picture is only about a 1.3 times as wide as it is high, hence the popular expression of getting square eyes if you spend too long watching the soaps.

The reasons for this are two fold; first, in the Twenties and Thirties this was the shape of the image seen in the cinema, and second, it's much easier, from a technical point of view, to produce a cathode ray tube with a square picture area (it's even easier to produce one with a round window but this wouldn't be a lot of good apart from for the odd scene from *Playschool*).

However, as any cinema going reader will know, things have come a long way since the Twenties and Thirties and just about anything you see on 'the big screen' will now also be seen on a wide screen. The exact ratio varies from film to film, depending on which camera system was used to produce the film stock in the first place, but the popular Cinemascope format produces a picture which is some 2.35 times wide as it is tall.

Bring it on home

All of which produces a bit of a problem when you come to watch the latest cinema blockbuster from the comfort of your own armchair. In order to be watchable on a conventional TV screen, the films have to be converted to the four by three aspect ratio. The problem here is that you can't just cut off the edges as this might result in a crucial scene or character being

omitted from view. To get around this a process known as 'pan and scan' is used whereby an operator sits down in front of the film and selects the area that will be recorded onto the video tape master, placing the frame according to where the action is taking place on the screen. Obviously this isn't perfect and can give some strange results, particularly where a director has used the full width available via the cinema camera.

All of which brings us, albeit via a rather circuitous route, to Philips' new 16 by nine TV. In a nutshell, this is a telly with a stretched screen, with the width being some 1.8

times the depth.

The monster I got to play with for a couple of weeks is quite simply the biggest TV set I've ever had at home, with a screen measuring a massive 86cm across (that's nearly three feet in the old money) and all housed in a huge cabinet along with enough audio equipment to build a decent midi system were it ever liberated from the confines of the TV enclosure.

Count those features

Before going on to the widescreen aspect itself, it's probably worth noting down a couple of the more conventional features provided by the set.

A nice touch is the provision of two remote controls, a simple little wand type thing with which the technophobic can perform simple tasks such as adjusting the volume and changing channel, and a rather larger art deco device reminiscent of the foyer of a Thirties Odeon within whose folding flaps you'll find enough buttons to keep even the most ardent knob twiddler happy for months.

The picture-within-picture facility is provided with its own tuner so you can keep an eye on what's showing on the other channels, while the colour coded Fastext facility makes finding out what's on tomorrow and checking the weather a relatively easy task. The TV functions

Resident couch potato Andy Benham gets more than his aspect ratio stretched after a week at home with a Philips widescreen TV.

themselves can also be controlled using the colour coded keys and a series of on-screen menus, which only take a couple of minutes or so to sort out.

Connections are provided a plenty with twin SCARTs and no less than three S-VHS sockets augmenting the NICAM equipped onboard tuner.

The widescreen experience

Seeing as the set was due to be shipped on to *Tomorrow's World*, there was no time to lose. A quick trip to my local purveyor of high quality videos to the masses yielded up no less than seven feature films including *Terminator 2*, *Predator 2*, *Backdraft* and the obligatory wide screen tester, *Dances With Wolves*. To these were added various other titles on Laser Disc including *Top Gun*, *Blade Runner* and *Aliens*.

By three o'clock the next morning my only comment was 'Wow'.

Basically this product offers you two choices: to watch a film in the conventional four by three aspect ratio, or to expand it out to 16 by nine by zooming in on the existing image. After a couple of seconds of four by three the set was switched over to 'movie expand' where it stayed for the next week or so.

As previously mentioned, when a film is transferred to video you lose a lot of the edge information and the TV merely expands the picture to fill the wide screen, so you don't get any extra information, but the picture you do get is nothing short of superb.

Dances With Wolves is such a panoramic spectacle in the first place that it should really be obligatory to watch it on a 16 by nine TV as it is so much better. Likewise with *Aliens*, *Backdraft* and just about anything else you care to mention.

By blowing the screen up you do lose information top and bottom but this is more than compensated for by the sheer sense of scale the widescreen format is capable of purveying. Even the aforementioned *Dances With Wolves*, which was the only film I was able to that had any subtitles on it, worked very well in the expanded format and the subtitles were well clear of the bottom of the screen.

The picture area which is cropped, both top and bottom, is not actually lost. It can be retrieved from memory and you can move the picture up and down if you do

get any problem with subtitles disappearing off the bottom of the screen.

This ability to scroll up and down is also quite a benefit with the so called 'widescreen' videos which are appearing, for example *Lawrence of Arabia*, *Die Hard* and the *Star Wars* trilogy. Here the picture is presented in its original width with black bands top and bottom. Switch over to widescreen mode on the TV and the picture expands to fill the screen, although there can still be thin black bands both top and bottom depending on the tape or disc.

Funnily enough, wide screen videos didn't work quite as well as normal four by three videos, because by expanding the picture you crop out the edges, paradoxically leading to many of the problems that can occur when you transfer a video for four by three presentation.

Watching live transmissions, the expanded format worked brilliantly with feature films and quite passably for most other material, although with all the talk-

ing head type programmes in the run up to the election, the cropping of both hair and chins left a little to be desired.

Picture quality, from both tape and disc, was very good indeed, although the sheer size of the screen meant that you had to sit quite a distance back from it to get the best effect.

This set is also one of the first to feature 100Hz technology, whereby the picture is refreshed at twice the normal rate, thereby reducing flicker, and this facility certainly seemed to work as advertised. Considering the huge picture size the image was certainly remarkably stable.

Completing the system

The TV comes complete with an in-built sound system including detachable stereo speakers and a sub-woofer built into the case. There is also an add on bass plinth but, quite frankly, I find it amazing that Philips should be offering this sort of set without a Dolby-Pro Logic set up to go with it. If you are spending £2,500 on

what must be one of the best home theatre sets around, it seems mad to practically ignore the sound side of things. OK, so it's taken 60 years to change the shape of the TV picture but Dolby Stereo has been established for quite a while now and is an ideal partner for the large screen format.

I used the set with my current reference Dolby Pro-Logic unit, the marvellous Yamaha A1000 and stuck with my normal TV sound source, namely an Arcam NICAM decoder. With these units wired into place and using the Sonolith speakers (reviewed last month) as the main sound providers, augmented by no less than four surround units, the sound was worthy of the picture.

No doubt there are video purist out there who will tell you that there is no reason to buy a 16 by nine TV as there is no 16 by nine software available at the moment, but I think that is missing the point. Leaving aside the fact that BSkyB is considering a 16 by nine service, the sheer fun to be had from 'normal' cassettes and discs makes this one of the best AV toys I've ever played with. When the 28 inch unit reaches the shops later this summer, priced at a more financially acceptable £1,300, I'll start saving the pennies. Going back to my mere 35 inch set was like going back to a rack system after living with a *Rock Reference*.



Top: the widescreen (16 by nine) format. Middle: as seen on a conventional (four by three) TV. Bottom: as it would have appeared in the cinema. Note that the middle image has been selectively 'panned and scanned'.

DCD - 1290 COMPACT DISC PLAYER

The Denon DCD-1290 compact disc player, is a superb performer by anyone's standards.

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But as they say, hearing is believing. So call into your local dealer.

And sound it out for yourself.



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WHAT HI-FI, JUNE 1992

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AUDIOFILE, JUNE 1992



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To enter the Michael Jackson free ticket competition, just complete the following questions, writing your answers in the space provided on the entry form.

1. Name Michael Jackson's recording label.
2. What is the name of Michael Jackson's latest album?
3. What are Sony UX Turbo tapes especially designed for?
4. Who is sponsoring the Dangerous world tour?



Five pairs of Michael Jackson concert tickets to be won

This month we've got together with our friends at Sony to offer you the chance to win free tickets to the Michael Jackson Dangerous world tour concert at Wembley stadium on the 30th of July.

The competition is being run by Sony in association with Pepsi, and, as well as the concert tickets themselves there is also the chance for you to drink Pepsi to your heart's content, absolutely free.

Pepsi, who are sponsoring the Dangerous tour, have got together with Sony (Michael Jackson is on the Sony Music label, clever eh?) to bring you free Pepsi, should you be unlucky enough not to win the tickets. All you have to do is buy one of the specially marked packs of Sony UXS, UX Turbo, VHS or Video 8 tapes and you will get up to £4.50 off multipacks of Pepsi, Diet Pepsi and Caffeine free Diet Pepsi.

UX Turbo tape should be familiar to

readers of *Hi-Fi Choice*, after all we gave you a free one with the October issue, but for those of you who missed it (back issues are still available!) UX Turbo is a super chrome position tape especially designed for in-car use and enclosed in a heat resistant, rigid welded shell to withstand the rigors of mobile usage. The labels even use a special adhesive to prevent them peeling off inside your cassette deck!

UXS is a super chrome position tape with the lowest bias noise level of any Sony tape and is especially suited for recording digital sources.

So, even if you aren't lucky enough to win the concert tickets, you can always drown your sorrows with a free can of Pepsi!



Sony UXS



Sony UX Turbo

Entry Form

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HFC/JULY/92

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Your answers:

- 1.....
- 2.....
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DRS - 810 3-HEAD CASSETTE DECK



BRITISH HI-FI
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WINNER

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We'll come right out and say it. The Denon DRS-810 is a simply outstanding deck.

A "smooth operator", as one critic put it.

The reasons are very clear.

Take, for instance, the horizontal tape loading mechanism. With

our improvements to the transport flywheel, the three motor, dual capstan transport reduces wow and flutter to 0.055% wrms.

And if less wow woos you, the DRS-810's precise clamping of the cassette with its ceramic

stabilizer, (which reduces vibration and modulation noise), will be music to your ears.

The uniquely stylish DRS-810, however, is not all front and no substance. It's three heads are mounted in high precision aluminium die cast head bases to absorb vibrations and effectively suppress modulation noise. We've replaced conventional preset tuning with a bias fine adjustment control. We've added a record return function. A music search system. And a newly developed Dolby IC design to further enhance it's Dolby B & C and HX Pro.

It all adds up to a system that is, by anybody's standards, a smooth operator. In fact, when it comes to sound quality, the Denon DRS-810 is not only outstanding.

It's got it taped.

What the press say

"The DRS-810 replays with delightful sound quality, both with recordings and with pre-recorded tapes."

HiFi WORLD, JANUARY 1992



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Gerrards Cross, Buckinghamshire, SL9 9BS.

21st Century Fox

Please let it be known that I am sick to death of the childish squabbling between the DCC and Mini Disc factions. The rumour-mongering and reports of who said what about what and whom have now descended to kindergarten playground levels.

During the recent London trade shows I was being quoted as having tried to put an analogue cassette into a DCC deck on the Philips stand, and failing to do so. I did not try any cassette, in any machine, at any exhibit.

Demonstrations of Sony's Mini Disc have so far been a fudge. The 'MD player' has been a modified Data Discman CD-ROM player, which does not record and is playing back a disc which contains only a short section of sound pre-recorded using a very early ATRAC coding. By the time you read this we should have heard a working demonstration of the final ATRAC coding system to be used by Mini Disc. The first demonstrations of recording will be at Chicago, in late May and Salzburg in mid June.

Barry Fox assesses the chances of a full scale format war between the multi-nationals backing DCC and those pushing Mini Disc.

So will there be a format war?

Earlier this year I asked Jan Timmer, Head of Philips, what he thought was going to happen:

"You know that I have always fought against standards battles," said Timmer. "I would not want ever to be involved in another one. But if this is what the customer wants, and if this is what the music industry wants, then . . ." he shrugged, signifying weary desperation at the prospect of a DCC-versus-MD war, "I give up. I am afraid to put so many standards in front of the customer. But if the market decides differently, we'll just have to see."

A few weeks ago I asked Akio Morita, founder and Chairman of Sony, the same question. "We are not in a format war" argued Morita. "If the market is ready to accept DCC, we may also come out with it — especially the software, which is system-independent."

"I think the customer should have a wide range of choice. For example, people can choose between a sports car, VW, convertible, all kinds. The customer is not confused. He has his own choice. Our policy is that we should give a much wider choice to the customer.

"Some people still like to use tape. We have no objection. Some people will want to use CD which has the advantage of random access. I prefer CD, because I can select tracks. It will be the customer's choice. We will never force our customer to choose one system.

"Maybe DAT will be just a professional format like 34 inch U-Matic video tape. Maybe the general public

will use Mini Disc. It's OK. We shall give a wider choice to the customer."

But surely, whatever Akio Morita may say about there being no format war, the trade and public will perceive it as just that? Can MD, DCC, DAT and CD-R all survive?

"Maybe for a while they will survive together. Finally the customer, the general public will choose one of them or two of them.

"We would of course prefer to have one standard. However, from our point of view as a software manufacturer, we are willing to make our software available on any standard. So we do not have to have a single standard."

So one of the advantages of Sony being in the software industry is that Sony wins either way?

"Yes, that is why we are in the software business. And as a hardware manufacturer we don't stick to one format. We are willing to make any format, just like video. We are still making Beta, along with VHS and 8mm. If necessary, if DCC is OK, we are willing to make it available, along with MD and CD."

Just before meeting Morita, I had been to a retailers' conference organised in Torquay by trade body RETRA. At the conference Kodak was plugging Photo CD. And Kodak confirmed the price to be charged for transferring a snapshot's photographs from film to CD when the system is launched in the autumn. The Photo CD Centre will sell the customer a blank disc and then charge 40p or 50p per shot transferred to the disc.

The Photo CD blank disc is of the dye-coated Write-Once type made by Taiyo Yuden for use with professional CD-R machines, like those sold by Marantz/Philips. Professionals must pay £20 or £30 per blank. Kodak has all along been saying it will both buy in and manufacture its own blanks, in quantities large enough to make the price of Photo CD transfer affordable.

And at Torquay, Kodak confirmed the retail price which Photo CD Centres will charge for a blank, just £4.99 including VAT.

The moral is obvious. If Sony and Philips confuse the public with a standards battle between MD and DCC, someone will step in with a low cost CD-R machine which can make a digital dub of a CD for one half or one third the price of a pressed disc.

Will Sony have its hands full launching Mini Disc in the face of DCC?



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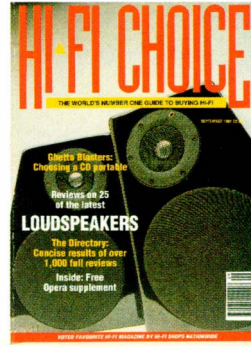
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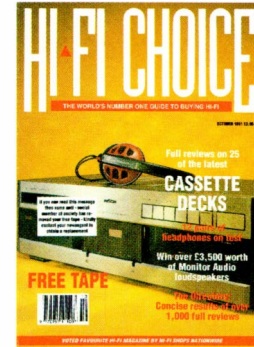
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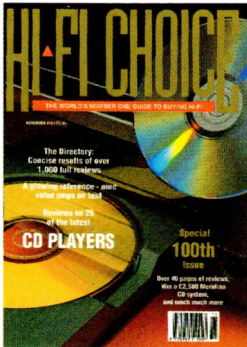
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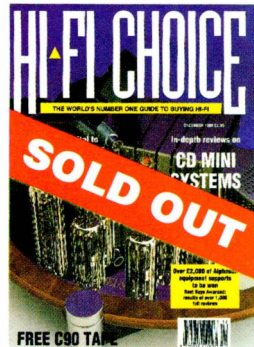
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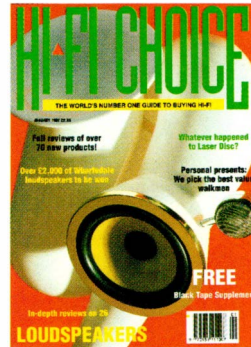
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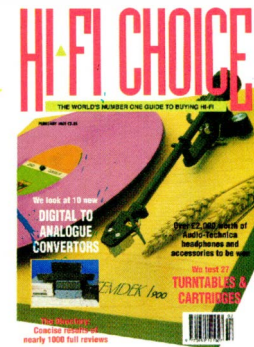
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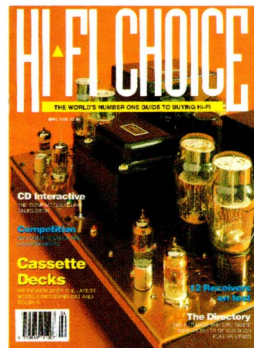
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Readers Write

CHOICE ANSWERS

Shirt shaking bass si'l vous plait

I am planning to upgrade, or rather, completely replace my current system which, dare I admit it, was bought with little forethought one Saturday afternoon seven years ago.

I'm after a powerful system which can deliver plenty of level, shirt shaking bass and clean treble. Given a budget of four to five thousand I have compiled the following shortlist; Meridian 206B, Pioneer PD-91 and Rotel RCD-965BX CD players, Systemdek IIXE/900AP/Rega RB300/Goldring 1012 record player, Pioneer CT-93 tuner, Hafler SE120/XL-600 pre/power amps and, er, well, I'm not sure which speakers, but someone suggested KEF Q80s.

What do you reckon?
John Maccariello, St Albans, Herts.

Four to five K for shirt shaking bass doesn't seem like such a tall order and your shortlist looks like it's heading in the right direction, though the results of last month's CD player reviews would suggest that you investigate either a transport/DAC combo or one of the sub £500 CD players that are recommended in the Directory (see Kerry McIntosh's letter on the opposite page) rather than the somewhat dated Pioneer PD-91.

Speaker-wise there are plenty of options but they are quite expensive; the TDL Monitor (£1,799) and Castle Winchester (£1,400) are floorstanding transmission line models that really plumb the depths, whereas the Yamaha NS1000M (£900),



Want bass to frighten the horses? Try the JBL XPL200s.

JBL XPL200 (£2,000) and Audio Note AN-E (£1,300) are more conventional boxes of the bitchin' variety.

Listen to a few of these with dealer recommended ancillaries

as well as those you've mentioned. Once you've heard a few systems you should be able to get an idea of which direction you want to go in and hopefully end up with your flares flapping!

Bass extension but not too much

I'm in the process of doing some serious system upgrading. So far the set up includes an Arcam Alpha CD player, NVA AP35 amp and Mordaunt Short MS3.30 loudspeakers on Target frame stands. The NVA and Arcam are both brand new, but the speakers are fairly old and I don't think they are doing the system justice.

I want some dynamic, exciting speakers with plenty of bass extension, as long as it's well defined. So far I've considered the KEF Q80s; I'm a little concerned, however, that

the KEF's wall shaking bass combined with the low frequency power of the Alpha will be a little overwhelming.

Could you perhaps recommend a few other loudspeakers at this sort of price and also some decent cable to go with them (at present I use QED 79 Strand, surprise, surprise). Benjamin Robinson, Portsmouth, Hants.

I don't know if you have seen Choice's assessment of the Q80, but if you check the Directory you'll see that it could

have fared better. I understand your reservations about bass control but there are several good speakers that will give you what you want and not be tempted to boom. Our strongest recommendations are the Castle Chester (£599) and the Epos ES14 (£449). Both, of course, need to be auditioned in the context of your system but they are capable of results that will make your CDs get up and boogie.

As far as speaker cables are concerned, why not peruse this month's free supplement?

Mozart appreciation options

My present system is based around an Audio Innovations Series 300 amplifier, with a Marantz CD40 CD player and a Rotel RT950BX tuner providing the inputs. The speakers are homemade and of rather dubious quality; they are supported by Foundation Fred stands and I use Furukawa interconnects and speaker cables.

The loudspeakers need upgrading, but as a poor student it has taken a while to scrape together enough money to get something decent. Working on the principle that I need an efficient loudspeaker, my choice seems restricted to models like the KEF Q80 or the Audio Note AN-K.

Both these would seem to suit my taste in music, which covers the likes of Chris Rea and Dire Straits but I do appreciate a bit of Mozart while writing essays. Are either of these speakers the best option or can you suggest anything else? I had also considered buying secondhand, what would you suggest for a £500 budget?
James Smith, Aberystwyth, Wales.

You're right, with only 12W to play with you are going to need a speaker with a minimum sensitivity of 90dB, which, though not that easy to find, is quite a desirable thing from the point of view of dynamics and effortlessness. Of the two models you mention, the Audio Note, which is of course more expensive, is probably the best match to your amplifier. It is also a very natural sounding speaker with excellent timbral resolution and dynamics, which comes in handy with all types of music, especially the acoustic variety.

Apart from the Q60 (£350) and models like JPW's AP3 (£225) and the Tannoy 609 (£250) there aren't many alternatives in the sub £500 arena, and secondhand models might be worth considering if you want bigger boxes for your money. See if you can find a Snell JII or one of the SD Acoustics models, KEF, likewise, has made some efficient models in its time as has Yamaha with its NS1000.

Upgraded into a brick wall

Over the past few years I have gradually upgraded to a reasonable system, but have come to a brick wall as far as the next upgrade is concerned. I have a Marantz CD65BX/Arcam Black Box 2 Disc playing system, Cyrus I amp and a pair of Monitor Audio 352MD loudspeakers.

If I go for a new amplifier should I look at a Musical Fidelity A100 or perhaps an Audio Innovations Series 400? Or should I go for a better CD transport? Or a bitstream convertor such as Meridian or Deltec?

Please help me find an escape from this confusion.

Julian Hart, Sanderstead, Surrey.

I see your problem; nothing in your system is better or worse than anything else, so there is no logical upgrade route apart from working on replacing the whole lot. If you do this over a period it shouldn't prove too painful financially and will gradually bring the sound of your CDs onto a higher plane.

I would suggest you go listen to a few systems that cost around £2,000, and see which ones appeal. Try Arcam's latest transport, the 170.3 (£650) and



This month's Mission appears to be a Cyrus II.

the forthcoming Black Box 5 DAC, or alternatively get the Marantz Deltroned (about £400) and use it with a Deltec DAC. Both these combos are equipped with a comms link that enables transport and DAC to run off the same clock, giving them a theoretical advantage over conventional transport/DAC set ups. Or try one of our favourite combos like the Meridian 200/Audio Alchemy DDE (£1,271).

Amp-wise we haven't tried the

current MF A100 and the Series 400 is a bit of a rarity these days, but we'd suggest you listen to combos like the Pioneer A-400 (£240) with Audio Note AN-Js (£799) or Ks, and the Cyrus II (£380) or Audiolab 8000A with Castle Chesters (£599).

Once you've decided on the goal that you are after, start upgrading front to back through the system, and one day, with luck, you too will have reached Nirvana.

A CD player for the children, please

I have a system consisting of a Linn LP12/Akito record player, Bryston 1B/3B pre/power amps and AR II loudspeakers and want to purchase a CD player, which would be more

convenient for my children. I have shortlisted the Meridian 206B and Pioneer PD-75, but the latter is considerably

cheaper over here.

Is the Meridian that much better?

I also want to upgrade the speakers and am considering the Castle Chester, Epos ES14 and Kaber LS500. Do you know if the mark two version of the latter is a great improvement, and which would you recommend?

Kerry McIntosh, Auckland, NZ.

If you've seen the June issue (107) you'll know that neither of the CD players you mention were considered to be particularly good value for money. There are less expensive machines that are capable of achieving similar and some-

times higher sonic standards making it very difficult to recommend (admittedly physically more attractive) beasts such as the PD-75 and 206B. If you want physical substance then transport/DAC combos seem to be the only worthwhile route, but they are rather dear. If, on the other hand, sound quality is your highest priority then star players like Rotel's RCD-965BX (now £320) and to a slightly lesser extent the Marantz CD-52SE (£280), NAD 5425 (£200), Pioneer PD-8700 (£300), Sony

CDP-X339ES (£450) and Technics SL-PG520A (£223) are what you should be considering.

Speaker-wise, the Castle and Epos you mention are both big Choice favourites, the latter being particularly well suited to the LP12. But the Kaber, in presumably Mk1 form, that we reviewed failed to inspire the listening panel and subsequently wasn't recommended. Therefore your best plan would be to listen to the other two and find out which one best suits your taste.



Need to appease the kids? Try a Marantz CD player.

Warm, sweet, tight and deep

I currently own a Marantz CD80 CD player, Musical Fidelity A100 amplifier and Alphason Artemis loudspeakers. I want to purchase a new CD player and have £1,600 to spend. So far I've had recommended the Meridian 200/203, 200/Deltec Bigger Bit and Micromega Solo. However, I'm told that the Meridian hardware tends to be too laid back.

What I'm looking for is warm, sweet treble with tight, deep bass and plenty of detail. I must confess that I'm looking favourably on the Micromega; what are your recommendations?

James Kavanagh, Belfast, Northern Ireland.



Transporting the goods: the Meridian 200.

So, you want warm, sweet treble but you don't want laid back sound. I guess it might be possible, but whether it can be done digitally for £1,600 is another question.

Looking through past transport/DAC reviews it seems that this may well be a bit of a tall order.

What you are going to have to do is listen to some of the alternatives and see which one suits your tastes the best. On the transport side there seems to be little competition for the Meridian 200, though Micromega's Duo CD3 (£1,000) which Choice hasn't tested could well be worth a listen. However, DAC-wise there are several viable options starting with Meridian's arguably laid back 203 (£510) and also including the Duo BSII (£500), Woodside DAC2 (£510), Deltec Bigger Bit (£650) and Audio Alchemy Digital Decoding Engine (£376). If none of these quite make the grade, then I'm afraid you'll just have to keep saving!

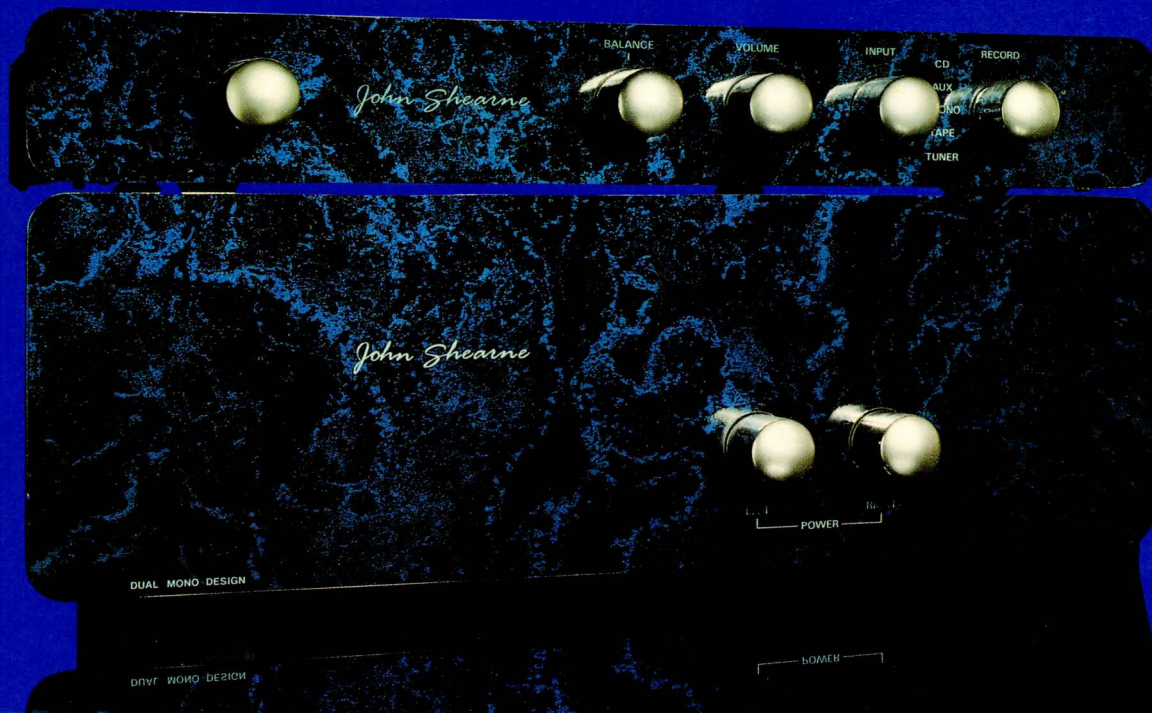
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Write on . . .

What do you think about the way things are shaping up in the ever broadening world of audio entertainment? We want to know your views and ideas, so send 'em in and each month we'll award a record token (which should just about cover the price of a CD) to the writer of the most witty or interesting contribution.

Upgrading your transistor radio into the bathroom

In your February issue Daniel Schar said, "With LPs music lovers had a sort of ceremony, taking the LP carefully from its sleeve, putting it on the platter," and says that with CD "there is no mental preparation for the pleasure of the music." Mon dieu! My mental preparation for listening to music is a day's work, and if a CD player, with all its convenience, could provide a satisfying experience I would look no further.

But through my recent upgrade from Dual 505-3 and Rotel RCD 55 sources to a Systemdek IIX 900 I can now appreciate the gap between the sound reproducing potential of CDs and records. I am not sure whether it is possible to

measure the actual bits per second being reproduced by any of the above equipment but the Systemdek does seem to give me more of the recorded sound and

perhaps it is appropriate that our ears are the final judge. I wouldn't call the extra sound provided by the Systemdek 'detail' but greater presence and thus realism. Many artists have risen in my estimation



Yours for the price of 17 CDs: a Systemdek IIX 900.

because I now get a much fuller view of what they are doing, and how really good they are. Are the record companies and artists aware that a sizeable portion of their performances cannot reach listeners through the medium of CD?

I tried CD but fortunately the price of the discs made me consider a better turntable and continue the hunt for vinyl. It's grotesque to think that if CDs had been the same price as records I might not have

discovered the Systemdek, nor rediscovered my record collection.

CD sounds as good as, or better than real budget turntables. It cannot match good, or even relatively modest turntables.

The Dual and Rotel now provide good sounds in the kitchen, where their convenience comes into its own; and the transistor radio has now been placed in the bathroom. Mark Wilson, Bristol.

Perfect sound forever?

In the past year I have been reading with interest about the battle for the new digital music format. I can understand why the record companies are concerned about software piracy but one thing that does concern me is the SCMS copy protection system.

The move from analogue to digital is becoming a reality, and personally I feel that this is not entirely a bad thing, but if we are all to change our recording methods, we might end up in a pickle in 15 to 20 years' time. For example, I'm in my early twenties now. When I'm in my forties solid state recording media may be the latest technology. If DCC is a success now, how will I be able to convert all my SCMS protected material into the new format in the future?

The day will come when DCC is antiquated and nobody will provide support for the equipment. This in itself isn't a problem to me; I'm all for innovation. However, it will leave me no choice but to take the recordings in my collection from digital to analogue and then from analogue back to digital to get my most treasured stuff on to the latest recording medium.

How can we keep legitimate recordings for a life time without losing quality? Will I have to go through this digital-analogue-digital rigamarole again when I'm 60?

Stuart Johnson
Weybridge.

I'm not sure that solid state memory is as much as 20 years off, or whether your DCC recording could survive that length of time without damage or deterioration. But in any case it's not that difficult to buy a unit that can outsmart SCMS protection. This sort of technology exists in the same sort of legal grey area as 'fuzz buster' boxes for your car which warn of police radar traps.

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DCC: Spooled for choice

As the ordinary compact cassette has shown, a spooled tape deteriorates with time and repeated play.

Coupled with the lack of convenience features such as near-instant track access, and with the major question of sound quality still unanswered for production standard DCC, I cannot believe that the public in

general would be prepared to pay the same price for a DCC as CD. It certainly would not be worth it.

But on top of this, the CD itself is not worth £12 — and £13 seems to be a more widespread price now.

Yet in the United States, I believe a premium price CD sells for about £8 — and consumers' associations are fighting to bring

that down.

Let's face it, we the CD buying public are being ripped off. A large number of CDs may well be sold, but how much larger would that number be if prices fell? I am sure most people would spend the money they saved on more CDs. I know I would.

Aidan Gill
Cambridge.



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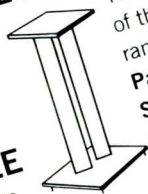
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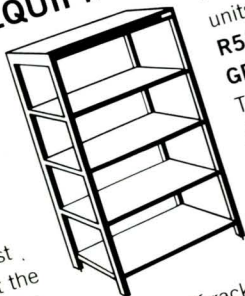


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Choosing and Using . . . Separates Systems

The system tests that follow centre on various permutations from a pool of 18 components, the majority of which have been awarded Best Buy status in recent issues of *Hi-fi Choice*. Starting with highly recommended products sounds like a good stepping off point for any system, and plugging a Best Buy into a couple of other Best Buys should guarantee audio nirvana.

It doesn't though. System design is not an exact science, not least because the way system components interact is not always easy to predict. Individual systems may cope well with the special demands of rock, jazz, or some types of classical material, they may produce extended bass or high maximum SPLs. But rarely will one system do all of these things. They tend to be good at certain things and less good at others.

Link up three Best Buys and audio Nirvana is yours. Or is it? Alvin Gold reports on the voodoo science of system building.

Considerable emphasis in the tests that follow has gone into identifying where these strengths and weaknesses lie: whether each system is suitable for large or small rooms, for particular classes of music, for parties or for background listening and so on. In the end, however, there is always an element of subjectivity, and the shape of your system should be chosen by you, in consultation with a good dealer, using reviews to help draw up a shortlist.

The fact that there were four CD based systems and two built around record decks suggests a possible subplot to this project. Is this yet another soul searching debate about the relative merits of analogue versus digits? Not really. That discussion is now largely academic, and in practice the choice should be made on pragmatic grounds. But let's rehearse briefly just what those grounds might be.

It hardly needs explaining that as a source of newly recorded material, records are now a dead loss (although do take a look at the Polygram news story—Ed). If you're happy to restrict your attention to chart material, you could just about manage with records, but the rest of us will find slim pickings in the new release racks for vinyl. On the other hand, with many individuals and retailers offloading their vinyl collections, there are some great bargains to be had . . .

Another point is that music tends to be recorded in a way that suits the dominant medium of the time. In the Sixties, recordings were often very simply made with relatively few microphones, which necessarily meant distant microphone positions (to gain the required coverage) and a fairly reverberant sound.

Later, the industry largely changed over to multi-mic techniques, in part to impose a degree of consistency on the final product irrespective of where — or by whom — the recording was made, and partly of course to facilitate post-production. The inescapable logic of multi-mic techniques is that the microphones are placed close to the music sources, and ambience is reduced and/or rendered incoherent by the multiplicity of non-time aligned images of the same acoustic captured on the final recording.

OK, so I've oversimplified like crazy, but there is no escaping the logic that multi-mic techniques worked with most record based systems rather better than they do with most CD based systems, irrespective of how the top one per cent of record players behave. Multi-mic techniques provided a close-up through the magnifying glass view that records thrived upon. Play the same material on Compact Disc, and the sound all too often becomes muddled.

Ergo, if your prime interests are in classical material from the great explosion of recording activity through the Seventies and Eighties, records deserve very serious consideration indeed. If your interests lie largely in new recordings, they will have been recorded with CD replay in mind, and vinyl versions will often be lacking in vitality and clarity.

The tests did highlight one of the most widespread of all the canards concerning record playing systems, namely that the record deck itself is the key component in the system. For some time I have translated this logical non-sequitur to mean that most record decks have lacked the qualities necessary to carry their jobs off properly and this was confirmed to a large extent by the tests. Of the two vinyl systems, one in particular was very sensitive to the performance of the record deck employed, though the second system proved to be more or less immune to changes in the source used (within reasonable limits of course) perhaps because this system had other, greater problems. However, none of the Compact Disc systems betrayed much source dependence at all.

My own reading of all this is that it has little to do with any supposed logical priorities when designing systems. The system which proved especially sensitive to the turntable used was also one that needed firm control in the very low frequency region, which is precisely where turntables are traditionally at their weakest, and CD players are at their strongest. The message is that Compact Disc facilitates some redistribution of system priorities compared to those based on records. At least with most of the systems tested in this report, it seems that record based systems require what looks at first sight like disproportionate attention to the choice of record player, where Compact Disc allows the available resources to be spread around a little more equitably.

£430 System

NAD CD player, Marantz amplifier, Allison loudspeakers

It is just about possible to buy a CD based system worthy of being called hi-fi that costs less than this one, but it's not easy, and it won't be *much* cheaper. Meanwhile £430 invested in this system buys three products from recognised 'names,' each of which comes to the system with solid reputations and considerable critical acclaim — including Best Buys from this very magazine.

Realistically it will cost a little over £500 to get it on the road, taking speaker stands and cables into account, and this buys a system which will work well in modest size rooms, but which might sound out of its depth when transplanted to medium size rooms (say 12m² or larger), especially where lifelike volume levels are required. It's also less than ideal for organ and choral music freaks due to bandwidth limitations. Within those constraints, and with a few additional caveats along the way, it works very well indeed . . .

NAD 5425 Compact Disc player

No product from the NAD stable has had quite the same galvanising effect on the marketplace as the original and celebrated 3020 integrated amplifier, which must have first gone on sale about 15 years ago if it was a day. The £200 5425, however, is a remarkably fine candidate for the role of a 3020-like CD player. In truth, the standards of mechanical engineering are nothing special, the bent ironwork and moulded plastic casework would do credit to a player at half the price.

On the other hand, the fascia is free of gimmickry, and there is no mistaking the purposefulness of the design, or the excellence of its sound quality. The 5425 turns

out to be a genuinely astute package, a real giant slayer, because, in common with the seminal 3020, the resources available have been invested where they will do the most good.

The working bits inside are centred on a MASH low bit converter (née Technics), around which NAD's engineers have weaved an elegant power supply circuit which allows it to operate near the peak of its ability, and with reduced RFI consequences to the rest of the circuit. Good quality components are used in the very few places where they make a big difference, but, simplifying a more complex story like mad, everything else has been allowed to go hang.

Facilities include track skip and audible cueing using dual function keys whose assignment changes according to the current setting of the pause control. Oh — and basic track programming and repeat. The stick type remote control handset adds dedicated scan and track skip controls.

Omissions other than those already mentioned include a headphone socket and tape editing facilities. The display is a rather attractive but distinctly dim orange panel which includes a simple function indicator, the current track number and elapsed track timings.

Believe it or not, there is a stripped down version of even this stripped down player: the 5420 is identical except that it lacks remote control and it costs about £30 less. It is even possible that the reduced current drain on the power supply will result in improved sound quality.

The original sample supplied failed to lock onto the track and timed out each time it was asked to play. A second sample worked perfectly.



Marantz PM-30 amplifier

Marantz has had a good couple of years with its amplifiers after producing the *PM-40SE*, a highly successful direct equivalent to Pioneer's barnstorming *A-400*. There's an equivalent but slightly lower powered and simplified model called the *PM-30SE* too, and these are the two designs that have grabbed most of the headlines for Marantz since their introduction. Meanwhile, the basic models from which they were derived have tended to take a back seat, but a very strong case can be made for the cheaper of the two, namely the *PM-30*, on the grounds of value for money.

The design is comparatively straightforward in technical terms, and the reader is pointed to the full blow by blow account published in issue 104. The real clue to its success, however, can be summed up in a single figure extracted from the accompanying propaganda: £130. This of course is the *PM-30*'s current selling price, which makes it one of the cheapest amplifiers with pretensions to good sound quality available today.

The *PM-30* doesn't look cheap. The box is bulky and although it's not very highly





specified internally, I've seen a lot worse at considerably higher prices. Externally, the plastic fascia moulding is plain but well finished, and control feel is adequate. There has been no attempt at the kind of minimalism that informs the costlier models in the range. The *PM-30* does have tone controls for example, but they can be bypassed using a 'source direct' switch that also bypasses the two tape circuits. Inputs: phono (moving magnet only), three line sources and two tape. Headphones and a single pair of loudspeakers can be connected, in the case of the latter to decent 4mm binding post terminals.

Or perhaps not so decent. I had one persistent problem with the amplifier: whenever either of the sets of output terminals was subjected to any strain, for example, by the weight of a loudspeaker cable tugging at them, the sound would intermittently disappear. To make the amplifier work reliably I had to reroute the cable.

Allison AL-100 loudspeakers

Allison is a US based company, founded donkeys years ago by one Roy er... Allison (surprise!). Roy, who used to work for Acous-

tic Research, had a particular interest in the loudspeaker/room interface, and the way rooms altered the performance of the loudspeakers. Early Allison designs had strongly tailored intrinsic response shapes which were designed to be corrected by their specified positioning, usually hard up against walls and sometimes in room corners, but the results always contained an element of idiosyncrasy. Room matching remains a priority with Allison, even with low cost, compact designs where the limited LF bandwidth should militate against strong room interaction, but recent Allison models, including the *AL-100*, have tended to become less uncompromisingly tuned to their environment and less idiosyncratic as a result.

To look at, the *AL-100* is a perfectly conventional two way loudspeaker in a standard vinyl wrap box with a plain baffle and two rather ordinary looking drive units, though the curved synthetic perforated cover remains an attractive oddity in its own low-key way. Less common, however, are the sheets of instructions supplied which specify in close detail the optimum distances to room boundaries as a set of ratios of lengths. Correct setting up can be a rather pedantic

exercise as a result, but I obtained good results by using them on pedestal stands about 50cm tall, 30cm clear of the rear wall and well clear of side walls.

Over the years, UK distribution of Allison loudspeakers has been somewhat erratic, and prices have been rather high, but matters have settled down with the current distribution arrangements, and the Allison AL range is very attractively priced, apparently because they're built for the UK market 'in Europe.' Time was when that was a euphemism for Denmark, the home of the paint-on tweeter (I kid you not), but the AL series is actually built in Italy.

Sound quality

At the outset, and even after making some changes, I couldn't quite make this system behave as I would have liked. It had its problems. At the end of the test period though, they were tantalisingly close to having been resolved.

The problems were highlighted by a recording of the second movement of Mahler's sixth symphony (Sinopoli/Philharmonia on DGG) which contains a lot of exposed multipart writing for upper strings, which I

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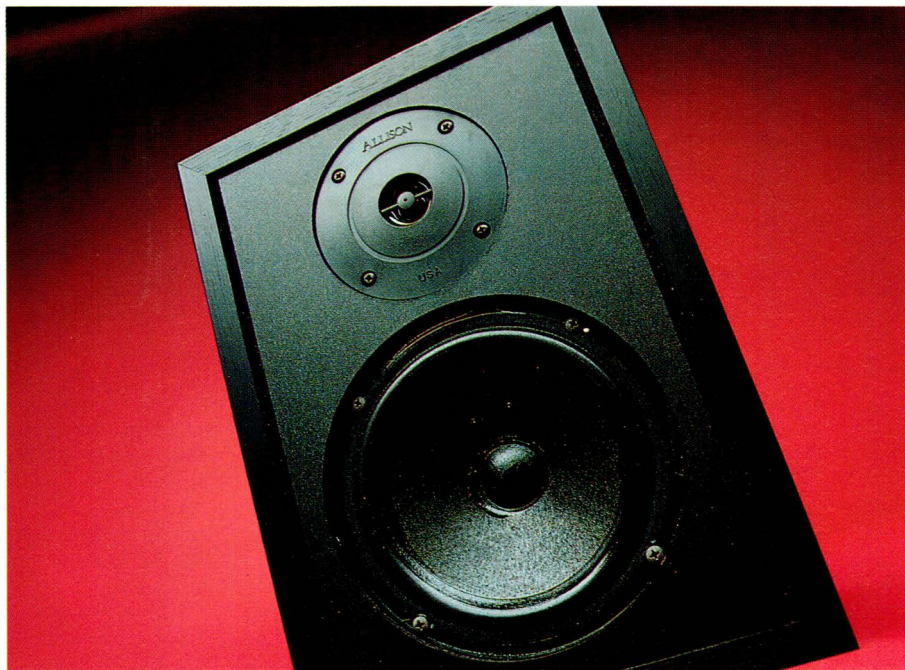
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used to compare this system to the Marantz/Rotel/Arcam system which costs about £140 more. The Allison had plenty of raw power and vitality, but became progressively more frazzled as the volume crept up, while the stereo image stayed coplanar — there was little sense of depth. Part of the reason for this was the lack of bass depth, which is important because it is low frequencies that contain much of the information that distinguishes a distant source from one that is nearby. By contrast the Arcam sounded rather cool, and lacked a clear sense of differentiation between instruments in the lower midband, which is where the Allison excels. Above these frequencies, and especially in the midband and treble, the Arcam sounded infinitely (OK, not *quite* infinitely) smoother, more integrated and more polished. Stereo soundstaging was much more firmly locked into three-dimensional space and overall the sound 'breathed' in a more realistic and meaningful way.

Changing to different types of material revealed a completely different side of this system's performance. Playing Jennifer Warnes, the Allison displayed surprisingly good middle register vocal quality (Warnes can murder a bad loudspeaker) and a truly coherent balance, with a firm sense of presence, and a solid punch in the upper bass. The superbly recorded drumming in *Bird on a Wire* came across with a solid 'thwack' which was unmatched by the Arcam, and its ability to present pitch and dynamics in the bass was nothing less than remarkable for such a compact design.

The picture I was beginning to piece together by this time was of a system which was almost completely dominated by the loudspeakers (I had already tried other amplifiers with comparatively little effect. It displayed some scruffiness in the treble, and produced some quite strong colorations with acoustic material where colorations are most obvious, which made it more or less unacceptable with certain material. At the same time, this was also an articulate and solid sounding system, especially in the midband, and its ability to 'play toons' in the bass, and to drive a rhythm as though it meant business, was of a very high order.

At this point I also began to notice that despite quite an extended running in period



(over 72 hours using a white noise source before listening commenced, the speaker face down on a carpet for the duration) the speaker continued to become smoother and sweeter over the following days and even weeks), and towards the end of the test period the system began to cosset the ears rather than assault them.

The NAD CD player was a delight. It can sound a little thin in some situations, but the Marantz amplifier certainly didn't exaggerate this tendency. Instead it highlighted its fine sense of detail, its excellent control and its lucid midband — and more generally the coherent and believable overall standard of music making.

The Marantz also worked satisfactorily in a group context, but although it was hard to put a finger on any specific weakness when assessed without the benefit of a side by side comparison, I quickly discovered that upgrading to a Marantz *PM-40SEII* added stereo depth, authority and more eventful music making with a greater sense of light and shade. Price is the real constraint here of course, and while a better amplifier may be desirable, few are obviously better than this one at the price.

Conclusion

There is nothing to be said against the build quality of the Allison speakers, which are turned out as well as most, and which worked correctly straight from the box. The amplifier, on the other hand, had an intermittent output (see above), and as I have previously experienced a similar failure with another amplifier in the *PM* range, I conclude that the problem may not be an altogether isolated instance. The NAD CD player was also rather flakily built, and as we have seen, one sample failed to work. On the most favourable interpretation it's probably fair to say that the products concerned are no better built than they need to be.

Musically, this is a system of considerable, if slightly uneven, talent. It takes quite a long time to bed down, but even then is no more than passably neutral tonally, and perceived distortion levels are higher than normal, especially in the upper midband and treble. It is the *dynamic* properties of the system that sets it apart. If you like your music to drive hard, to sound fast and assured with rhythmic material and to reproduce dynamics as though it really means business, this could very well be the one for you. And let's not forget that it is also conspicuously good value for money.



GENERAL DATA

Compact Disc Player	£200
Remote control	yes
Headphone socket	no
Digital output	no
Dimensions	42x9x25.5(wxhxd)cm
Amplifier	£130
Power output	40 watts/channel
MC cartridge compatible	no
No of inputs (ex tape)	4
No of tape circuits	2
Dimensions	42x14x28(wxhxd)cm
Loudspeakers	£100
Type	2-way sealed
Recommended placement	30 cm from wall on stands (see text)
Impedance	6 ohm
Sensitivity	90dB/watt/mtr
Power handling	75watts (approx)
Dimensions	34x24x20(wxhxd)cm

£570 System

Marantz CD Player, Rotel amplifier, Arcam loudspeakers

This Compact Disc playing system, which is based on well known components from three of the best known names in the business, should be easy to track down in the shops. The components concerned break few design conventions, but are broadly representative of the best of modern design at the price level concerned. As a relatively low power, low cost package, it can be a little anaemic sounding in large rooms, but the speakers are quite substantial and bass extension is good.

Clearly the system as it stands is unsuitable for high level use with rock material, but it could be a very good choice for those who like large scale (for example orchestral) music and want to play it at moderate volume levels.

Marantz CD-52 Compact Disc player

Marantz held out longer than most against Bit Stream (Philips proprietary 1-bit) conversion, but in the end it has succumbed, and the *CD-52* is the first of the new Marantz Bit Stream generation.

The *CD-52* is otherwise consistent with previous models, but this is not to say that it is the same. FTS (Favourite Track Selection, which recognises CDs and plays programmes assigned to chosen discs) has been augmented by a second FTS circuit (his and hers?).

For reasons that remain obscure, but which may have something to do with common inventories of handsets with other models, only the first of the two memories can be accessed using the remote control.

The display is a little busier, more comprehensive, and also uglier and more con-

fusing than before. A full range of the usual search and programming features is provided along with a headphone socket with an associated volume control. The digital output — coaxial thankfully — is switchable to avoid interference with the analogue circuits when it is not in use.

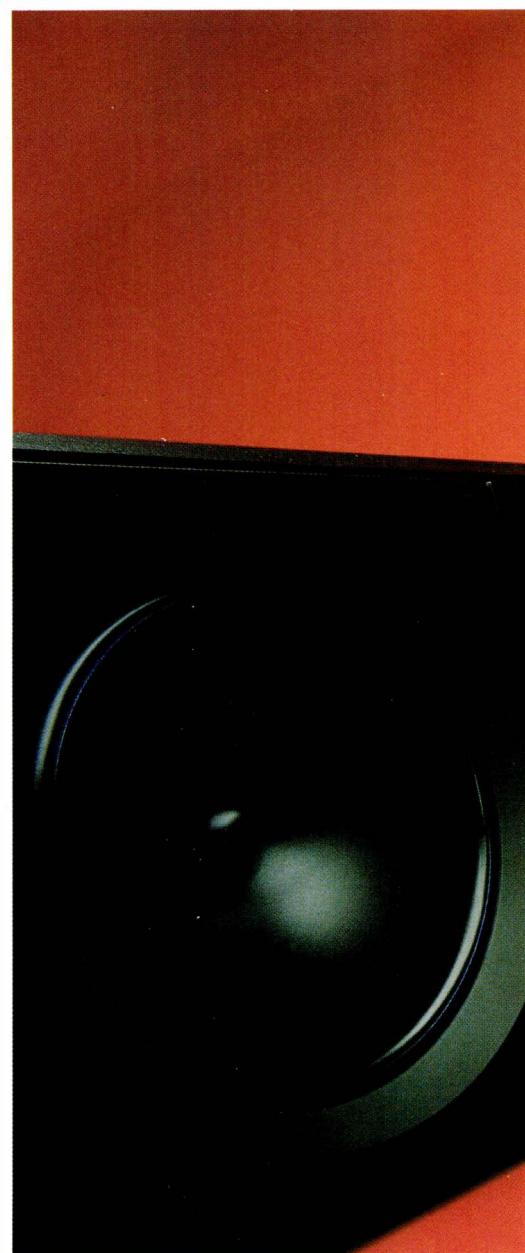
The new styling, with its lower waistline and lozenge shaped controls, is a considerable improvement on the earlier generation, but poor detailing, especially around the drawer, leaves it looking contrived.

For those with a little extra money to spend there is a Special Edition version of this player, which is outwardly and functionally identical, but which has selected passive components (capacitors, resistors etc) in critical circuit areas. The SE models (a Marantz speciality) are generally worth the extra cost, and in this case the SE conversion, which was informally assessed during the test, turns out to be particularly successful.

Rotel RA-930AX amplifier

In common with other Rotel products, the *RA-930AX* isn't going to win any beauty contests. In fact, it looks rather odd sat alongside the Marantz CD player, and odder still if you sit the taller and narrower Marantz on top. At least they're both black . . .

The *RA-930AX* is a chip off the old block, using a derivative of the familiar Rotel circuit. This time, power output has been increased slightly, and certain components in the signal path have been replaced by higher quality types to reduce known colorations. The transformer is also said to be of an improved type and the main PC board has been relaid to produce a more symmetrical layout between channels, loss of symmetry



here often detracting from stereo soundstaging. The amplifier's earthing topology has been improved too.

At 30 watts/channel, power output is just about adequate for the system speakers in a medium size room.

The amp comes complete with both bass and treble controls, although the manufacturer recommends bypassing them whenever possible. Two pairs of loudspeakers can be accommodated, one of which can be turned on and off from the front panel.

Disappointingly, Rotel has fitted just a single tape circuit (with off tape monitoring), giving a total of five inputs all counted. The phono input is restricted to moving magnet cartridges, a sensible limitation at the price.

Notwithstanding the comments earlier on the Rotel's rather plain Jane appearance, it is unusually well constructed and finished for a sub-£200 amplifier, and in this respect it has no peers.

Arcam Alpha loudspeakers

Remarkably, the Arcam *Alpha* loudspeaker, which right from the start looked like a lot of box for the money, has not increased in price for the last two years. It cost £200 then



and it costs £200 now, and it's hard to think of any half decent loudspeaker of comparable size that costs less.

Even more remarkably, it includes various cosmetic measures on the front panel that should endear it to those who don't like seeing screw heads securing drive units to baffles. Although the black ash vinyl wrap and black plastic baffle mountings that hide all the grubby stuff look pretty sombre, they have the desired effect of allowing the *Alpha* to blend in with almost any kind of surroundings.

There are few other concessions to fashion. Forget all about metal dome tweeters and the like; the *Alpha* is fitted with a well sorted but conventional soft dome tweeter, and a polypropylene cone bass driver fitted with a hard, bullet shaped centre cap which should cause fewer resonance problems than typical soft centre caps, and which will have a small phase correcting influence near the 2.5kHz crossover point.

The *Alpha* is a substantial size box, with a big visual footprint and a 20litre capacity, but in practice it takes up less room space than many of its rivals since it is designed for use fairly close to a rear wall (but see later).

Covers are provided, though their magnetic catches are weak and they fitted only insecurely. The system looks and sounds better when they're set aside.

The impedance curve is benign (the minimum impedance is said to be just 6.5ohms), and with an 89dB sensitivity there is no reason to doubt the ability of the Rotel RA-930AX to cope. At least on paper then, the system looks well matched.

Sound quality

Setting up of this system proved a breeze. The *Alpha* is a bit too lowly up the audiophile ladder to bother with biwire connections, so only one length of speaker cable is needed. Based on experience both with this system and on other occasions with the *Alpha* loudspeakers, a thin, simple cable is just what the doctor calls for, as long as the copper used is of high purity.

The *Alpha* is a good, straightforward loudspeaker, and it likes good, straightforward ancillaries. But you will need good quality stands, ideally open frame types spiked both upwards and downward. If your stands are only fitted with carpet piercing spikes, use four small blobs of Blu Tak or similar be-

tween the top of the stands and the base of the speakers.

Although the Arcam *Alpha* is said to work fairly close to a rear wall, I found that the bass/midband balance was a little more comfortable when the speakers were pulled forward to give at least 50cm of free space behind the speaker's back panel. This is a matter for experiment of course, but is worth taking some care over. The *Alpha* is big enough and goes deep enough in the bass for this to make a substantial difference.

The *Alpha* is very nearly an excellent loudspeaker. In a time when speakers seem to need days, and sometimes weeks before they come on song, the Arcam comes out of the box trilling like a good 'un.

Any further settling down with use is modest if it is a factor at all. I heard no obvious changes through the test period, except for the suggestion of a slight strengthening and deepening of the extreme bass, which may be caused by loosening up of the bass driver suspension.

The Arcam is above all a well behaved loudspeaker. Coloration levels are low, distortion is even lower, and it is an easy transducer to hear through to the music

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beneath. Put another way, it is not intrusive, and any added character that the speaker imposes on the music is hard to identify.

The same unfortunately isn't quite true of subtractive effects. For all its very obvious strengths, the bass had a light yet strangely ploddy character, and complex rhythmic lines tended to sound ill at ease, as though the musicians involved couldn't quite get their act together.

The clarity and agility of the Rotel are definite plus points in this context, but I did achieve more solid and meaningful bass results by switching to a Marantz *PM40SEII* (£240) which I have hanging around for just such eventualities. The Rotel is a little too lightweight and too unatmospheric to take full advantage of the *Alpha's* relatively extended bandwidth.

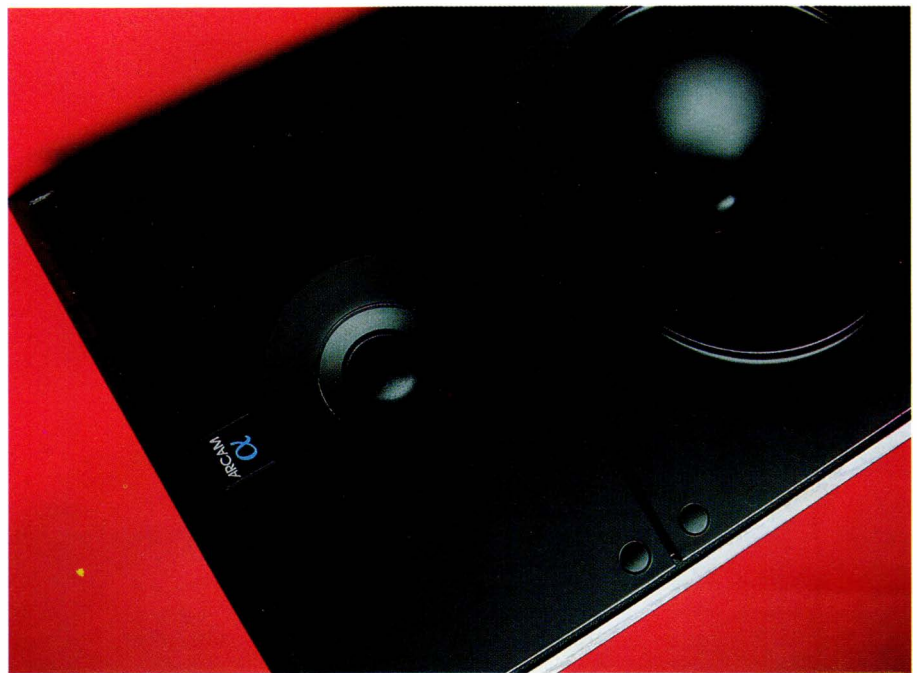
Nevertheless, in contrast to a number of the other systems tested (and particularly the cheaper Allison/Marantz/NAD system tested on page 48) this system proved remarkably easy on the ear, and comfortable to live with, which made a very pleasant change.

It is a sharp and clear sounding package which offers bags of well organised detail, an open-mouth vocal quality and sufficient low frequency extension to give a real sense of scale and authority to the sound.

The contribution of the Marantz *CD-52* CD player should be described as satisfactory rather than distinguished. Over a several day period, I used this system with CD players from NAD (the *5425*) and Ariston (the *CD3*) in addition to the Marantz, with readily distinguishable results much of the time.

The NAD was a little less refined, but arguably provided greater access with densely scored, complex material (Mahler symphonies and the like), though the Marantz was significantly less grainy and intrusive. The Ariston offered broadly similar levels of detail to the Marantz, but it is a better player in other respects which highlighted a certain sloth in the Marantz, and which drove the system with real zest and power.

The Marantz is a good Bit Stream player, but like a number of others which use the same chips, it tends to be a little opaque at very low levels — reverberant energy and very hushed playing is not always cleanly



presented — and dynamics sometimes seem slightly squashed.

The spider in the middle of this complex web is the Rotel *RA-930AX* amplifier, which with line level sources is about as good as they come at £170.

It is a finely judged design which extracts enormous amounts of detail from the source, and which presents it coherently and realistically. It controls the speakers well, and performs seamlessly at different volume levels, that is until you overload it, at which point it goes off the rails, that point being a little lower down the volume scale than ideal.

When it does overload, the amplifier quickly becomes extremely raucous. The other noticeable quality is a perceptibly lean, dry overall balance which is not ideal for the Arcam speakers which respond well to a somewhat fuller, bolder sounding amplifier. This is not criticism of either the amplifier or the speakers, but it is a reflection of a less than completely satisfactory match between the two. At this point in the discussion, however, we come up against that nasty word 'money.' It will cost you more to do any better.

One additional point arose from the tests during which I had a quick bashette with the Systemdek turntable (borrowed from the system which also includes a Musical Fidelity amplifier and Audio Note loudspeakers). This confirmed that the amplifier was considerably less successful when auditioned through the phono inputs.

Confirming an observation I had made with an earlier sample on another occasion, the Rotel sounded rather lumpy and opaque in the bass with records, and that Compact Disc sounded lighter but more tuneful and agile. Ergo, this is a better Compact Disc system than it is a record playing one.

Conclusion

As if the lesson needed rubbing home, this is a classic example of a system constructed from three highly capable and well liked products which in the final analysis simply failed to display ideal synergy.

There is little wrong with any of the components when assessed individually, but in combination they made much of the music sound curiously uninvolved. It seems that good sound and good music making are not always synonymous. A different choice of either loudspeakers or amplifier could quite easily get the system pulling in the same direction.



GENERAL DATA

Compact Disc Player	£200
Remote control	yes
Headphone socket	yes
Digital output	coaxial
Dimensions	42x12x28(wxhxd)cm
Amplifier	£170
Power output	30 watts/channel
MC cartridge compatible	no
No of inputs (ex tape)	4
No of tape circuits	1
Dimensions	44x8.5x30.5(wxhxd)cm
Loudspeakers	£200
Type	2-way sealed (IB)
Recommended placement	on stands, near wall
Impedance	8 ohm
Sensitivity	89dB/watt/mtr
Power handling	80 watts (approx)
Dimensions	26.5x46x26(wxhxd)cm

£1,120 System

Arcam CD player, Audiolab 8000A amplifier, Tannoy 609 speakers

In conventional dealer-speak, this is not a typical starter system, but something a little more ambitious that could well be chosen as a first upgrade, or where more than just a basic system is required. It is based on a very sensible CD player which uses long established but now very well sorted technology, a similarly long running and conservatively designed amplifier and a pair of medium size speakers which are, well, a little different . . .

Arcam Alpha Compact Disc player

The press release I've extracted announcing the introduction of the Alpha CD player is dated August 1989, which means that it has managed to defy convention by remaining available, essentially unaltered, for about as long as any three consecutive models from any of its rivals. As well as being a neat trick in its own right at a time when models often seem to change on an all but seasonal basis, the Arcam's longevity could be interpreted as mute testimony to the underlying integrity of the design.

The *Alpha* is a 16-bit four times oversampling player based on Philips' well respected TDA1541A DAC, but with significant Arcam input elsewhere. Design highlights include separate analogue and digital transformers driving four regulated supplies.

Visually the *Alpha* continues the safe and sensible theme with a sombre looking but good quality case design fabricated from alloy pressings and extrusions. The features count is very basic, but does include simple track programming, track skip (of course) and audible cueing, but there's no headphone socket and just a single set of fixed level analogue outputs. Both of these are sensi-

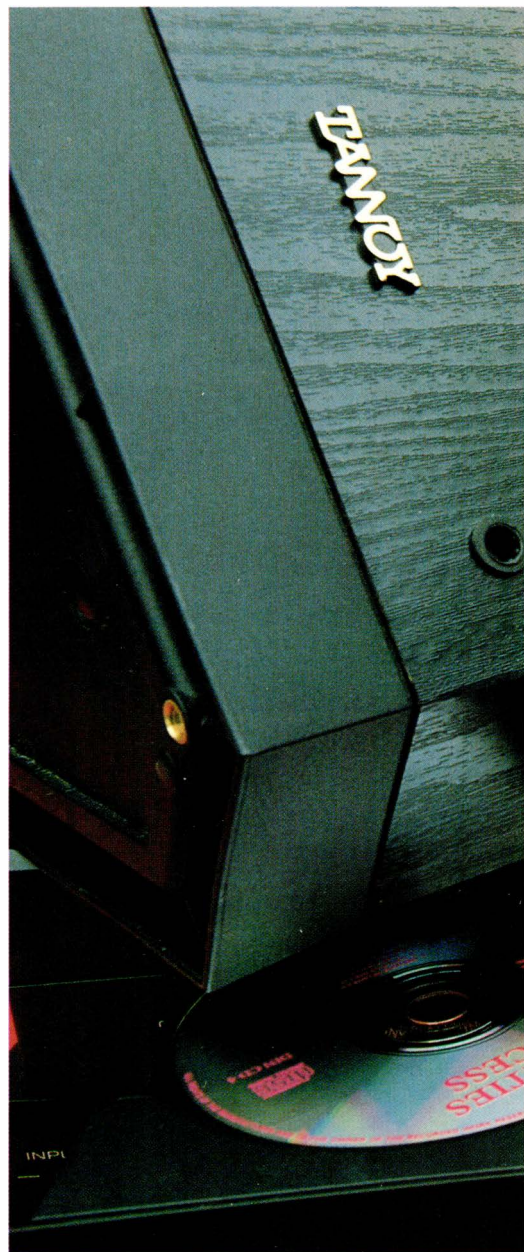
ble decisions if judged against the fact that both provisions almost inevitably (if only subtly) compromise sound quality. Remote control is supplied in the form of a familiar looking handset from the Philips parts bin. An electrical digital output provides some future proofing.

Audiolab 8000A amplifier

Another old favourite, the Audiolab *8000A* is now in its second major incarnation, though only the external covering (now a decidedly unradical black) betrays the fairly extensive mid life internal changes that have served to keep it competitive over the years.

The *8000A* is an ambitious and well equipped product with an unusually powerful output stage rated at 60 watts per channel. The elegantly designed front panel is fully equipped with the kind of facilities you'll be familiar with from lesser equipment, but configured in such a way that they don't impede music making in the way audio purists would expect.

To avoid the extra cable runs normally required when a headphone socket is wired into the speaker feed, it is relay coupled. A great deal of work has gone into the tone controls, so that whatever you may think of their usefulness, there is at least scant cause for complaint that they impede the normal functioning of the rest of the amplifier. They're served by a true bypass switch, but more usefully the networks leave the midband area largely untouched even with maximum gain or cut of bass or treble, and even at the frequency extremes, output is variable only over a manageable $\pm 6\text{dB}$. This helps ensure that the amp is hard to overload even when being driven outside its normal operating envelope.



The *8000A* is flexible in other ways too. There are no less than three tape circuits, which will be a godsend for those assembling complex systems, perhaps with an A/V component. In addition, there are two straight line inputs (though any unused tape circuit can be used to the same ends of course) and a phono input with MM/MC switching. Two sets of speaker terminals are fitted, one via a front panel switch. To cap it all off, Audiolab has even provided preamp output and power amp input connectors, which enables some quite sophisticated systems to be assembled involving extra power amplification, either to power remote speakers in another room, or for bi-amped or active loudspeakers. A further possibility is that the Audiolab will serve in a Dolby Surround system, or that the internal power amp is simply bypassed as part of an upgrading programme at some time in the future. Needless to say, Audiolab produces matching pre and power amplifiers.

Cons? Not many. In several months of almost continuous use of this and other Audiolab products, I have not once experienced any electrical failures or signs of temperament, and the amplifier is certainly





well protected against abuse. I have, however, experienced other minor problems, namely input controls which have loosened on their control shafts (the maker insists you have to be pretty ham fisted to do this, but replacements are readily available) and the front panel control markings and legends which tend to fade if rubbed.

Tannoy 609 loudspeakers

The 609 comes from near the middle of the Tannoy Sixes range, being a substantial two way, rear vented design intended for use on medium height stands some distance from room boundaries. The crossover is at 2.5kHz, and with an 89dB sensitivity, 5ohm minimum impedance and 200watts peak power handling (the latter is rather optimistic by my reckoning: the sound is on the verge of overload within the capabilities of a 100watt amplifier with wideband material), the story sounds fairly straightforward.

Nothing could be further from the truth, and the word radical used in the original review (issue 102) is fully appropriate. It takes a special kind of courage for any major producer to introduce a range of affordable, mainstream loudspeakers which don't con-

form to the traditional upended rectangular coffin stereotype, but Tannoy has done just that with this series, and by all accounts has met with considerable success.

The irregular hexagonal shape provides a range of advantages. The smaller individual panel sides raise their resonant frequencies, and the differences in panel sizes scatter those resonances so that no single one becomes dominant. The shallow cabinet edge angles at the front reduce diffraction, and the relatively narrow baffles similarly aid lateral dispersion, though less so on this model than with some others in the range, as the substantial driver imposes a fairly wide panel width. Internally, the six sided cross section helps disperse internal reflections. The top and base are moulded items, with internal bolts clamping the sides and stiffening the enclosure, as well as bearing against the driver magnet through a mastic pad. It's all clever stuff.

The drive units are also different. Despite appearances, there are two, but they're mounted concentrically, the tweeter in the mouth of the bass flare, which itself provides horn loading for the treble. The design of this kind of unit is extremely tricky, but

Tannoys' experience is unrivalled. The tradeoff is a certain amount of roughness compared to the best conventional systems, but the benefit is equally persuasive, complete phase integrity around crossover, irrespective of the listening axis.

Aesthetics are taken care of by neutral 'black ash' vinyl wrap sides, which look horrible, and by a strange sounding but oddly attractive blue/brown laminate top panel inset which cleverly keys into the dominant room colouring. Matching stands were supplied and used.

Sound quality

Not for the first or the last time in these tests, it was the powerful personality of the loudspeakers that dominated proceedings. The qualities of the other components were important, but in much less obvious ways and as enablers rather than doers.

The 609 is a loudspeaker that needs some getting used to, first to appreciate its rather unusual properties (not all of which are directly related to the dual concentric driver or the hexagonal enclosure), and second to learn to filter out the things it does badly.

THE AUDIO NOTE AN-SERIES LOUDSPEAKERS

Now that we have seen a few reviews of the Audio Note loudspeakers, all of which have been very complementary, I would like to explain the important parameters which we believe to govern loudspeaker design and their behaviour in the average living environment

Having made a long and careful study, which is still going on, we have found four factors that greatly influence loudspeaker performance and behaviour.

- 1.) Unit to unit consistency.
- 2.) Dispersion.
- 3.) Dynamic room behaviour.
- 4.) Efficiency and amplifier load

I shall deal with these in the above order.

It is very critical that there is as little deviation in acoustic output within a pair of speakers as possible. If there is much difference in the acoustic output between one speaker in a pair and its partner, it is not possible for that pair of speakers to reproduce a proper stereo signal, with a correct left to right balance, back to front stage or instrument timbre or position.

The detrimental effects of great differences in acoustic output between the speakers in a pair on the performance of a stereo system should not be underestimated, as it is a major contributory factor to the confusing array of contradictory results achieved with speaker – amplifier and speaker – cable combinations and thus really stands in the way of broader agreement on and understanding of what works and what does not.

Our loudspeakers are all individually adjusted to have a unit to unit (within a pair) deviation of no more than ± 0.2 dB over the full bandwidth. This is achieved under dynamic, live conditions in an environment which is as reverberant as a normal living room, at a minimum distance of 1.75 meters.

There is good cause to accuse the way that loudspeakers are measured for many of the ills that loudspeakers suffer. Close microphone positioning (all loudspeaker data published are measured at 1 meter), the extremely poor sensitivity of the measurement equipment, in contrast to this we work to an accuracy that requires a test set-up that is hundred's of times more sensitive than standard set-ups (on a normal MLSSA 7 (Melissa!) set-up the line is thicker than our maximum matching tolerance).

The fact that many speakers measure the same, but are vastly different in sonic performance, is an illustration of

how thoroughly inadequate the current measurement techniques are.

I believe there are two areas that need re-examining, one I have already mentioned, measurement equipment sensitivity, which needs to be brought much closer to that of our hearing system, the other is more easily rectified.

Measuring distance, as mentioned previously all loudspeaker data are measured at 1 meter, this is a wholly unacceptable distance as nobody actually listens to speakers that close.

In most ways this is similar to the way many modern recordings are made, i.e. close miked and multitracked. There is a simple experiment you can carry out to ascertain how extremely poor and distorted recorded objects sound, when "looked" at from this close a distance, just take a microphone and connect it to your stereo system, and then let someone, whose voice you are familiar with, read from a book or a newspaper, and just listen to the changes in the character of their voice when the microphone is close and further away. A simple and very convincing demonstration of the unnatural colouration introduced by having the microphone too close to the sound source. Loudspeakers are themselves sound sources and are subject to the same problem.

We designed the Audio Note speakers using the best available source components and amplification (Voyd Reference, Audio Note AN-1s tonearm and 10 Cartridge), Audio Note ONGAKU/M7 Phono pre-amplifier and AN-S7C MC transformer, but also the aforementioned method of live speech through a suitable microphone, primarily to ensure correct midrange balance and realism.

Dispersion

Obviously, room interaction and its effect on the speakers output has a significant influence on the speakers' behaviour in the room, it is, in my opinion, therefore of the utmost importance that the speakers' output is "seen" by the room in the same that it would see a real instrument.

This view contradicts current thinking, but is based on the following considerations:

All rooms, like concert halls, have some character of their own, and to have as a goal that a speaker must sound the same in all rooms is absurd. What in my opinion counts is that the speaker should react no differently to any given room than an instrument would do. For example, if you move a violinist from room to room, the sound of his violin will change slightly, but most importantly you will in each different room be able to hear that it is

the same violin being played by the same musician. A pair of loudspeakers should be expected to do no better than that.

We have therefore strived to ensure that the speakers' acoustic output as closely as possible resembles that of an inverse microphone, i.e. each speaker should act as a hemispherical pressure generator over its full bandwidth. Instruments are omnidirectional pressure generators as a general rule, and since the microphone can only pick up the frontal part of this in real time and the remainder as a time delayed reflection it seems to me to make sense to design the speaker to be able to reproduce just that.

All Audio Note loudspeakers are therefore designed for the widest possible dispersion and evenness of off-axis response over their full bandwidth.

It must be understood that although we have come a long way towards this goal (the AN-Es response at 90 degrees off-axis is some 6dB down at 15KHz), we are some way away from perfection in this respect, especially when price is made a consideration.

Dynamic Room Behaviour

All rooms, regardless of size, have an acoustic saturation level, which varies with frequency, normally it is predominantly a problem at low frequencies. This level is also dependent on loudness and duration of frequency energy.

All our tests have shown that a loudspeaker which has a good dynamic response, especially in the bass, where the room has its lowest saturation threshold, behaves far better in the overwhelming majority of rooms than a speaker with a sluggish bass performance. It is thus very important for the speaker to have a "fast" bass response. Let me give you an example, if you take a kettle drum into a room you will find that you can play it very loud indeed without the room reacting with resonances of its own, from this can be concluded that it would be desirable for a speaker to have the same property.

We therefore used the lightest possible diaphragm with the strongest possible generator (magnet), coupled to a very carefully designed cabinet that "loads" the unit very efficiently at low frequencies.

Any energy "stored" by the driveunit or cabinet will make the speaker respond slower than desirable, and contribute to "holding on" to the energy, which in turn will leave the sound there for longer than desirable. Remember that the room has an acoustic "memory" of its own (its resonance frequency) and that has a

reaction time of its own. So if the speaker or instrument is quick, the room will not have time to react, conversely if the speaker is slow the room is given more time.

A speaker's efficiency greatly aids its dynamic behaviour as it couples more effectively to the air, partly by easing the amplifier's dynamic transfer capability. It should be understood that amplifier power in itself does guarantee dynamics, dynamic transfer is a different property altogether and should not be confused with loudness.

Efficiency

I shall touch briefly on this aspect, not because it is unimportant, but space is running out!

In my opinion speaker efficiency is one of the most misunderstood and contrived subjects in Audio, since the availability of inexpensive amplifier power in the early 1960's, speaker efficiency has been regarded as almost unnecessary. This is a grossly wrong assumption!

Whilst it is true that amplifier power can achieve the necessary loudness from a less efficient speaker, to equate that to dynamic ability is to completely misconstrue the properties of these two aspects of performance. Loudness is NO compensation for dynamic range and never will be.

Speaker efficiency should be viewed as a question of maximizing the amount of sound you get from the signal transferred from the amplifier. As an example a speaker of 90dB efficiency only turns about 3% of the energy fed to it in acoustic energy, leaving 97% of the energy to be dissipated as heat.

The gains that can be achieved in fidelity, all other aspects being equal, by improving the speakers energy conversion to say 10% are very considerable indeed. Think about that the next time you read about a speaker that requires a 2-300 watt amplifier to drive it, because it is 80dB or less, or converts about 0.3% of the signal to acoustic energy.

Would you buy a car with that kind of fuel efficiency?

Peter Qvortrup

Audio Note Co. Ltd.

Brighton

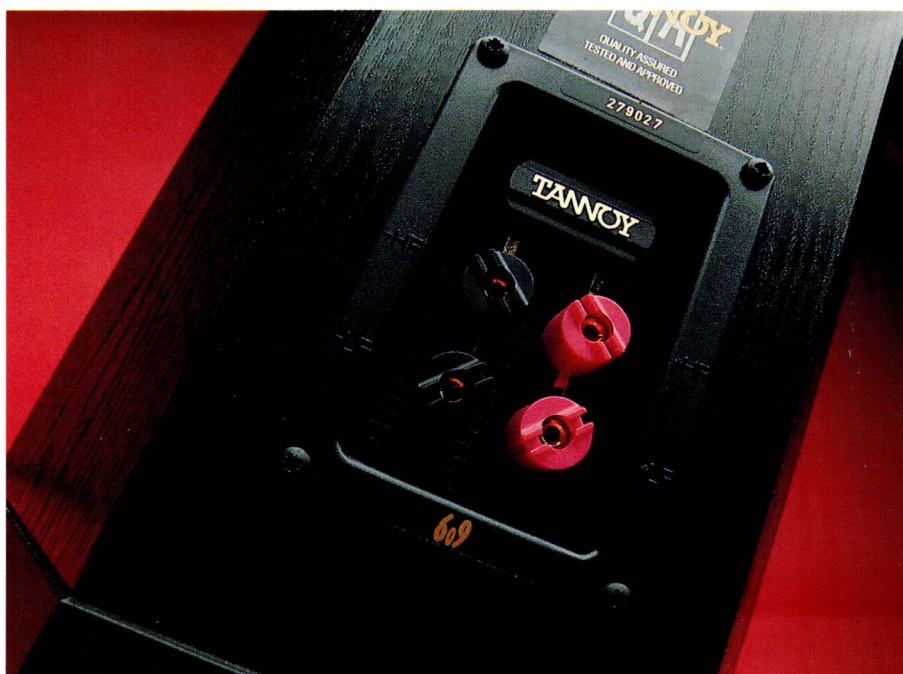
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The old saying about there being no gain without pain seems quite apt here. As noted earlier, the dual concentric principle offers the unique benefit of coherent phasing of the two drive units almost irrespective of where you sit in relation to the speakers, but it imposes some important constraints on the design of the two drive units, and especially of the tweeter, which in the past has given the dual concentric breed something of a reputation for raggedness. A tremendous amount of work has gone into both the new tweeter, and the way it integrates with the midband, and the evidence in the case of the 609 is that solid improvements have been made.

Although the 609 emerges from the box sounding raw, it soon settles down to produce a well integrated style of music making. But the job has not been accomplished without cost. There is a generalised loss of energy in the treble region which results in a certain residual coarseness, and the handover from the midband to the tweeter isn't quite seamless either. It tended to sound recessed and coarse in character, with some clearly identifiable colorations. The bass had its own problems: it sounded a little tubby and slow, and was unable to articulate transients clearly, which was noticeable on piano and drums (the slurring of rhythms in *His April Touch* by Billy Childs on Windham Hill Jazz for example). In the language of hi-fi, the Tannoys sound slow, coloured and 'shut in.'

There were important good points to be set against the bad though. The Tannoy has a big sound. The music sounds as though it is coming from a big box: the bass is well developed and unsquashed, and there's plenty of room even for acoustic bass to swell out with a realistic sense of that instrument's characteristic rasping body resonance, and with realistic image scale to match. The Tannoy wasn't especially adept at pinpoint imaging across the soundstage in the manner of a number of its rivals; everything tended to sound rather diffuse (which is probably closer to reality in some cases at least). On the other hand, the 609 has few peers when presenting a coherent overall soundstage by filling the space between the speaker enclosures, and the space behind and in front of the enclosures. There are times when you can almost feel the



presence of the instruments, and in this sense, and despite a superficially rather blousy character, the 609 is almost unnervingly realistic.

The Audiolab amplifier and Arcam CD player lent sterling support. They are well suited for the role, with a perceptibly more solid delivery and feeling of real muscle under the velvet glove in the case of the Audiolab, which is a genuinely classy and sophisticated amplifier even leaving price to one side. The treble control ended up being used to correct the deficient mid/top balance to good effect, without noticeable adverse effects elsewhere. The CD player similarly sounded excellent. Driving a number of speakers (through the Audiolab), the reasons for its longevity were soon obvious. It's a damn good CD player, not because the treble is cleaner than all the others — it isn't — or because it images better than the rest — it doesn't. It's simply an excellent all-rounder, with very little overt character to speak of, and it does everything well enough that the player ceases to hog the attention. Unlike some more glamorous machinery, the Arcam hands the spotlight over to the music, which is where it belongs.

Conclusion

I hesitate to give the system a ringing endorsement. It's good, as they say in the movies, but it ain't *that* good. What it does, it does very well indeed, and this includes most of the big things. It provides vivid imagery and can produce realistic image scale in medium size rooms from many recordings.

Clarity, speed and tonal accuracy are not the systems' best points, but the system is voiced well: singers appear to breathe where they are supposed to, rather than sounding desiccated and/or sterile, which is all too common with CD based systems. The Compact Disc player and amplifier do a good job of allowing the speakers to show off their potent bass without loss of control, and in general the system made very likeable noises, or it did after I had had a chance to accustom myself to its particular colorations and aberrations.

Rather than give a blanket recommendation to the Tannoy 609, I'd prefer to suggest auditioning a pair carefully first. If you decide to switch this component, the amplifier and CD player are both neutral and capable enough to survive almost any reasonable replacement in the same price range. If you stick with the Tannoys you'll end up with quite a talking point.



GENERAL DATA

Compact Disc Player	£420
Remote control	yes
Headphone socket	no
Digital output	coaxial
Dimensions	43x8.5x29(wxhxd)cm
Amplifier	£430
Power output	60 watts/channel
MC cartridge compatible	yes
No of inputs (ex tape)	3
No of tape circuits	3
Dimensions	44.5x7.5x33(wxhxd)cm
Loudspeakers	£270
Type	2-way dual concentric, reflex loading
Recommended placement	stands, open
Impedance	8ohms
Sensitivity	88dB/watt/mtr
Power handling	175watts (approx)
Dimensions	32.5x50x23(wxhxd)cm

£1,160 System

Rotel CD player, Pioneer amplifier, Castle loudspeakers

There are two big-ish systems in this review group, of which this one is the less costly and easily the more aerodynamic, thanks to the elegant Castle column loudspeakers. Neither the Rotel CD player nor the Pioneer amplifier could be described as glamorous or even especially good looking, but they're market leaders with established reputations, and the Pioneer especially has come to be accepted as a yardstick against which others are compared. The loudspeaker is a recently introduced derivative of an up-market design called the *Winchester*. It is the nearest thing this system offers to the radical leading edge, though the way it sounds tends to contradict this analysis. Now read on . . .

Rotel RCD-965BX Compact Disc player

This player, or one very like it, is what you'll end up with if you go out looking for 'just a CD player' whose only important properties are that it sounds good and that it costs a few crisps short of a packet.

Hence the short (but adequate) list of bells and whistles, the plain styling — and the technology, which although bitstream-based, in common with the *965BX*'s predecessor, is a little unusual in opting for a comparatively unglamorous member of the bitstream family, namely the single ended SAA7323. This is essentially an update of the *7320* used in the original (and highly successful) *RCD-865*. Other changes from the *865* are primarily matters of refinement and detail.

The player is built to what is often euphemistically described as normal commercial standards, being based on the standard slightly rattly Philips plastic transport and

Rotel's rather less rattly standard metal box wrap, which looking on the plus side does make it a little more solid and stable than some comparably priced players. Nevertheless the test sample supplied was in a rather sorry state cosmetically — the main function buttons didn't line up properly. Oh — and it didn't actually work either: it spun the discs OK, but wouldn't lock onto any tracks. Happily I had another to hand, which was substituted for the rest of the test programme.

Pioneer A-400 amplifier

What can I say about the Pioneer *A-400* that hasn't been said before? Just in case there is someone who doesn't know about it, the *A-400* is for most people the de-facto standard against which other affordable amplifiers are now measured.

In physical terms it sets no new standards, but from long experience I can say that it goes on working no matter what, though it does suffer from a slight tendency for controls to loosen or drop off if it is not treated with some respect. The control system mirrors the Rotel CD player in being simple but not extreme.

You get an MM/MC switchable phono input, two tape circuits and three line inputs, with separate 'record' and 'listen' selectors. There are no tone controls and balance is adjusted by differential use of the two friction locked (and beautifully progressive) volume controls.

Power output is about 50 watts per channel, which, from experience, is fully available even into some quite punishing loads. This is one of the factors that has given the *A-400* its well deserved reputation as a giant slayer.



Castle Chester loudspeakers

The Castle *Chester* will raise more eyebrows than the other components in this test, and for more than one reason. It is first and foremost a great looking piece of kit. There are always those for whom any loudspeaker that can be seen with the naked eye is too big to countenance, but providing you don't fall into this category, its slender proportions and superb real wood veneer should be a real turn-on. It looks better with the covers on though, as Castle has not done a B&W or Celestion by dressing up the driver area to conceal screws and mountings.

Another unusual feature of the Castle, and the one that is bound to grab the headlines, is the bass loading. Instead of using a resonant sealed cavity or an even more resonant bass reflex enclosure, the *Chester* takes a more ambitious path with what Castle describes as a quarter wave folded pipe in which the bass driver drives a pipe (or 'line') at a position approximately one third of the way along its length.

Damping is provided by tapering the line, which is formed by internal partitioning, and this has the desirable side effect of bracing and stiffening the enclosure. The line opens



out near its end into a semi-horn shape, and vents to the open air. The properties of this loading technique include improved transient response, a lowering of the fundamental LF resonance (a traditional sealed box provides an air spring which raises LF resonance, and tuned boxes behave similarly, albeit with different LF resonant Qs and roll-offs) and an increase in LF sensitivity. In other words, a louder bang for a given box size, though the more complex box inevitably means a few extra bucks.

The other interesting features of the system is that in place of the usual covered miniature tweeter that Castle has been using for years, the *Chester* is fitted with a substantial looking alloy dome with a phasing plate doubling as an anti-poke device at the front.

The *Chester* is a fairly sensitive speaker at 90dB, and on paper should be happy with the level of drive available from the Pioneer even in the moderately large listening room used for the tests.

This was the case in practice too. The speakers are designed to be used free-standing away from room boundaries, or on short pedestal stands which unfortunately

were not submitted for this test.

A number of alternative finishes are available, including mahogany, black ash and walnut. Cherrywood, teak and oak can be had for a ten per cent surcharge, and yew and rosewood for 20 per cent, with still others available to special order.

Sound quality

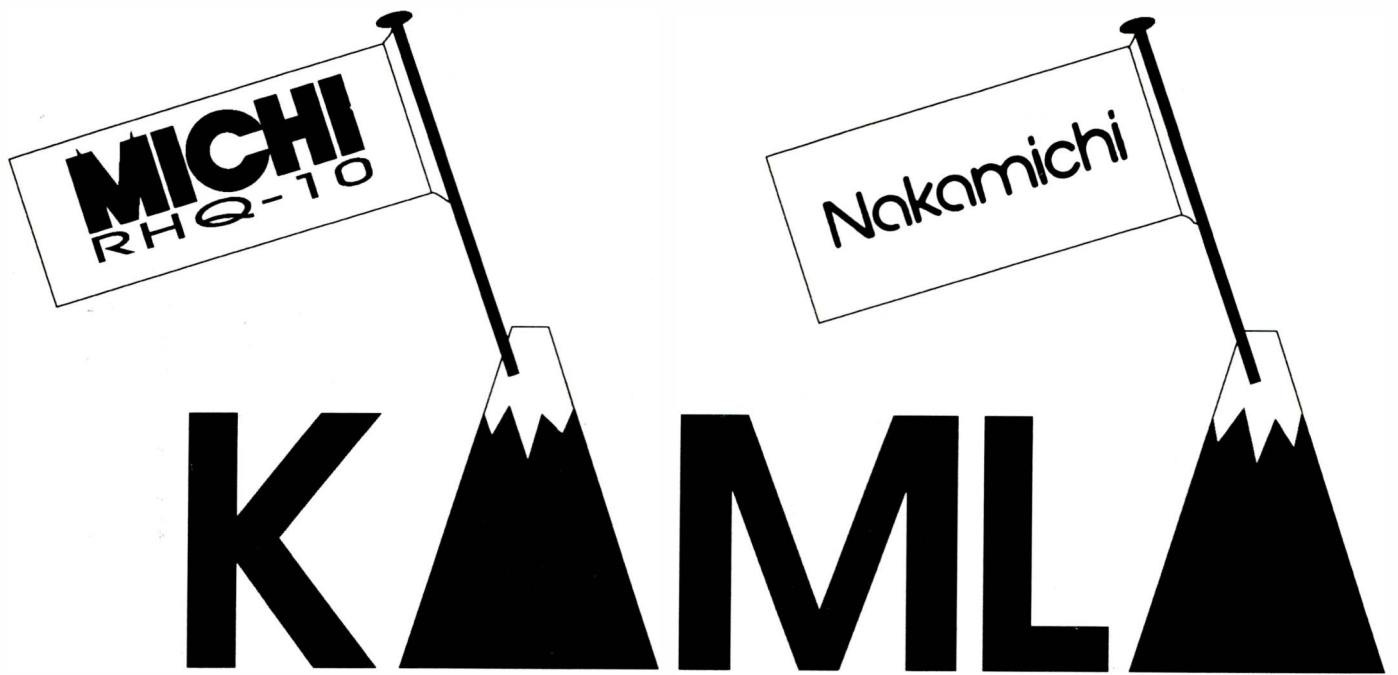
What happens when you team three very fine components together? Not necessarily what you first thought of, that's what. This system is a good example of one that, although based on fine components, collectively lacks the synergy demanded of a successful system.

The first disc played was Handel's *Music for Royal Occasions* (King's Consort/Choir of New College Oxford etc on Hyperion), which makes a gorgeous, warming noise. I've used this disc in tens of systems, and from the start it was obvious that something was amiss here. The meticulously crafted and measured opening to the *Birthday Ode for Queen Anne* lost its customary magic, sounding dry and anaemic, with little of the scale and depth that is so prominent a part of the recording, and little of its range and

expressiveness either. The lovely cool trumpet solo part lost some of its creamy smoothness, and ended up sounding processed. The music as a whole sounded shut in, desiccated and detached, but there was at least plenty of detail to massage the hearing right through the audio frequency band, even if it wasn't presented in an especially attractive or lifelike way.

Unfortunately the alto solo that followed showed another side of the system, namely a degree of fierceness when being driven a little harder, and it soon became obvious that the system lacked dynamic range. The amplifier was perfectly capable of driving the speakers quite hard, and there was no problem in producing relatively undistorted peak levels well over 100dBA in my listening room, but what little grace and air there was dissipated almost completely as the volume was wound higher.

The system was palpably working hard at these volumes, and the strain was also apparent in a sense of woodenness and edge in the upper midband and treble that high replay levels made obvious. There were some quite significant treble colorations, at times I began to feel that I was hearing the



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treble as though through the wrong end of a long tube.

Time and exposure can lead to a reassessment of the lack of gravitas, but it did nothing to reduce the almost subliminally perceived loss of structure and architecture. True, there was no shortage of bass depth. Occasional deep bass lines in Handel's *Elijah* for example, were handled with grace and authority, and there was no doubt that the lowest notes were being hit square on, with no doubling and absolutely no loss of pitch integrity or timing.

Yet despite this there was a lack of presence in the main part of the bass and across a substantial proportion of the lower midband spectrum. The system sounded disembodied, not just with both Handel discs mentioned so far, but with solo and small group acoustic material of various types ranging from jazz to classical, and a number of chamber recordings used throughout the test programme. The system's intrinsic clarity worked in its favour with some rock material (eg *Simply Red*), but on the whole the rather edgy performance at high levels was a liability, and the loss of image scale and sonority was all too obvious with large scale orchestral material.

And this is how matters stood at the end, despite attempts at repositioning the speakers, extended running in, changes of loudspeaker cables (DNM solid core cable helped a bit). Even a switch to the Musical Fidelity A1 amp from the Systemdek/Musical Fidelity/Audio Note system reviewed on page 68, though its slightly 'shaped' response is arguably a little closer to the Castle's requirements, failed to address the fundamental problems.

By a process of elimination, it became obvious what had gone wrong. No fault attaches to the amplifier or the CD player, which singly and in alternative permutations work brilliantly. Both in their way are articulate designs, with no pronounced level dependency at least up to moderately loud settings in the amplifier's case. The combination, however, was not a good one. Both products tend to sound a little thin, which is usually manageable when the items are used with other components with more neutral or contrasting characteristics, but which is all too obvious here as the speaker is also balanced in the same way.



Conclusion

This system caused problems on test, and, despite my best efforts, wouldn't settle down satisfactorily, though this is not to say that it did not provide many individually engaging and sometimes exciting moments over several weeks of intermittent use.

The CD player and amplifier are good, solid stuff, each living up to its reputation for clean, articulate and engaging sound quality. They're both on the lean side, verging on dry at times, though neither wants for bass depth, tunefulness or control. The CD player is notably smooth and unstressed in the treble, though it has to be said that the combination of the amplifier and the CD player is almost too much of a good thing, and generally speaking, when starting with either one of these products, I would probably want to look at something with complementary qualities as a partner.

And then we get to the Castle *Chester* loudspeakers. The bass has some important qualities, notably unusual clarity and tunefulness, and a remarkable freedom from the usual resonant effects caused by bass reflex enclosures especially, of which the most notable are a 'pulling' of pitch, a loss of

stereo depth and width and also of openness and 'air' in the bottom octave or two.

As a matter of policy or habit, I didn't even look under the covers at the drive unit compliment until the listening had been all but completed, and the listening notes had been largely compiled. Consequently I had no inkling until the last that the tweeter was a metal dome unit, and you will notice that the word metal and its derivatives don't appear in the listening notes. For many years, Castle had a home brewed tweeter, and although it was a somewhat old-fashioned design, it had never sounded totally out of its depth, and it must have been quite a wrench to replace it with a metal dome. It can only be hoped that the dome will be refined and improved over the years, because the present one gets in the way of the *Chester's* other qualities, many of which are extremely positive.

What we end up with from the *Chester* is something of a curate's egg, and plainly not a design that responds well to being driven by equipment like the Pioneer *A-400* and Rotel *RCD-965BX*. Readers are referred to the review of the speakers in issue 98, which presents an alternative view based on different listening conditions and peripheral equipment.



GENERAL DATA

Compact Disc Player	£320
Remote control	yes
Headphone socket	no
Digital output	coaxial
Dimensions	44x9.5x30.5(wxhxd)cm
Amplifier	£240
Power output	50 watts/channel
MC cartridge compatible	yes
No of inputs (ex tape)	4
No of tape circuits	2
Dimensions	42x12.5x35(wxhxd)cm
Loudspeakers	£599
Type	2-way, free standing, quarter wave bass loading
Recommended placement	open space
Impedance	8ohms
Sensitivity	90dB/watt/mtr
Power handling	300watts (approx)
Dimensions	23x91.5x25(wxhxd)cm

£1,400 System

Roksan record player, Lecson amplifier, Epos loudspeakers

The system tested here is designed for the vinyl using community, and specifically for those in the market for a high resolution but relatively compact system for use in a smallish room. Of course, there is nothing to stop it being extended with other sources, be they Compact Disc, radio or tape, and the system was informally assessed with an Ariston CD3 CD player in addition to the specified Roksan *Radius* record player.

Roksan Radius turntable with Tabriz arm and Corus Black cartridge

The *Radius* is designed to offer the traditional benefits of a middle market turntable as produced by a high-end supplier. Much of the engineering for the *Radius* was originally developed for the *Xerxes*, which, for example, boasts a very similar slender main bearing, and a similar split and decoupled dual chassis, the workings for which are concealed on the senior model by the outer wooden rectangular frame. The two part platter involves much less precision engineering, and the motor decoupling system is much simpler. A two speed power supply is built in, and the veneered finish has been ditched in favour of a textured paint.

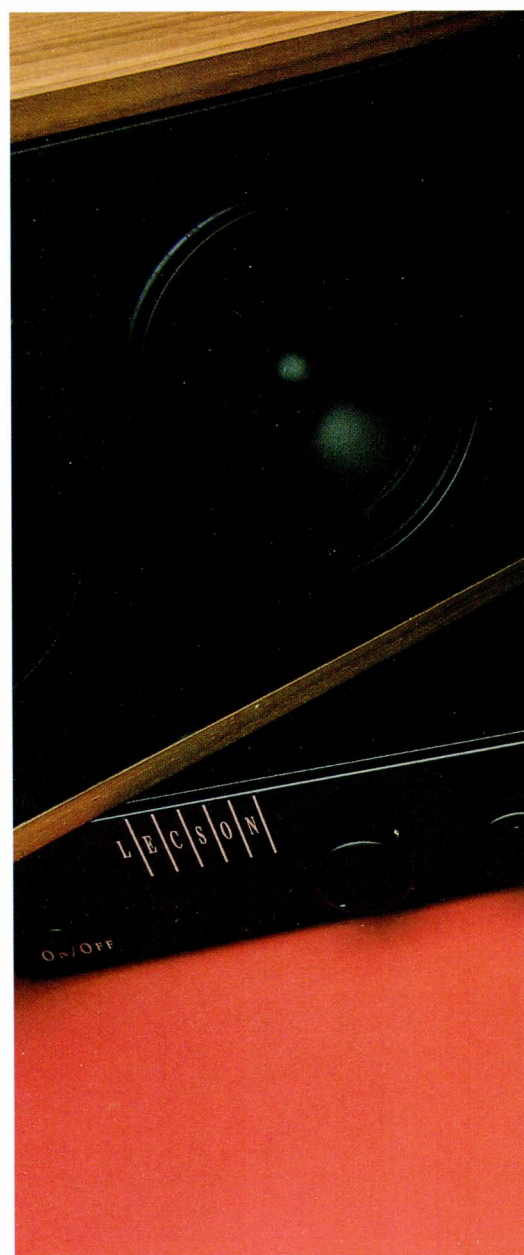
Aesthetically and ergonomically however, the *Radius* is a honey, its photogenic good looks being equally impressive when viewed up close. Switch speed change as incorporated here remains a novelty, but a welcome one, though in other respects the player is as manual as they come.

The arm is the Roksan *Tabriz*, which is a downwards derivative of the *Artimez*, with a wide beam arm tube from which the headshell is press-formed. Bias is applied by

calibrated spring, but tracking force is completely uncalibrated, though Roksan supplies an Ortofon stylus tracking force balance which is fairly accurate, if fiddly to use. The *Corus Black* completes the package. This interchangeable stylus MM cartridge is based on the Goldring 1000 series but with structural inserts intended to counter any lack of structural integrity, and with a Gyger Type III stylus, which has a relatively uncompromised line contact grind and requires considerable care in setting VTA (vertical tracking angle). This is best achieved by ear, altering arm height (a similar effect can be achieved by varying tracking force within reasonable limits) until the soundstage snaps into focus. A shallow, coloured treble with excessive surface noise is a sure indication that the stylus is sitting in the wrong orientation in the groove, across the almost vertical line of the groove modulation.

Lecson Quattra integrated bi-amplifier

The *Quattra* is a specialist integrated amplifier which has been around for quite a while, and which has been developed considerably from its modest origins. But this is an amplifier with a difference. Where others have a single power amplifier per channel, this one has two per channel, or four discrete power amplifiers in total. The *Quattra* is designed to extend the idea of bi-wiring, in which each drive unit (in a two way loudspeaker) is wired back separately to the amplifier terminals. The *Quattra* allows full bi-amplification, an intrinsically less compromised method of driving speakers in which each drive units has its own dedicated power amplifier, which goes a long way towards eliminating any mutual interaction between



the drive units of the kind that is inevitable when two electrically reactive loads are connected to the same power amplifier.

A similar result can be achieved with an additional stereo power amplifier and a conventional integrated amp (or pre/power amps), and companies like Linn and Audiolab now make explicit provision along just these lines. The *Quattra*, however, does the job at a previously unprecedented low cost — £349 — which is little more than you might expect to pay for comparable stereo integrated amplifier with the usual complement of power amplifier stages.

There is a tradeoff however. The available power output module is limited to just 16 watts per channel (in practice about 19 watts says the manufacturer), with a comparatively humble rise to 25 watts into four ohms, the output being limited by the modest power supplies. These figures are more than adequate for tweeters, but bass drive units tend to be power hungry, and could be current starved by this design. Load impedances higher than eight ohms are not recommended because there isn't enough voltage to do them justice.

Facilities are limited. There are separate





record and listen selectors for the six inputs, which include a single tape circuit and a phono input which can be switched between MM and MC settings. Volume, balance and mono switches complete the list of goodies. The Lecson has no headphone socket. Build quality is more than adequate, and finish is improved in the current version, with the Perspex front replaced by a metal item with a similarly glossy finish. The front panel screen printing is a letdown, but there are no other complaints.

Epos ES11 loudspeakers

Epos was founded by one Robin Marshall who was the prime mover and shaker behind the metal dome tweeter programme that spawned the Elac metal dome family subsequently used by Monitor Audio and others. Robin eventually formed his own speaker company, which although no longer independent — it now comes under the TGI group umbrella, along with Mordaunt-Short and Tannoy — has kept to its original remit of making compact but exactly specified high performance loudspeakers at prices not completely out of touch with the mass market.

The *ES11* is the smaller and more recent of two currently available models. Quintessentially English both in its visuals and sound, the vaguely Celestion S-series appearance is based on mounded plastic front and rear panels which sandwich the MDF frame that forms the sides, top and base. The woodwork is substantial, and the structure is stiffened and braced by four compression bolts that pull the back and front baffles together, applying tension to the woodwork in between. The front moulding includes the bass unit chassis whose small synthetic cone surrounds a stationary centre projection fixed to the magnet pole face, which provides some control over phasing and dispersion at the high 5kHz crossover frequency, as well as reducing colorations traditionally associated with centre dust caps. The tweeter, naturally, is a variant on the metal dome theme that is a familiar part of all Epos loudspeakers.

Configured as standard for biwiring — or as in this case bi-amping — the *ES11* bass driver is direct coupled to the amplifier, the intrinsic mechanical treble roll-off of the unit being used to take it out of circuit. The tweeter, of course, requires electrical as-

sistance. Note that it is comparatively unstressed in this application due to the choice of a high crossover frequency. The system is reflex loaded and is designed for use on purpose made frame stands, fairly close to a real wall. Although a simple electrical load, which bodes well for its use with the Lecson, the Epos is far from being a high sensitivity design, which is not such a good start.

Sound quality

During the initial setting up, it was discovered that the Epos is unusually fussy about partnering equipment, and not in readily predictable ways. Naim amplification is reputed to work well with the Epos, yet excellent all-rounders like the Audiolab 8000A, which can normally be relied on to make a bag of nails feel like the finest goose down, sounded curiously over the top. The Lecson, however, worked, and worked well, but only within a narrow dynamic envelope. Everything happens around the three o'clock position on the volume control, but by four o'clock, which is just approaching what might be called 'loud', the sound has coarsened. By half past four, it's distorting like the stuff is going out of style.

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Compact Disc Players

Meridian 602 transport and 606 DAC (£3100) £2295; **Micromega Duo** CD transport and Duo Pro DAC (£2750) £2150; **Micromega Duo** CD transport and Duo BS DAC (£2200) £1699; **Micromega Solo Pro** integrated. dem model (£1550) £995; **Micromega Leader** integrated (£749) £649; **Micromega Optic** BS integrated (£695) £499; **Rotel RCD 965BX** integrated (£320) £275;

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Loudspeakers

Meridian D600B digital active (£2950) £1950; **Meridian M30** active (£950) £695; **Sonus Faber Elector** (£1592) £1195; **Ruark Crusader** three way floor standing (£1325) £899; **Ruark Talisman** passive natural ash (£640) £540; **Ruark Talisman** active black ash (£640) £540; **Heybrook Sextet** inc stands black (£1079) £879; **Neat Petite** miniature (£525) £375; **Epos ES14** latest spec (£475) £375; **Heybrook HB1** updated to S2 walnut s/hand £129; **Royd The Seven** Black finish (£140) £115;

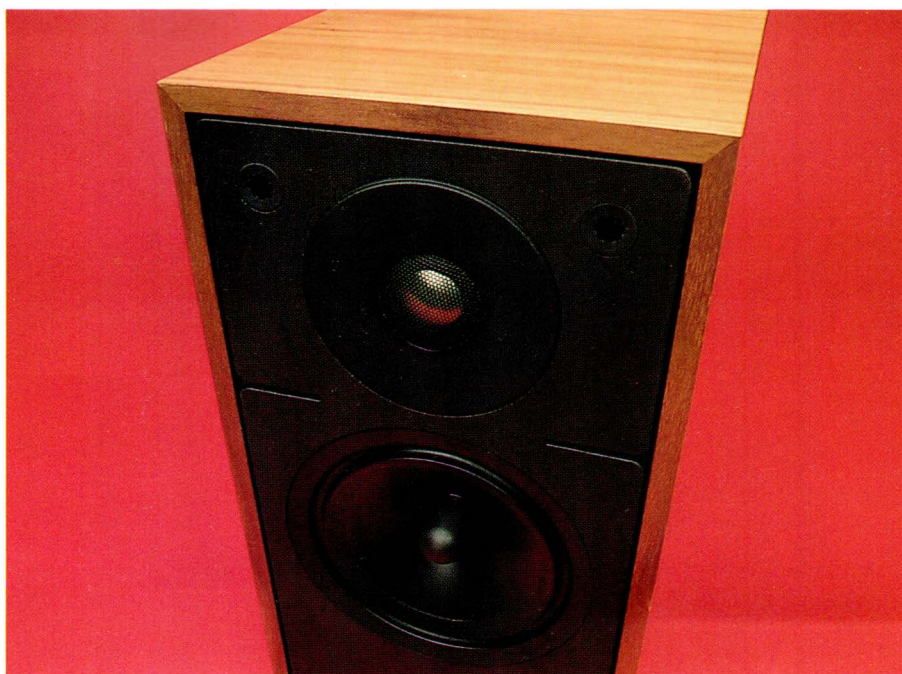
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The *ES11* is a smallish loudspeaker, and no attempt has been made to make it sound like anything other than what it is, and this means a variety of things, including relatively small scale stereo imagery and a lack of deep bass even taking the compact dimensions into account. In addition, the overall frequency balance definitely favours the upper midband and lower treble.

In no other sense were the speakers open to criticism. A combination of a fine but strangely cool amplifier and a relatively sophisticated and well rounded source was enough to control and refine an exuberant and astonishingly detailed loudspeaker, and at its best, with the right material, the Epos really motored. Some of the most notable moments came when playing small-scale material, epitomised by both Mary Black and Baroque harpsichord. I was especially impressed by some Beethoven string quartet playing (Quartetto Italiano, the finale of No 4 Opus 18) in which the Epos simultaneously underscored the elegance of the ensemble playing while making the most of the sinewy, cutting sound of vigorous bowing. Through the Tannoy *609* (in the Arcam/Audiolab/Tannoy system), the instruments sounded rather tubby and lacking in both clarity and energy. Just in case it's not entirely clear, the differences I'm describing here are neither minor nor easy to miss; and nobody with hearing left would be likely to give a substantially different account.

Even in this comparison, however, the Epos based system didn't have it all its own way. The loss of large scale stereo imagery was obvious from the start (though the precision with which instruments could be placed between left and right, and to a certain extent in depth, was defined almost to within minutes and not just degrees of arc). Full orchestral material tended to suffer as a result, and so did much mainstream rock, blues and jazz, though I found myself continuing to listen, partly because the sound was so clear, and so beautifully phrased and controlled. Much of this material also showed off the *ES11*'s quick, accurate timing, which was ably supported by the rest of the system. I don't think it's an original observation that the *ES11* is rather like a pair of fine headphones, but it is certainly an apt one.

The Roksan performed well, with no obviously identifiable areas of weakness,



but it is relatively unstressed in this system, presumably because of the lack of LF energy, and during the course of the tests I used a number of turntables (including models as varied as a Systemdek *IIX* and a Roksan *Xerxes*) with good, but often near indistinguishable results. The main area of variance tended to be associated with the high frequency end, which is dominated by the cartridge, and even the *Corus Black*, which is an unusually competent moving magnet design, occasionally sounded a little grubby in this region. I briefly tried an (old model) Audio Technica *AT-F5* which provided a more refined and better resolved top end, but the leaner sound of the cartridge was inappropriate for an already lean sounding system, and on balance the Lecson's MC input is not enough of an open window to justify the extra cost involved.

I was pleased and impressed by the amplifier when used within its power/volume range, and frustrated by the narrowness of that range. When it worked well, it worked very well, with a fine sense of balance, and excellent separation between the different musical parts, though it could not be described as unduly dynamic. On the

whole though the well controlled and unprocessed sound was what the rest of the system required.

Conclusion

This is a surprisingly engaging system of real refinement and exquisite detail recovery, but suitable only for moderate listening levels in rooms of modest dimensions. In the end, the main problems of this system are the inevitable ones caused by lack of cubic inches, volts and amps. The system simply can't get its electronic voice around big orchestral words, and subtle ambience was largely suppressed.

The sound had presence by the bucketload; the system does a tremendous job of bringing the musicians into the listening room, but they are divested of 'space' and as a result sound rather dry. You may well object that the Epos is not unusually small, and that other similar size speakers don't attract such comments, and this is true. The special factor here is that the Epos is not voiced like other speakers; it has a pronounced mid/treble bias, and as a result you lose scale, architecture and sonority, and gain detail, precision and analysis. It's a straight trade, and in many smaller rooms, its probably the right one. But it is not achieved without cost.



GENERAL DATA

Turntable	£595 (cartridge £120)
Speeds	33/45
Cartridge	magnetic, interchangeable stylus
Dimensions	37x44.5x35/5cm (hxwxdr) rear overhang
Amplifier	£349
Power output	16 watts/channel
MC cartridge compatible	yes
No of inputs (ex tape)	5
No of tape circuits	1
Dimensions	43.5x7x31 (wxhxd)cm
Loudspeakers	£330
Type	2-way reflex
Recommended placement	on stands, near wall
Impedance	8 ohm
Sensitivity	87dB/watt/mtr
Power handling	75 watts (approx)
Dimensions	37.5x20x25(wxhxd)cm

£1,485 system

Systemdek record player/Musical Fidelity amp/Audio Note speakers

This final system is the second based on records rather than Compact Disc, and it uses three well tried and respected components, including the Audio Note *AN-J* loudspeaker which some readers may recognise has a common heritage with the Snell *Type J* (see below). Although it is the costliest combination in this project, I paired it with the Rotel/Pioneer/Castle system for much of the listening to help provide a wider context for the comments that follow, not least because it seemed to me that the two systems are of broadly similar ambition. Parameters such as power handling and speaker size actually favour the cheaper system, though as it turns out this is far from being a critical issue.

Systemdek IIX/900 turntable/ Moth arm/Goldring 1042 cartridge

Even after several years serial production, the Systemdek *IIX* looks as fresh as a daisy. Where most of its competitors are dressed in plastic imitation veneers or other laminates, the Systemdek is fully wood veneered, in a striking blond ash in the case of the test sample. The deck is belt driven and employs a high compliance suspended subchassis, as a result of which handling of the arm can be a little tricky if you don't have a steady hand. Speed change is achieved manually, by first removing the felt mat and glass platter, and repositioning the belt on the motor pulley. The usual arm for this turntable is the one supplied for this test, namely the Moth arm, which is the ubiquitous Rega *RB250* (surely now Rega's best selling product) in a very unconvincing disguise, ie none at all.

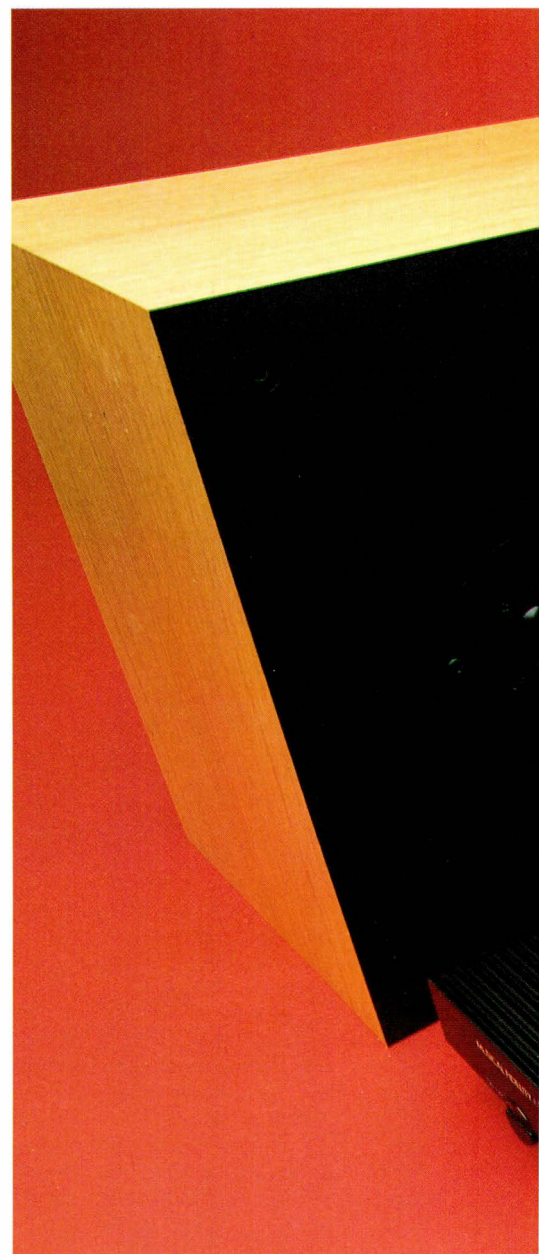


The Goldring *1042* cartridge completes the player. This is the top ranking model in the *1000* moving magnet series and features a replaceable Gyger S line contact stylus. The stylus profile is responsible for making setting up a rather painstaking affair as even quite small changes in stylus orientation, which occur as tracking force is changed, significantly alter the mid/top sound balance and the subjective effect of surface noise.

Musical Fidelity A1 Mk II amplifier

Although aesthetics must finally be a matter of personal preference, I have no doubt that the *A1*, which is said to have sold over 30,000 units, is one of the three styling triumphs of the British amplifier industry over the last three decades. The others were the original Cambridge Audio *P40* and the short-lived Lecson brand, again the original range featuring flat multicoloured preamplifiers and tubular power amplifiers.

The *A1* was designed by industrial design company Pentagram, and even now, more than five years after it was unveiled, is a strikingly beautiful shape. It is also thoroughly practical. Only those with whole brain lobotomies will have difficulty getting the *A1* up and running, even without the instructions. One control provides access to three line inputs, the phono input (MM/MC selection is on the rear, adjacent to the phono input sockets) and the tape circuit, while a press button provides off-tape monitoring while recording. The only remaining controls are an on/off switch and a volume control. There's no balance control, but there is no obvious need for one as channel balance remained accurate on the test sample



even at the lowest volume settings. Note the absence of a headphone socket, which may be regrettable on practicality grounds (in the absence of a CD player, righting this omission will require additional hardware from QED or another accessory manufacturer) but is undoubtedly beneficial sonically.

I have used different *A1*s on a number of occasions, and have never encountered any failures or operational problems, though there were reported problems in the early days, because under certain conditions the amplifier could commit hari-kiri at switch on. The *A1* is now in *Mk II* form, and the problem has been resolved by including a separate power supply for the line stage, though a residual (harmless) DC offset remains, resulting in a fair 'thump' through the speakers when the amplifier is turned on or off. Power supply ripple has also been reduced by this measure, and other subtle changes have been made, but in essence the *A1* is as always: 25 watts per channel of transistorised magic. The heavy waffle top alloy extrusion, which gets hand hot in use, is the main heat exchanger for the output devices which are biased heavily into Class A. Build quality is exceptionally high, and finish is commen-



surate, the only black mark being for the five screw holes in the top surface (later amplifiers based on this pattern have solved this problem). All in all, the £300 asking price looks like a significant bargain just in materials terms, leaving sound quality to one side.

Audio Note AN-J loudspeakers

Physically there is little to it. Modelled on early Snell designs, the AN-J is a substantial sealed box fitted with a 200mm pulp cone bass driver (which looks small for the enclosure size) and a 25mm soft dome tweeter. This unfashionable looking package is very carefully specified in all kinds of overt and subtle ways, and is built to a high standard, with real wood veneers. Bi-wire terminals are fitted, and the speakers were supplied with a pair of extraordinarily heavy sand and lead filled stands which lift the tweeter to about ear level or just above. The AN-J is designed to be used clear of walls and other obstructions and has a high rated sensitivity and power handling (given as 93dB and 150 watts respectively), the latter empirically confirmed with the help of a Krell KSA-150 power amplifier.

Sound quality

One of the eternal puzzles of the high fidelity business is how the quality of music reproduction can be treated as being separate from sound quality, almost as though there is no real relationship between the two. I cannot recall any recent example where this division is more clearly presented than it is with this system, which on the whole is musically excellent but sonically, well, a mixed blessing.

This kind of argument is hard to quantify, but just to give some idea, I don't think many would dispute that the Pioneer/Rotel/Castle system reported on separately is sonically superior to this one. It is sharper, cleaner, more detailed and more consistent dynamically in ways that are described more fully in that report.

This system, however, is the one that makes better music, and if you think that's an oblique reference to the oft-quoted superiority of vinyl over Compact Disc (leaving aside whether this superiority is or is not real) the superiority is equally evident when the record deck is replaced by a Compact Disc player (the Ariston CD3 for the sake of this report, which, as it happens, turned out

to be an excellent match).

In fact the turntable was a distinct liability in some ways. I have no quarrel with the quality of the turntable or of the arm, both of which I have praised effusively on previous occasions. Time has done little to erode their appeal: records still reproduced with genuine subtlety and finesse, with excellent layering of stereo information and a wonderful midband translucency that breathes real life into the reproduction. The cartridge has a large-scale and open midband to match, though the bass seemed a little blowsy in comparison to, say, an Audio Technica AT-F3 (an elderly MC). By substituting the amplifier for an Audiolab 8000A, I discovered that the Musical Fidelity exaggerated this tendency to a certain extent.

More seriously, record reproduction was better at low levels than when the music became denser and more complex, where the reproduction mirrored the fact by sounding cluttered and harsh, with clear signs that the cartridge wasn't fully obeying the instructions locked in the groove.

Very high level vocal passages (from the Karajan *Tosca* for example) and piano transients (Nimbus Bernard Roberts direct cut

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Beethoven *Piano Sonatas*) caused clear signs of mistracking. Naturally the cartridge was first run in, and tracking force was optimised by ear after being set by the book using Shure stylus scales. Increasing tracking force reduced mistracking to a degree, but not completely, and the sound became heavier and less 'fluid.'

At the same time, the bass end never had the natural evenness and extension that I felt the system demanded, and that Compact Disc certainly provided.

In fact I was able to confirm by substitution that the combination of the Musical Fidelity and Audio Note are not well served by records unless and until you get up to Roksan *Xerxes* standards. (I briefly tried a Roksan *Xerxes/Shiraz/Artimez/Artaxerxes* player, the latter providing a line level output which I connected directly to the amplifier's tape input.)

Now we get to the good bits. The amplifier may seem rather small for speakers like the Audio Note, but in practice the *A1* maintained a firm grip, and drove them to volume levels that, even with the most unfavourable material (piano and percussion because of the high peak to mean voltages involved), were still capable of raising the roof in a fairly large listening room. A bigger amplifier confers certain advantages, for example in the ease with which high levels are reproduced, especially in the deep bass area, but the two tested here are technically compatible.

They're also musically compatible, though neither could be accused of being strictly neutral. The Audio Note has an extremely accurate midband, and a treble that is perceptibly smoother than many rivals, but it lacks a touch of air and detail, a tendency slightly exaggerated by the *A1*'s midband dominant balance.

At the same time, both products err from the straight and narrow in the bass. The *A1* is warm and effusive in the LF, though it carries it well, merely sounding more than usually open and generous in scale. The *AN-J* gives every indication of having a poorly suppressed LF resonance, which means that it tends to be selective, favouring certain instruments and certain notes within each instrument's compass more than others. It is also rather slow, and lacking in depth and detail.

Musically, then, the system is a little



rounded, but any unevenness is soon forgotten: despite the qualities already mentioned, the bass has a kick on it like a mule, and for much of the time is extraordinarily tactile.

Put this welter of almost contradictory impressions together and you get a sound that, although lacking the last ounce of top end clarity, has a great deal in its favour. It has considerable finesse, an immaculately presented midband and a bass that dynamically really means business, though it is by no means 'fast' or especially tuneful. The open LF means that the turntable needs to be extremely solidly mounted or the bass cone will wobble like a leaf in a storm, soaking up ELF headroom in the speakers and amplifier alike.

Compact Disc extended the system's capability another octave by providing greater extension and control, and this is just what was required.

Conclusion

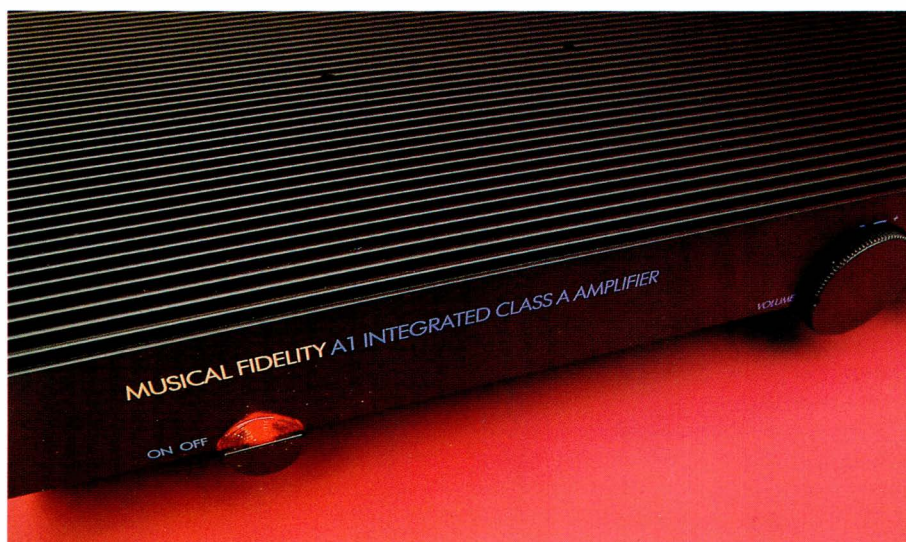
Two of the three major components, namely the amplifier and the loudspeakers, have a clearly detectable personality, and while this doesn't disbar them from the ranks of the

great and the good, it does mean that unusual care is needed to make them sing. This system gets close, but it has the effect of exaggerating the limitations of what, after all, is a near budget turntable. As it stands then, this cannot be said to be a well matched system.

I've already indicated how this might be put to rights. Ideally it needs a higher powered turntable. The Roksan *Xerxes* worked well on test, and I've no doubt that a good Pink, Elite or Linn *LP12* (especially with the *Trampolinn* base) would perform to a comparably high standard, the Elite perhaps best of all, though it is far from being the most accessible high-end turntable around.

If you don't make this kind of substitution, the system is perhaps more convincing when driven by a Compact Disc player such as the Ariston *CD3*, though some of the thinner, more anaemic players should be avoided.

For all their idiosyncrasies, the Musical Fidelity *A1* amplifier and Audio Note *AN-J* loudspeakers bring something special to the art of music reproduction. I found the combination was unusually organic and expressive in its responses, and a distinct contrast to the slightly inarticulate and wooden feel of the similarly priced Pioneer/Rotel/Castle system referred to earlier.



GENERAL DATA

Turntable £295 inc arm (cartridge £90)
 Speeds 33, 45 rpm, manual speed change
 Cartridge MM, interchangeable stylus
 Dimensions 46x47x37.5cm (hwxwd/lid clearance at rear)

Amplifier £300
 Power output 25 watts/channel
 MC cartridge compatible yes
 No of inputs (ex tape) 4
 No of tape circuits 1, with off-tape monitor
 Dimensions 37x6.5x25 (wxhxd)cm

Loudspeakers £799 (stands optional)
 Type 2 way sealed (1B)
 Recommended placement stands, clear of walls
 Impedance 8 ohm
 Sensitivity 93dB
 Power handling 150 watts (approx)
 Dimensions 38x58x25 (wxhxd)cm

MAKING THE MOST OF RADIO



To get the best from your tuner it's essential to provide it with a decent signal. Richard Black explains what you should be looking for when it comes to choosing an aerial.

Every type of hi-fi source has its advantages and disadvantages. With radio, the obvious advantage is that it's free; the main technical disadvantage is that you have to snatch a signal from the air and process it to extract the programme you want to listen to.

While it is often true that a better tuner gets better results, there is the added complication that the radio signal you want to pick up varies in strength and quality from place to place, from day to day and even with the weather. A radio which is struggling to pick up a poor signal is second in annoyance value only to a rare record which someone has played with a blunt chisel. But even when things seem reasonably OK there is often plenty of room for improvement.

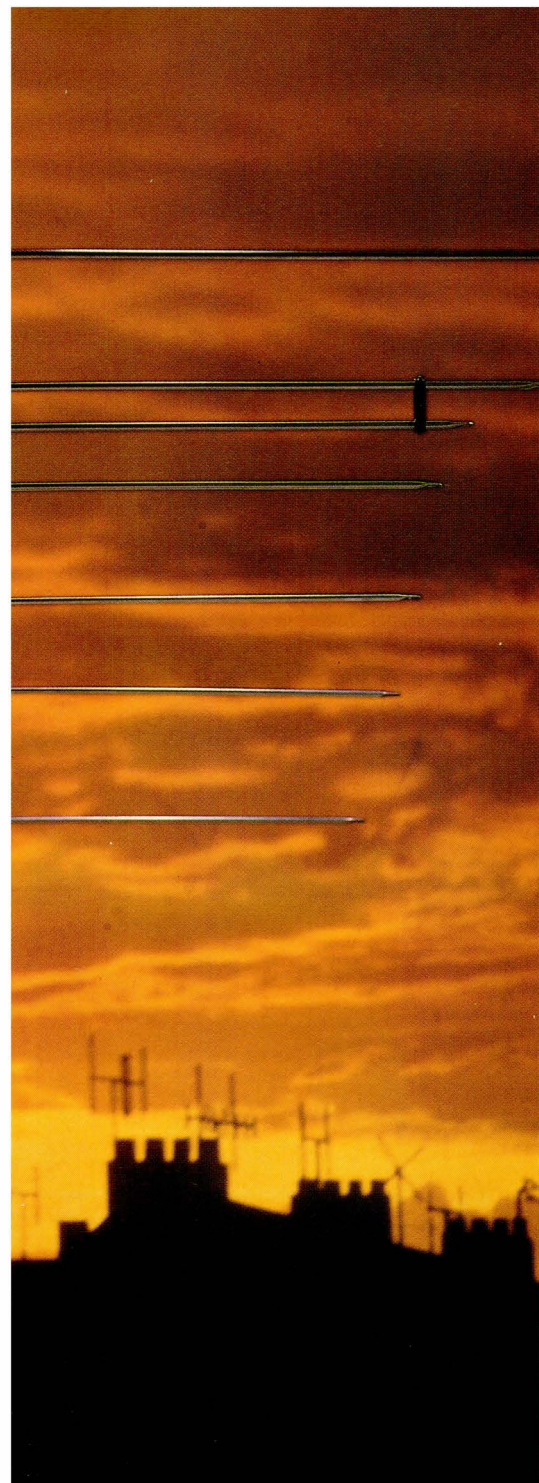
Actually, radio's reputation as the 'poor relation' of LP and CD is largely undeserved. One hears all sorts of criticisms levelled against it, some of which are undoubtedly true (for example, prime-time pop on many stations is certainly heavily compressed), while others are irrelevant or misdirected. Basically, radio broadcast quality is intrinsically similar to most modern recordings, since similar recording techniques are employed and the transmission medium is only slightly inferior to CD in terms of bandwidth and noise performance.

There is doubtless room for improvement on the broadcast front, but a good, carefully chosen tuner/aerial system can provide sound quality comparable to a good commercial recording.

You will notice I carefully specified a good tuner/aerial *system*; the simple rule with tuners is GIGO — Garbage In, Garbage Out. It cannot be stressed too strongly that any radio will perform badly if it is fed from an inadequate aerial. If you want to hear radio properly, get a good aerial.

Plucked from the aether

Radio signals travel as 'electromagnetic waves', spreading out from the transmitter like ripples in a pond and getting weaker as they go. These waves can be reflected off solid bodies, including the ground, although to an extent they can also pass through thin bodies such as walls, and they can be diffracted ('bent') around obstructions as well. Given that the waves spread out in space, it seems



are responsible for coarse and splashy treble and excessive sibilance. The problem is so widespread that many people assume radio always sounds like that, but it can usually be cured by using a more directional aerial, which doesn't respond to the reflections since they arrive from the side rather than straight in front of the aerial. As it happens, larger aerials with more gain are generally more directional than smaller ones. The extra directionality of a good aerial can also help cut down the effects of interference, if this is a problem.

So as a simple rule, a good aerial should be as physically large as possible, and should be positioned outdoors and as high as possible, in order to be well away from sources of reflections. This isn't always possible, and some alternative options are mentioned later; but let's first look at how to go about selecting and installing a good outdoor aerial.

What sort of aerial?

Only if you live within sight of a powerful transmitter will you get anything like decent results with the nasty little 'ribbon' aerial that is normally to be found in the box along with your new pride and joy. If you want to get the best from a decent tuner, you will need to move at least a couple of rungs further up the aerial upgrade ladder. If you live in a primary service area, a three element aerial on the roof will be fine as long as there is no multipath distortion, but a five or seven element device may well improve things if there is no direct line of sight to the transmitter.

If you live more than twenty miles or so from a high power transmitter, or less from a low power one, you will almost certainly benefit from an aerial with five or more elements. And if you are in a difficult reception area (for example, surrounded by hills) you may need a monster array with at least ten elements in order to enjoy clean stereo sound.

Unless you particularly enjoy climbing ladders and hanging on with your teeth while you try to fix Rawlbolts in flaky brickwork, aerial installation is best left to a professional aerial installer. For one thing, he will have all the tools and bits and pieces that you will otherwise have to hire or buy specially, and he will be familiar with the job in hand and its problems. He should also be insured against damage to your premises, and, in the very unlikely event that the aerial comes down in the next breeze, you will at least have someone to sue.

However, do bear in mind that most

aerial installers do far more work with TV aerials than with radio, and may not be too sure of exactly what is required. It is therefore worth doing a little bit of background research to find out what you need, so that when you contact the installer you can specify the aerial type, location and orientation. If you also make it clear that you want the aerial at least six feet above the roof level (about right for an FM aerial), the installer is more likely to turn up with all the right bits in his van and leave you with a thoroughly satisfactory job.

Unlike the situation with TV, the BBC and the independent stations do not share transmitters but each have their own sites. So in my case, for example, I have to point my aerial East-South-East to pick up the BBC from Wrotham, but South to pick up independent stations from Croydon. Since I also suffer from multipath distortion thanks to the many tower blocks in my area, a directional aerial is essential, but this can't pick up a good signal from both transmitters.

There is only one solution to this dilemma, which is to fit an aerial rotator. This device consists of an electric motor and some gearing on the aerial support shaft, and a small control unit in the living room with which one can dial up any aerial position. Having established the locations of the relevant transmitters and their bearing from your home, you just turn a knob on the controller to the appropriate position and the aerial duly follows. Simple, but it costs money (about £40) and requires an extra cable to link the two parts.

As a guide to costs, I recently had a five element aerial installed, on a rotator, on the roof of my two-storey house. The job was done neatly and quickly by an installer chosen from the Yellow Pages on the basis that he was nearby and was helpful when I phoned him, and he charged £186 for parts and labour. A seven element aerial would be about £15 dearer. If you want something bigger than that, you may have to go to a specialist such as Ron Smith Aerials of Luton (0582 36561), who can supply standard aerials with up to 23 elements. This would cost £125, but suitably robust masts, guyropes and rotator could easily add another £300, and installation is liable to cost a good bit (at £30 an hour, for what could easily be a day's work).

If you'd like to buy an aerial and install it (or arrange installation) yourself, Antiference of Aylesbury (0296 82511) is a leading manufacturer which sells a range

pretty logical that a physically larger aerial will scoop up more of them than a small one, thus producing a stronger signal for the tuner, and this is by and large true, given of course that the aerial is appropriately designed.

If the signal is simply not strong enough, you'll get hiss, which will generally be much worse in stereo than in mono. Although some tuners have a signal strength indicator, these indicators can be a bit on the optimistic side, so don't assume that the signal is adequate just because the meter says so.

At least as common as a weak signal is multipath distortion. This occurs when the received signal includes reflections off the ground or buildings, which add in and out of phase with the main signal and



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of its own designs as well as providing useful information on the subject.

What if you can't install an outdoor aerial, or you don't want to go to the trouble and expense of having a rotator fitted? In the first instance, you may just have to put up with less than perfect reception, using either a ribbon aerial or one of the neat 'active' aerials that are available. With either of these, try as many different positions and orientations (vertical and horizontal) as possible, bearing in mind that positions near an outside wall may be preferable, while proximity to any kind of metal object is often detrimental.

In the latter case, you may be lucky and live in a location where both BBC and independent radio transmitters are in roughly the same direction (up to 60° apart is OK with a typical three element aerial), or of course you may only ever listen to one or the other. Otherwise, there is usually the option of a single element aerial mounted vertically (sold by Antiference as the *Radio Rod*). This only has limited gain, but it receives equally from all sides. Of course, it has no rejection of multipath interference from the sides, but it can often be conveniently mounted on an outside wall.

Radio aerials are normally mounted horizontally, because transmissions used to be mostly 'horizontally polarised'. However, in order to cater better for car radios, many transmitters now use 'vertical polarisation' or 'mixed' — both vertical and horizontal. For this reason, the vertical aerial is likely to pick up a reasonable signal from most transmitters. Alternatively, Antiference also makes an aerial called the *Allrounder* which picks up horizontally polarised signals from all sides. However, this has very limited gain (and no immunity to multipath), and a vertical aerial is likely to be better in many cases.

Further information

I'm afraid all this business of transmitter location and polarisation is a bit confusing. However, at least some help is at hand.

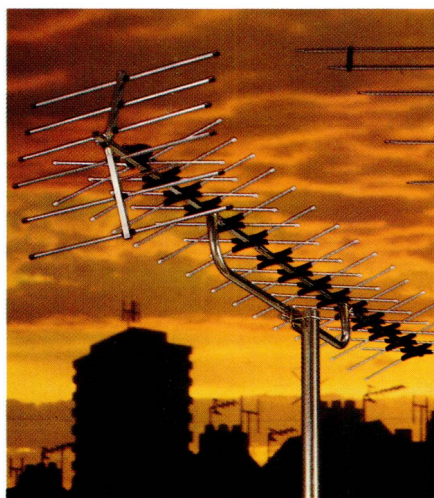
One of the most useful sources of information I've found is the excellent catalogue published by Maplin Electronics. This is obtainable from some large newsagents or from Maplin (0702 554161) for £2.45, and lists all FM radio and TV transmitting stations in the UK, giving location, frequency, polarisation and output power for each. Armed with this and a map and compass, one should have little difficulty in pointing an aerial at least roughly the right way (fine-tuning the process by listening, if possible). Maplin also sells aerials and mounting gear, if

you fancy having a go at some DIY.

The BBC has an Engineering Information Department which exists to help people tune in to BBC programmes. It produces a range of leaflets covering everything from transmitter details to RDS to making your own aerial, and it also offers a service for tracking down the cause of specific reception problems, even down to visiting your home with a survey vehicle if the problem is a tricky one. Engineering Information can be contacted on 081 752 5040. Advice on independent radio is sadly not so readily forthcoming and is effectively the responsibility of your local radio stations.

Your local hi-fi dealer may be quite knowledgeable, as may a local aerial installer, but don't count on either.

Once you've got your aerial sorted you



may think that is the end of the story. And it would be were it not for interference. This can take many forms, most of which (such as 'pirate' stations near the frequency of the station you are trying to listen to) can be sorted out with a good aerial and tuner, but one rather common cause is car ignition. This sounds a bit like an engine, not surprisingly, and is often picked up not by the aerial itself but by the cable leading to the tuner. It is worth fitting 'double screened' cable to help avoid this, despite the extra expense involved (50p per metre against 25p). Using the *Hi-Fi Choice Purifiers* on the aerial cable may also help. Sometimes, interference can be caused by CB radio sets, even occasionally by ham radio (less common, since hams tend to know what they're doing!), or by industrial equipment.

In severe cases, the Radio Investigation Service of the Department of Trade and Industry may be able to help, as it has legal powers to deal with sources of interference. Aerial installers and suppliers should be able to provide interference-rejecting filters to fit in the aerial downlead.

It is possible to get a 'masthead amplifier' to amplify the signal from the aerial before sending it down the cable. Although this may look like an attractive option, it is really only suitable for boosting the signal level either to drive a very long cable with significant loss (about 25m or more), or to drive a splitter unit to feed more than one tuner. Even if your tuner is a little 'deaf', it is usually true that any aerial capable of providing a multipath-free signal will produce plenty enough output.

All of which brings us, eventually, to the humble tuner itself. One point to arise from the reviews that follow, and indeed from our previous experience with the breed, is that there can be a trade-off between 'sound quality' and RF performance; I use quotation marks, since if RF performance is inadequate for the circumstances, the first thing to suffer will be the sound. Tuner selection therefore depends on location as much as anything else, and as a very rough guide it is worth looking out for a tuner with relatively poor stereo separation for use in poor reception areas; better to have compromised separation than hiss and distortion. High sensitivity is of course useful for picking up rather distant stations.

Most modern tuners are 'digital', using a synthesised reference signal. Although this is very stable and almost incapable of drifting off station, it usually (except inexpensive tuners such as Revox) means that frequency steps between stations are rather coarse, while an analogue tuner can be tweaked between channels to minimise interference or improve distortion. However, even analogue tuners these days use a 'varactor' instead of a mechanically variable capacitor for tuning, which limits RF signal handling, especially at the 88MHz end of the scale, and with very strong local stations a signal attenuator may even be required. If you live fairly near a transmitter and still suffer from harsh radio sound, an attenuator is at least cheap and simple to try. Mechanical capacitor tuning is intrinsically superior to varactors in many ways, but more expensive to make.

Conclusion

If you've read this far you will, I hope, have got some idea of why I think radio is a medium unduly neglected by many of the people who stand to gain most from it.

This assumes that there are programmes you want to listen to, but there is something for almost everyone and more arriving weekly, and given that criterion, radio is like any other hi-fi component; the more you put into it, the more you get out of it.

Akai AT-56L

Akai (UK) Ltd, Unit 12 Haslemere Heathrow Estate, Silver Jubilee Way, The Parkway, Hounslow, Middlesex TW4 6NQ. Tel: (081) 897 6388



Given its price, this tuner looks a bit like an exercise in providing features per pound; it has switchable IF bandwidth, two aerial sockets, MW and LW AM bands and my very favourite, direct frequency entry. This involves pressing a button marked 'direct', then using the preset buttons to set the exact station frequency required. If you can remember the station frequency, it will save quite a lot of time that would otherwise be spent leaning on the tuning up/down buttons (and if you can't remember the station frequency, you could always try an RDS-equipped tuner, I guess). There is also an automatic high blend feature. For some reason, the review sample omitted the 'L' designation on the front panel label, so if long wave matters to you, perhaps you had better check that the AT-56 you are buying actually has it!

Inside the AT-56L is the usual selection of decoding ICs, fed from an Alps front end. All the RF and audio circuitry is on a single circuit board, surrounded by a lot of fresh air. The front panel, with its various indents and raised bits, seems a bit fussy but is quite smart.

Lab report

Test results are about par for the course. The frequency response is a little way off perfectly flat, enough to add a touch of coloration in comparative listening but not enough to be uncomfortable. Stereo separation falls off in the bass, and the crosstalk signal at any frequency is rather distorted (up to about 12 per cent).

Pilot and subcarrier tones are very well suppressed, both with and without audio signal applied, though as usual there is a considerable breakthrough of intermodulation products when high frequencies are reproduced.

RF interference rejection is quite good, the alternate channel selectivity improving, of course, in narrow IF mode.

Sound quality

The listening panel seemed a little undecided on this one. The Victoria choral selection was well liked, although a brief comparison with the CD direct to the preamp showed that the Akai was not strictly accurate in its tonal balance. Solo piano sounded rather dead and wooden. In the jazz track, the drums came over well with good impact, while cymbals lacked a realistic decay, tending to cut off too abruptly. Overall, the conclusion was that the sound was quite listenable but not likely to get anyone very excited.

That is exactly how I felt after listening to a selection of live broadcasts via the AT-56L. It is one of those hi-fi products that do nothing obviously wrong, but nothing dramatically well either, and while it didn't give me any strong urge to turn it off, I never felt too bad about leaving the room to make a cup of coffee while it was playing.

With rock music programmes, it puts out a beat that one can follow but which isn't exactly driving, and with classical music there is enough information to build up a fairly clear aural image, but the AT-56L required careful listening and sometimes a little inspired imagination to fill in the background, which the best tuners can reproduce more clearly.

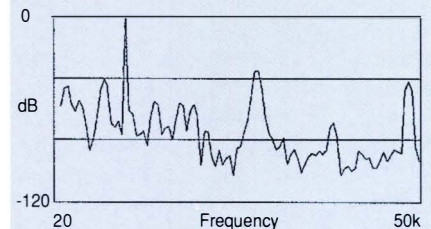
On AM, the sound was rather muffled though not as bad as some, the midrange was clean and the bass quite free of the chestiness that so often affects AM tuners.

Conclusion

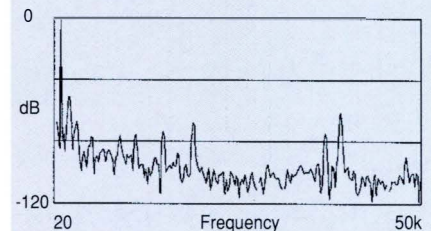
Features it may have in plenty, and indeed some rather useful ones, but the sound quality of this tuner has more in common with models which are quite a lot cheaper. If you want background FM reception, arguably £170 is more than you need to pay for it, and I feel that recommendation just slips by the AT-56L, but with a special mention for the features, if you need them.

TEST RESULTS

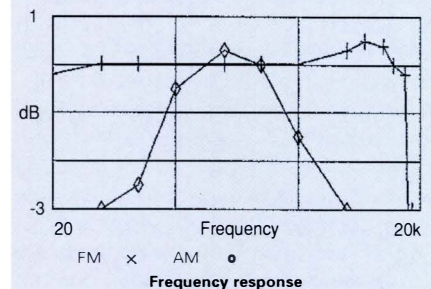
Muting threshold	3 μ V
Sensitivity	
50dB S/N (mono)	5 μ V
50dB S/N (stereo)	33 μ V
65dB S/N (stereo)	110 μ V
Ultimate S/N ratio,	
mono	78dB
stereo	74dB
Stereo Separation,	
20kHz	27dB
1kHz	38dB
15kHz	26dB
Harmonic distortion	
(1kHz, 100% mod, stereo)	0.2%
19kHz pilot level	-60dB
38kHz subcarrier level	-73dB
Alternate channel selectivity	55dB
Second channel rejection ratio	70dB
10 x IF rejection	>80dB
AM rejection ratio	58dB
Maximum output	
(100% modulation, 1kHz)	900mV
Typical retail price	£170



Distortion with 10kHz signal at 100% modulation



Distortion with 1kHz signal at 100% modulation

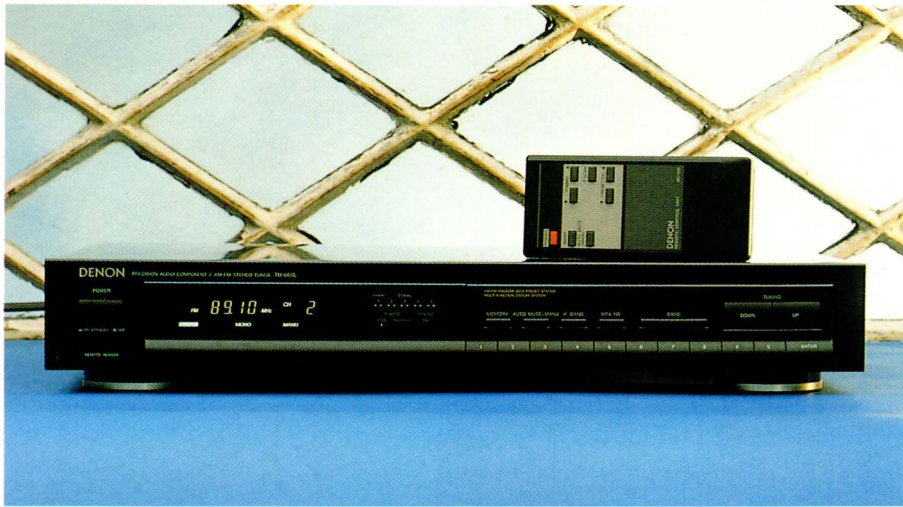


Frequency response



Denon TU-660L

Hayden Laboratories Ltd, Hayden House, Chiltern Hill, Chalfont St Peter, Gerrards Cross, Bucks SL9 9UG. Tel: (0753) 888 447



Denon's *TU-660L* is one of the most successful budget tuners around, and the *660L* doubtless hopes to build on its strengths.

Features are similar though a little more extended; in particular, in addition to its 30 preset stations, the *TU-660L* offers switchable IF bandwidth and, unusually, a remote control as standard. As the 'L' designation implies, it is a full three band unit.

Internal inspection of the *TU-660L* shows that it is a fairly conventional design, occupying a rather cramped circuit board. The RF part of the circuit is Denon's own design, and it is followed by a selection of familiar integrated circuits in the decoding and demultiplexing sections. There is a signal strength indicator of the most optimistic sort, fully illuminated at a (nearly useless) 200µV.

Lab report

Lab results are pretty similar to the *TU-260L*, with good RF sensitivity and rejection of interference, good signal/noise ratio and very good stereo separation. That small rise in the high treble is probably just about sufficient to account for at least some of the forwardness noted in the sound.

Pilot and subcarrier tones are well suppressed, although some modulated subcarrier is evident in the 10kHz distortion plot. These tests tie in well with the subjective impression that the RF sections are better than the AF, where such things as the none-too-wonderful output op-amp definitely take their toll.

Sound quality

Auditioned at the start of the blind tests, the *TU-660L* didn't do too well. Its sound was found to be a bit bright and forward, with rather lumpy bass. In the very difficult Victoria choral music excerpt, everything seemed at a remove and the choir sounded somehow hollow.

Ironically, it managed to combine its brightness with a feeling that very high treble was rolled off. In our auditioning of the jazz track, the drums were quite strong and clear, although the double bass was very hard to follow.

Listening 'off air', I obtained somewhat similar results, although this was rather more encouraging. The *660L* shares with the *260L* the ability to extract a clean signal from real live, multipath-infested RF without squashing the music flat in the process, a common failing of cheap and mid-price tuners. In other words, although it didn't sound better live than with a laboratory generator hooked up, it didn't sound worse, which puts it a step ahead of some designs which work nicely until the going gets tough, and then fall over.

I was able to listen for extended periods to Radio 3 without discomfort, while the tuner's natural and realistic presentation of speech made Radio 4 just as listenable. On the odd occasion when I managed to locate a good quality rock broadcast, I felt the music could have sounded just a little more vigorous, less muddled. But the overall impression was quite favourable. AM sound is rather better than the (poor) average for the type, with quite good clarity and less chestiness than is common.

Sensitivity here seems a little below par, but is still satisfactory, and interfering whistles are bearably low.

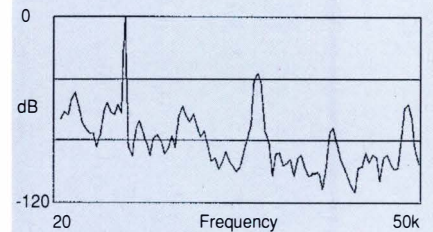
Conclusion

By no means the same sort of runaway success as its cheaper sibling, the Denon *TU-660L* nevertheless seems to put up a pretty good fight in the real world, even if its ultimate performance can be bettered by some of its competitors.

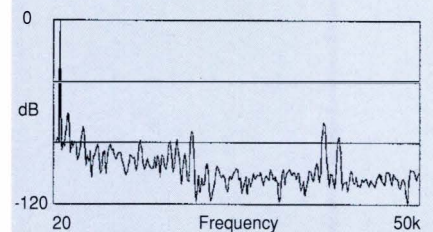
The price is very reasonable for the facilities and performance offered, and it would be a harder man than I who would deny it Recommendation.

TEST RESULTS

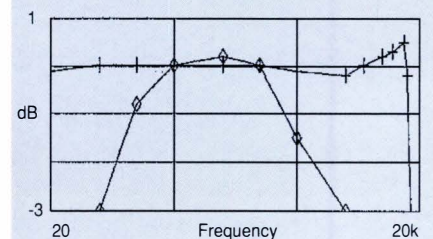
Muting threshold	5µV
Sensitivity	
50dB S/N (mono)	2.5µV
50dB S/N (stereo)	22µV
65dB S/N (stereo)	110µV
Ultimate S/N ratio	
mono	78dB
stereo	74dB
Stereo Separation	
20Hz	53dB
1kHz	53dB
15kHz	34dB
Harmonic distortion	
1kHz, 100% mod., stereo	0.12%
19kHz pilot level	-68dB
38kHz subcarrier level	-75dB
Alternate channel selectivity	55dB
Second channel rejection ratio	>80dB
10 x IF rejection	>80dB
AM rejection ratio	67dB
Maximum output (100% modulation, 1kHz)	1.2V
Typical retail price	£190



Distortion with 10kHz signal at 100% modulation



Distortion with 1kHz signal at 100% modulation



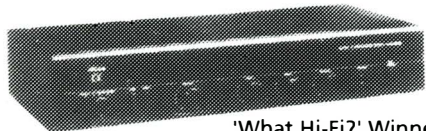
Frequency response

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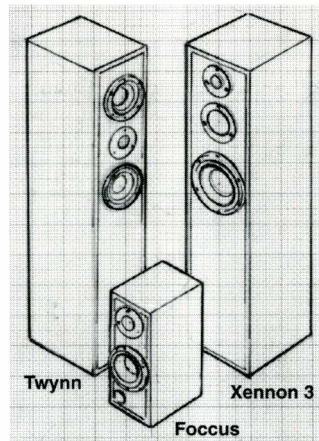
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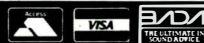


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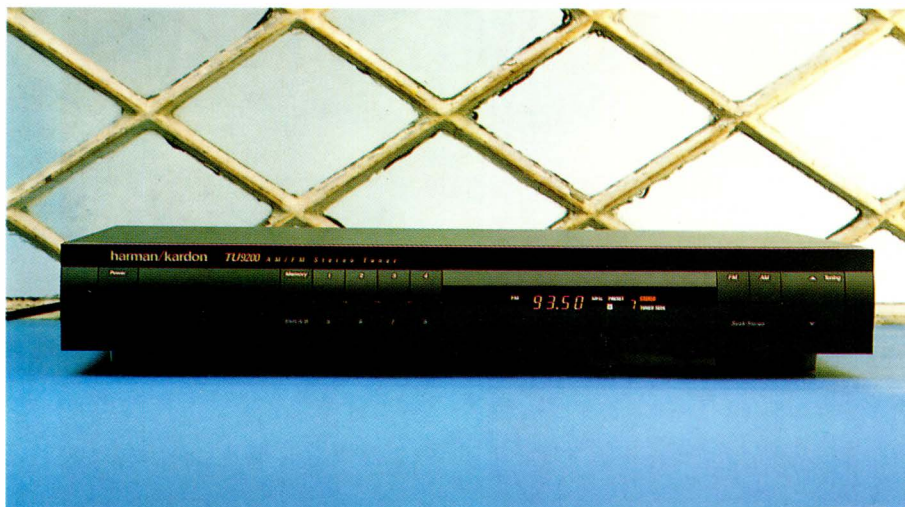
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Harman Kardon TU9200

Harman Audio, Unit 1B, Mill Street, Slough, Berks SL2 5DD.
Tel: (0753) 576 911



The sleek, curved front panel of the *TU9200* is distinguished from the dearer *9400* (reviewed in the supplement to issue 93) only by the absence of a high blend button. However, further investigation uncovers more differences in that this unit has fewer presets (16 each for AM and FM, as against 24), no LW facility and lacks the *9400*'s signal strength meter.

The essential guts of the *TU9200* consist of a single, neatly laid out board containing a Mitsumi RF front end and pretty much the minimum number of components for respectable stereo reception, plus of course the AM section.

Operation is quite easy, thanks to the very fast seek tuning, which scans the FM band in about 15 seconds. Sockets are provided for use with a system remote control. Oddly, there appears to be the facility for half-step (25kHz) fine tuning, though this is not mentioned in the manual.

Lab report

The *TU9200* turned out to have some major problems in the lab, the most serious being the fact that after taking account of the tuner's de-emphasis, the 19kHz pilot tone is effectively passed through unattenuated. Also, it shows considerable intermodulation with the subcarrier, leading to an effective intermodulation figure of over 20 per cent. Treble response is rolled off enough to be audible, and high frequency channel separation is rather limited.

S/N ratio appears a little worse than normal, but that may be in part due to the problem of obtaining a reading uncorrupted by pilot breakthrough. Still, RF performance seems fine, with textbook sensitivity and good interference rejection.

Sound quality

With locally generated RF from the CD player, the listening panel reacted to the *TU9200* with rather mixed feelings. On the positive

side, one panelist expressed appreciation of its 'pace and timing', and in the very lively jazz track from Miles and Coltrane the sound had good foot-tapping potential.

However, when clear bass definition was required the H/K fell somewhat short of perfection, making it rather hard to follow the bass instruments in a string orchestra and blurring the lower registers of a piano. There was a suspicion voiced that the treble was slightly tailored, as it sounded a little too smooth.

Live broadcasts gave a similar picture, with the bass rather unclear, and while the treble was both smooth and quite sweet, it had lost some of its cutting edge. Complex textures became slightly homogenised and confused, although by listening hard it was possible to pick out all the strands.

The crunch for me, unfortunately, is that, as previously mentioned, the 19kHz pilot tone is almost completely unsuppressed by the *9200*. As I can still hear 19kHz, I found the tuner almost unlistenable.

With most tuners, the pilot tone is just about audible, but when it is this high in level it is a real pain in the ear.

AM reception is reasonably free of all forms of interference, but also of almost all treble, and very chesty with it, making even speech tiring to listen to.

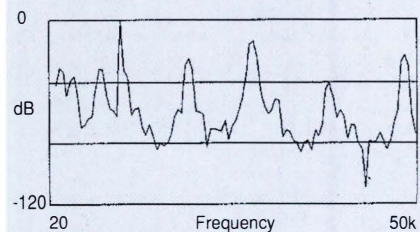
Conclusion

After the *TU9400* did so well in tests around a year ago, it seems a shame that the *9200* should bomb, but unfortunately the listening panel had limited enthusiasm for it, I strongly disliked it and it doesn't measure too well.

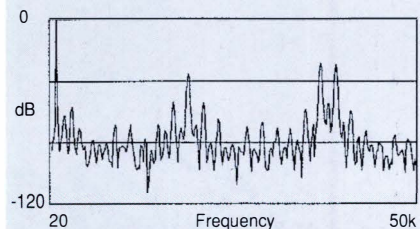
A second sample, obtained from the Harman Audio warehouse, performed just the same, as did a third sample tested by the company itself. Harman in the USA was unable to offer any enlightenment, so I guess this must just go down as the one that got away.

TEST RESULTS

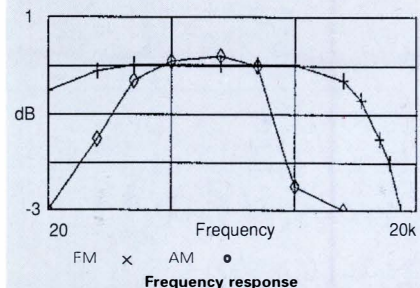
Muting threshold	12µV
Sensitivity	
50dB S/N (mono)	6µV
50dB S/N (stereo)	38µV
65dB S/N (stereo)	120µV
Ultimate S/N ratio	
mono	75dB
stereo	69dB
Stereo Separation	
20Hz	42dB
1kHz	45dB
15kHz	20dB
Harmonic distortion	
1kHz, 100% mod., stereo	0.15%
19kHz pilot level	-33dB
38kHz subcarrier level	-41dB
Alternate channel selectivity	63dB
Second channel rejection ratio	>80dB
10 x IF rejection	66dB
AM rejection ratio	54dB
Maximum output (100% modulation, 1kHz)	960mV
Typical retail price	£170



Distortion with 10kHz signal at 100% modulation



Distortion with 1kHz signal at 100% modulation



Frequency response

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NAD 4225

NAD Marketing Ltd, Adastra House, 401-405 Nether Street, London N3 1QG. Tel: (081) 343 3240



NAD has built its reputation on the basis of quality audio electronics in relatively simple packaging, and the 4225 tuner evidently aims to continue the line; the front panel is admittedly simple, perhaps even dated, in appearance, but is it any more offputting in appearance than its more up to date rivals? I don't think so, and it is certainly less confusing.

Features extend to fourteen presets, switchable mono and high blend, and search tuning. Tuning is indicated by three LEDs, up, down and spot-on. AM reception covers only MW.

I'm glad that NAD's reputation for reliability is good, as I should not like to be asked to service the 4225; frankly, the main circuit board is a mess. Components are jammed together, mounted at crazy angles, with wires running hither and yon right over the top of everything. At least all the adjustable components are accessible.

A Mitsumi RF front end is used, and the IF strip is quite sophisticated. In fact, the circuit seems to be generally a thorough piece of design; it's just been sneezed on to the board!

Lab report

Although audible interference was no problem, a couple of surprises showed up in the lab, particularly the level of breakthrough from an interfering signal at 106.7MHz (tenth harmonic of the IF), which caused -50dB of breakthrough at an RF level only 20dB below the wanted signal. That's bad, and a possible real problem when commercial stations start broadcasting on that frequency. Second channel breakthrough is not wonderful but probably quite adequate in practice.

Audio performance is pretty good, especially the ruler-flat frequency response.

Harmonic distortion is quite good, but intermodulation with subcarrier and pilot signals breaks through at a rather high level

(around -35dB). Sensitivity, S/N ratio and crosstalk are all fine, if not stunning.

Sound quality

In the panel listening tests, the 4225 was quite a popular performer. The point was made that it added a little grain, even scratchiness, to orchestral violins, but solo piano came over very well, with good attack and clear bass. In the extract from Victoria's *Tenebrae Responsories*, the unaccompanied voices sounded somewhat coloured in a quite different way to any of the other tuners we tested, although this effect was really quite subtle.

Listening to concert broadcasts on Radio 3, I found the 4225 to be a very successful tuner all round. FM tuner design is largely based around the compromise between ultimate sound quality and rejection of interference, but NAD seems to have advanced the whole equation a worthwhile distance. Interfering whistles are kept to a gratifyingly low level, while the sound possesses a free and open quality which makes long-term listening, even at high levels, a pleasure.

The coloration noted above is still there, but it is of the euphonic variety and unlikely to cause too much offence. As for scratchy violins, well, yes, maybe — but only very slightly — and the lack of interference more than makes up for it in most practical installations. Overall, a very favourable impression; essentially, it's enjoyable.

Even AM reception sounds almost respectable, with at least some treble and lowish interference, although it's all a bit homogenised. AM sensitivity seems very good.

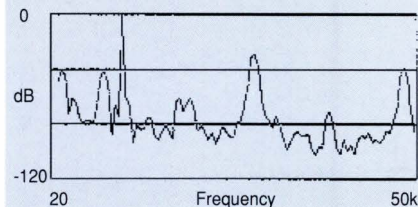
Conclusion

Noting its price, I cannot resist giving this tuner a Best Buy; but at the same time I must underline that potential interference problem and hope that NAD will be able to fix it soon.

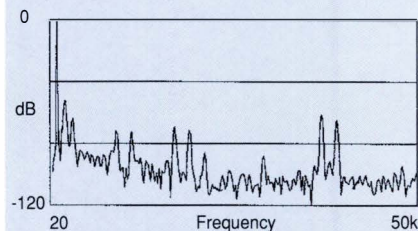


TEST RESULTS

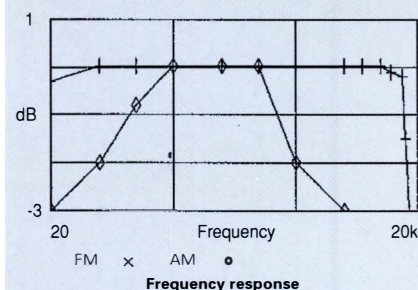
Muting threshold	1µV
Sensitivity	
50dB S/N (mono)	2.5µV
50dB S/N (stereo)	22µV
65dB S/N (stereo)	150µV
Ultimate S/N ratio	
mono	79dB
stereo	74dB
Stereo Separation	
20Hz	38dB
1kHz	45dB
15kHz	34dB
Harmonic distortion	
1kHz, 100% mod., stereo	0.3%
19kHz pilot level	-70dB
38kHz subcarrier level	-63dB
Alternate channel selectivity	64dB
Second channel rejection ratio	68dB
10 x IF rejection	20dB
AM rejection ratio	53dB
Maximum output	
(100% modulation, 1kHz)	950mV
Typical retail price	£160



Distortion with 10kHz signal at 100% modulation



Distortion with 1kHz signal at 100% modulation



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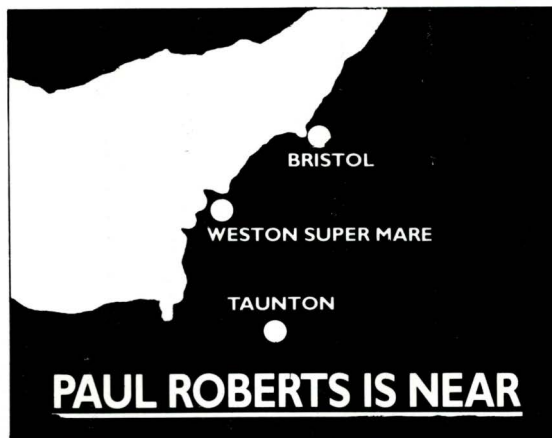
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Pioneer F-676

Pioneer High Fidelity (GB) Ltd, Field Way, Greenford, Middlesex UB6 8UZ. Tel: (081) 575 5757



Pioneer advertises this tuner as using the same 'Digital Direct Decoder Type IV' as its flagship *F-93*. I haven't quite managed to decode Pioneer's guff on this particular technological marvel, but it certainly isn't a device for generating CD-style digital audio straight from the aether (though that will come in time, just watch). However, full marks to Pioneer for filling this tuner with the greatest number of own-brand ICs, with the implication that we may in fact have here a departure from the general trend in tuner design.

The *F-676* really is very comprehensive at the price. It has two aerial inputs, switchable IF bandwidth, high blend (aka MPX NR), switchable RF attenuation and 'Spectrum Simulated Stereo', to give a sort of stereo-ish effect with mono AM or FM broadcasts. 36 presets are shared between the two bands (it does not receive LW). Pioneer's own RF front end is used. Scan tuning is a little unusual in that it will not begin until a tuning button has been held down for a couple of seconds, and then it proceeds rather slowly. As so often, the signal strength meter is of largely decorative value, fully lit below 200µV.

Lab report

Pioneer's extensive use of custom ICs appears to be vindicated by the test results, which are on the whole very good. Breaking that rule, however, is the finding that full level left-plus-right signals (ie, both channels in phase, as indeed they tend to be at low frequencies) below 45Hz overload the decoder, giving rise to a very peculiar clipping distortion.

Such signals are not often found in practice, but reggae lovers might find it a problem. Distortion is quite low, especially high frequency intermodulation and breakthrough, which is the best of the tuners tested here, thanks perhaps to Pioneer's output filtering, which is rather more com-

prehensive than usual. Rejection of RF interference is not great but is adequate for almost all real conditions.

Sound quality

Discussion on the *F-676* centred on whether its treble was over-bright or merely well extended. Generally, it was felt to be just a touch too strong in the upper reaches, which made it sound hard on occasion, but it was also very clean sounding which prevented it from becoming rough or fatiguing. Imaging was very good, especially in the Victoria choral music. Here, the voices were perhaps not perfectly natural in tone but quite close to the original and very credible, taken in isolation.

In the Bach violin concerto, the continuo was clearly audible when required, rather than permanently submerged as happened with some of the other tuners we tested, and the solo piano was solid and clear. A good result overall.

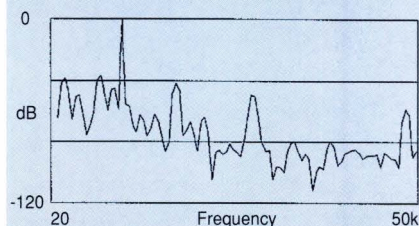
Perhaps this success did not carry over absolutely unblemished under real reception conditions, but the tuner's sound was still quite impressively lifelike. Imaging fell slightly short of the high standard achieved with the simulated broadcast but was still good, while, at least with opera, the treble hardness became if anything more pronounced. Music for small ensembles, on the other hand, both classical and non-classical, sounded free and open in the treble, and in all cases the bass was clear and very well defined. AM sound was very muffled, though at least reasonably natural in the bass.

Conclusion

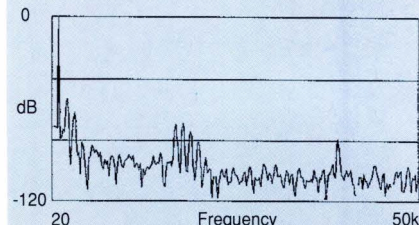
Never mind the fancy jargon and silly fake stereo facility, this is clearly a very capable tuner with decent performance in AF and RF departments, and a good set of features. In every way good value for money, it clearly deserves to be Recommended.

TEST RESULTS

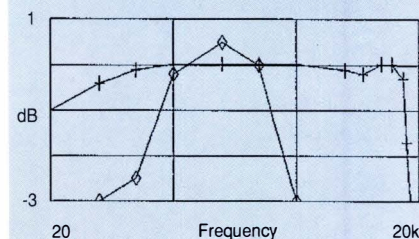
Muting threshold	2µV
Sensitivity	
50dB S/N (mono)	3µV
50dB S/N (stereo)	21µV
65dB S/N (stereo)	98µV
Ultimate S/N ratio	
mono	79dB
stereo	74dB
Stereo Separation	
20Hz	43dB
1kHz	53dB
15kHz	33dB
Harmonic distortion	
1kHz, 100% mod, stereo	0.15%
19kHz pilot level	-70dB
38kHz subcarrier level	-75dB
Alternate channel selectivity	64dB
Second channel rejection ratio	46dB
10 x IF rejection	75dB
AM rejection ratio	52dB
Maximum output (100% modulation, 1kHz)	640mV
Typical retail price	£200



Distortion with 10kHz signal at 100% modulation



Distortion with 1kHz signal at 100% modulation



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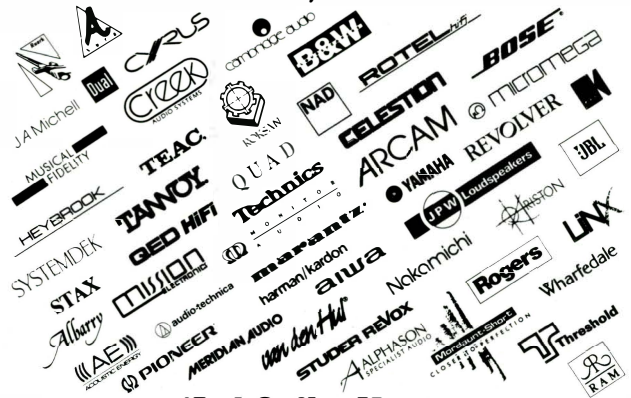
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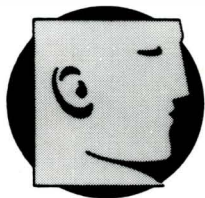
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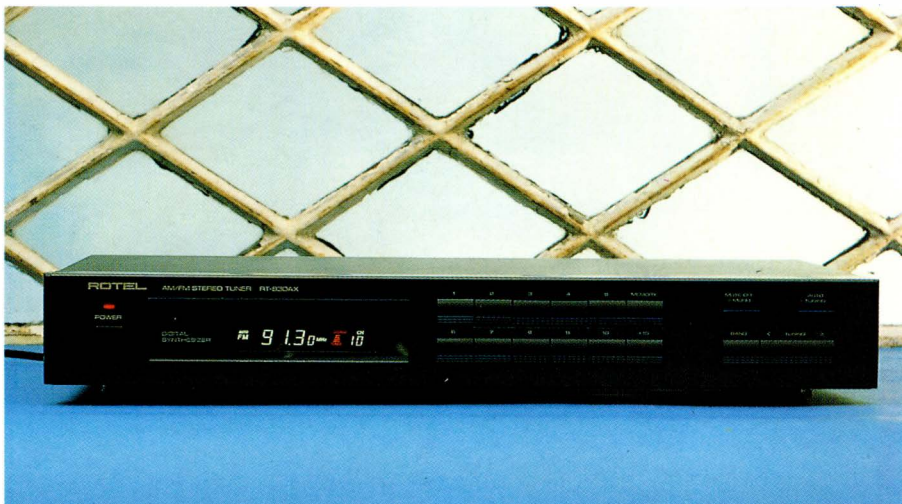
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Rotel RT-930AX

Gamepath, 25 Heathfield, Stacey Bushes, Milton Keynes
MK12 6HR. Tel: (0908) 317 707



Rotel's 800 series has been around so long that it seemed a rare fixture in a changing market, but at last the line has been superseded by the new 900 series of separates, of which the RT-930AX is the cheapest tuner. The overall look is still quite distinctly Rotel, and I find it quite agreeably sleek and smart, only let down by the rather cheesy rocker switch for tuning.

Inside the case is what looks like an astonishing amount of tuner for the money, although the circuits are really quite simple. The RF front end is built on to the main circuit board, with familiar ICs from Toshiba and Sanyo used for the various decoding functions. There are a few 'audiophile' components, in the shape of 'Black Gate' capacitors; I'm sure that these are bound to make all the difference . . .

All three bands are covered by the 930, with 20 presets provided. There is a little emblem which looks as if it might be a signal strength meter but is actually a simple 'tuned' indicator. Add auto scan tuning, and that's your lot for features.

Lab report

Lab test results do not instantly show any obvious measured flaws to tie in with the RT-930's sound; in fact, confusingly, it measured rather well overall.

Its frequency response is far enough from dead flat to have a small audible effect, but I don't believe that this is the whole story. Not only is distortion low in level, it is quite harmless in nature, being mostly low harmonics. I tried a few distortion checks at other frequencies and lower levels without coming up with any profound insights; perhaps the tests simply aren't sensitive enough, compared with the human ear; it wouldn't be the first time, I fear.

Sound quality

The listeners on our panel, who of course were unaware that this was the cheapest

tuner in the batch, were distinctly underawed by the RT-930AX.

'A bit inoffensive — in the worst sense', was one rather hurtful criticism, expanded by indicating its compressed sound, scratchiness on violins, lack of treble expression and subdued bass.

However, speech was reproduced quite naturally, a definite plus point, and the excitement of the jazz track was well conveyed; a bit of scratch and a lack of subtlety were not so important here. Solo piano sounded rather jumbled and mushy, lacking definition and clarity.

Listening to real broadcasts cast this Rotel in a kinder light, although there was still a small degree of treble coarseness on programme with strong high frequency content; again, less noticeable in music such as upbeat jazz and rock.

More worrying is the RT-930's tendency towards 'inoffensiveness', which can have the effect of making the music seem remote from the listener.

I kept feeling that my mind was wandering off the music, but any degree of concentration was of no help in recovering detail, especially imaging information, which the tuner effectively blurred.

However, that comment is perhaps a little harsh in the context of £150, and if one is not trying to listen for the Nth degree of detail, the RT-930 is actually a very competent performer, with low levels of interference and anything that could be described as obvious distortion. Its AM sound is muffled and bass-heavy, though it is also fairly clean.

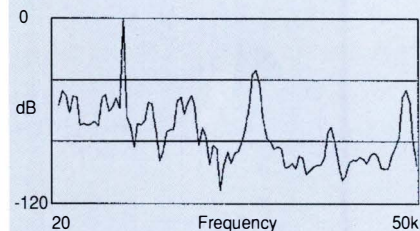
Conclusion

As I mentioned above, the valid criticisms made of the RT-930 must be tempered by a realistic expectation of what one can actually get in a £150 model, and this Rotel is quite sufficiently competent for a formal Choice Recommendation.

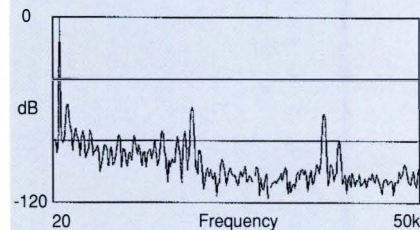


TEST RESULTS

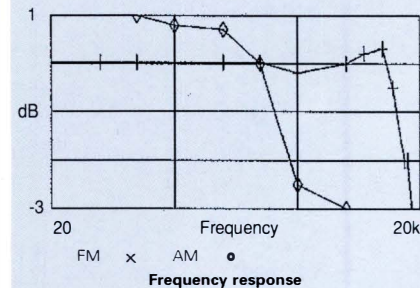
Muting threshold	9µV
Sensitivity	
50dB S/N (mono)	2.5µV
50dB S/N (stereo)	29µV
65dB S/N (stereo)	150µV
Ultimate S/N ratio	
mono	74dB
stereo	71dB
Stereo Separation	
20Hz	42dB
1kHz	47dB
15kHz	31dB
Harmonic distortion	
1kHz, 100% mod., stereo	0.2%
19kHz pilot level	-57dB
38kHz subcarrier level	-75dB
Alternate channel selectivity	>60dB
Second channel rejection ratio	62dB
10 x IF rejection	>60dB
AM rejection ratio	46dB
Maximum output (100% modulation, 1kHz)	720mV
Typical retail price	£150



Distortion with 10kHz signal at 100% modulation



Distortion with 1kHz signal at 100% modulation



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Gold Plated Phonos

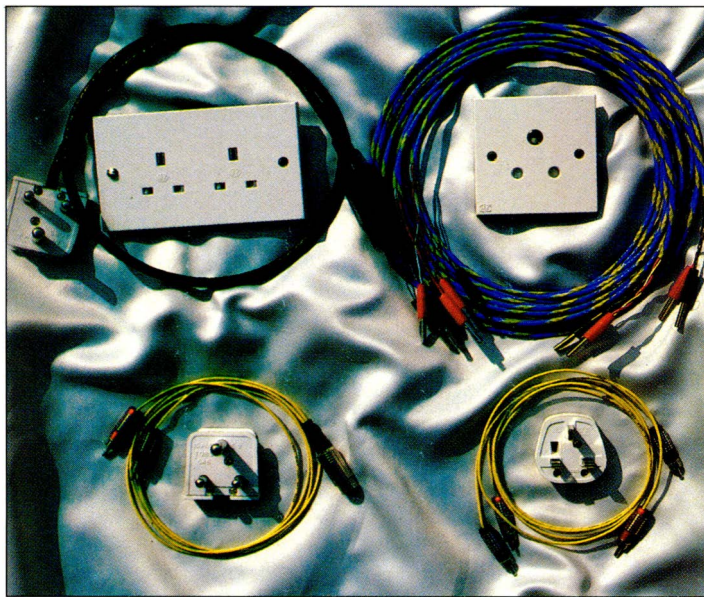
SonicLink BROWN 1/2m	£20.00
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Tech Talk

Each tuner was subject to three distinct phases of testing; auditioning 'blind' by a listening panel, with 'perfect' RF supplied from a CD player via an RF signal generator, auditioning by yours truly and anyone else who happened to be around with a selection of real broadcasts over a period of a couple of weeks, and lab testing of various RF and AF parameters.

The blind tests, a traditional mainstay of *Choice* batch reviews, proved invaluable in assessing the ultimate performance capability of the tuners, that is, how each can sound given a signal from a really good aerial.

The panel listening was not extended to cover real reception, because this would mean subjecting every tuner to a completely different selection of music, different reception conditions (which change through-

Still tuned in? Richard Black explains the way the tests were performed and what the results mean.

out the day) and even different amounts of signal compression applied by the radio stations (for instance, Radio 3 compresses much more heavily around 5-6pm than after 8pm, to cater for listeners driving home). However, we did listen to a brief burst of speech on Radio 4 or LBC on each model.

The tracks used for the blind tests were Bach's *A minor violin concerto* played by the Polish CO on Linn; Victoria's *Tenebrae Responsories* sung by the Tallis Scholars under Peter Phillips, on Gimell; Busoni's *Tocatta* played by John Ogdon, on Continuum; and *Two Bass Hit* from a live Miles Davis/John Coltrane album on CBS.

Ancillary equipment included a Marantz CD273 CD player (plus a few audiophile modifications), Sound Technology 1000A FM generator (plus quite a few ditto), John Shearne *Phase 1* preamp, EAR 549 power amps and ATC SCM20 speakers. I also used for part of the time an interesting EAR prototype non-switching stereo encoder, which gave some idea of where broadcast studios (which tend to use Sound Tech-style switching encoders) could improve things.

Thanks to the listening panel; Terry Murphy (Yamaha), Roger Batchelor (Hayden Labs), John Shearne (Shearne Audio) and Tim Kipling (freelance flautist).

Of the tests performed on each tuner, probably the least important for the listener interested in hi-fi reception are those to do with sensitivity. For a start, most modern tuners come pretty close on that count, due frequently to shared RF stages and decoding ICs, and the figures only indicate how well the tuners pick up distant stations in what is basically mono or even only speech-quality sound.

Take it as read that for respectable stereo sound you will need at least 300µV, for good stereo around 1mV. Most tuners improve audibly above that, and I like to see around 3mV coming from the aerial. Since

only a very few tuners have a meaningful signal strength meter, your ears will be the best judge of signal strength.

Ultimate signal-to-noise ratio is again pretty close between models, and differences of a couple of dB are not of much concern in practice. You may notice that I haven't mentioned subjective noise once in the reviews; that's because not one listener commented on any noticeable differences between models during the listening tests. Such differences as exist are slight and usually submerged in transmitted hiss from the studio.

Channel separation, measured at three frequencies, refers to full modulation of one channel breaking through to the other. 40dB is a good figure in the midband, 30dB plenty adequate in the treble. This sometimes improves a little at lower modulation levels, and so the figures given are worst case.

Harmonic distortion is quoted for in-band harmonics of a 1kHz signal applied to both channels, in phase, at 100 per cent modulation. The 1kHz distortion graph shows detail of the same measurement, while the 10kHz distortion graph shows up clearly the intermodulation products caused by the stereo decoding circuitry in the tuner. Since all the tuners use basically the same methods of stereo decoding, it is not surprising that the graphs show a certain family resemblance, but look out particularly for signals below the 19kHz pilot tone, which represent audible intermodulation.

Ultrasonic tones may cause distress in a following amplifier or loudspeaker, but are not in themselves directly audible.

Pilot and subcarrier breakthrough are quoted as levels relative to full output, in the absence of any audio signal; obviously, the lower (more negative) the figure, the better.

The remaining tests refer to the tuners' ability to reject interference from other radio signals. Alternate channel selectivity is a measure of immunity to a channel 400kHz away from the wanted station, second channel rejection is the same test applied to an interfering signal twice the IF (21.4MHz) away from the wanted station, and ten times IF rejection tests the tuner's response to signals at the tenth harmonic of the IF, 107MHz.

As long as these figures are all in the region of 50dB or above, audible interference is most unlikely in real situations, while figures below 30dB for any of them indicate a real design problem. AM rejection is a measure of immunity to amplitude modulation of the wanted signal, such as may occur due to interference from other electronic appliances, for instance. A figure of 40dB is adequate here, especially since most received interference in tuners usually creeps in via the screen of the aerial cable or even the audio leads and is demodulated by parasitic mechanisms in the RF and IF stages.

Finally, since the output of all the tuners tested here is in the region of 1V, they are all going to be perfectly compatible with any integrated amplifier I have ever encountered, any active preamp, and a few passive preamps (depending on the power amp that follows).

Choice Offers

Our Mail Order Section this month features, among the old favourites such as Furakawa interconnects, some great new accessories to help improve the performance of your system. We've been reviewing some new and interesting products and have selected some that we thought you should know about.

Goldring Magic Record Cleaner

This is a kit consisting of a double sided velvet brush and spray on Goldring Magic record rejuvenating fluid.

Unlike some other record cleaning potions this one makes old grubby records sound smoother and less gritty, reducing surface noise quite significantly. For best results use with the Mk10 brush.

£11.95 ref: A13

The Purifier

The Purifier is a ferrite cable clamp designed to reduce RF induced noise in audio, video and computer systems.

The clamps will accept single or multiple cables of up to half an inch in diameter and can be used on both signal and mains cables. The main benefit is a general cleansing of a system's sound allowing finer resolution of low level detail.

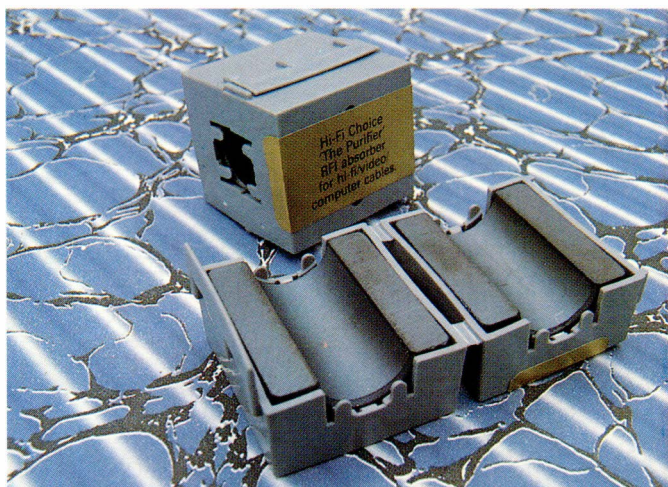
They can be particularly beneficial for digital interconnections.

£16.90 per pair ref: A14

Nagaoka Anti-Static Record Sleeves no.102

Packs of 50 plastic record sleeves that can be used on their own or inserted into an existing card or paper sleeve.

The sleeves keep records dust free and eliminate static, but



are of course hampered if the record isn't cleaned before it's stored. No great sound quality claims but in these days of disappearing vinyl it pays to take care of what you've got, after all there may never be a format to beat it!

£6.99 ref: A15

Mk 10 Carbon Fibre Brush with Velvet Pad

The carbon fibres efficiently remove dirt from the record grooves, which is then collected by an integral felt pad. This can be easily cleaned with the supplied tool after use.

£9.99 ref: A8

System Cleaning Kit 1

Everything needed for maintaining a hi-fi system, all contained in one handsome wallet pack. Stylus cleaner, auto reverse wet tape head cleaner and cleaning fluid, manual CD cleaner and cleaning fluid and a carbon fibre record cleaning brush.

£15.99 ref: A9

Milty Work Mat

The Milty Work Mat is a large rubber mat that has been designed to support records, Laser Discs and CDs when they are being cleaned.

It is covered in 1mm long tentacles which gently grip the

disc so that it can be cleaned without moving about or rotating.

The nature of the material ensures that no static is induced and dirt falls between the tentacles. It's a real boon to disc cleaning and makes using cleaning brushes and solutions completely painless.

£7.99 ref: A16

Kontak cleaning solution

Kontak is a two stage contact cleaner for all audio and mains connections. All connections are susceptible to oxidation and contamination which impairs electron flow and thus affects sound quality.

Here's what Paul Messenger had to say when he tried some on his system; "The effect on the power amps alone was so astonishing I had to carry on and cover the whole system. By the time I was finished the system was utterly transformed. Timing and coherence were back with a vengeance; surface noise and coloration were both much less audible and the soundstage had liberated itself from the boxes"

£19.90 ref: A17

Newnes Audio and Hi-fi Engineer's pocket book (second edition)

This useful little book covers a wide range of audio topics with concise explanations to clarify the information.

It covers everything from turntables and cartridges to DCC and DAT with as much technical information as the mere mortal could wish for.

If you really want to know what makes your CD player tick and aren't afraid of the odd wiring diagram or equation this is the book for you.

£10.95 ref: A18

The Art of Digital Audio - John Watkinson (revised reprint)

This book describes all of the essential theory of digital audio, and a good deal of practice, but it is not a history book. Nor is it a conventional textbook, largely because such things have to choose a target audience and stick to that academic level.

The need for understanding in digital audio is too wide and the subject is too interdisciplinary for that. As you can imagine this is a

Improve the sound of your system for a mere £15

Ever wondered why some people get taken seriously in hi-fi shops while others are given the run around? Wonder no more. The answer to all your hi-fi problems is the *Hi-Fi Choice* sweatshirt. Tastefully printed in red and black on grey, as well as being this year's most crucial fashion accessory, it will also readily identify you as a reader of Britain's fastest growing hi-fi magazine. You'll almost certainly be taken more seriously and end up with a better system – and all for a mere £15. We can supply the shirts in two different sizes – Large and Extra Large.



MAIL ORDER

comprehensive tome that covers all aspects of digital technology including disc drives, rotary and stationary head recorders and even interconnects. It is a must for anyone wanting to get fully acquainted with the subject.

£49.50 ref: **A19**

Technics Auto Compact Disc Cleaner

The Technics *RP-CL300* is a powered wet/dry CD cleaner that can be run off batteries or the mains.

It works by rotating the disc and applying the wet cleaner first (cleaning solution is supplied), then reversing the direction of rotation and dry cleaning the disc. The whole process takes just 40 seconds and a set of batteries should clean 80 discs.

£39.95 ref: **A20**

Audio Technica CD lens cleaner AT-6078

The focussing assembly for the laser head of a CD player is a very delicate affair and yet it requires cleaning from time to time.

Rather than fumbling about with cotton buds we would suggest you employ an Audio Technica CD lens cleaner. This is a standard size disc with a set of eight tiny brushes set into it, to use just apply a drop of cleaning fluid on one of the brushes, place the disc in your player and press play.

Ten seconds later, hey presto, a clean laser assembly, and cleaner sound from your CDs as a result.

£16.95 ref: **A21**

Speaker Cables

Furukawa *FS-2T14* PCOCC speaker cable

FS-2T14 PCOCC speaker cable is Furukawa's entry level speaker cable consisting of two 1.4mm square drawn PCOCC concentric strands.

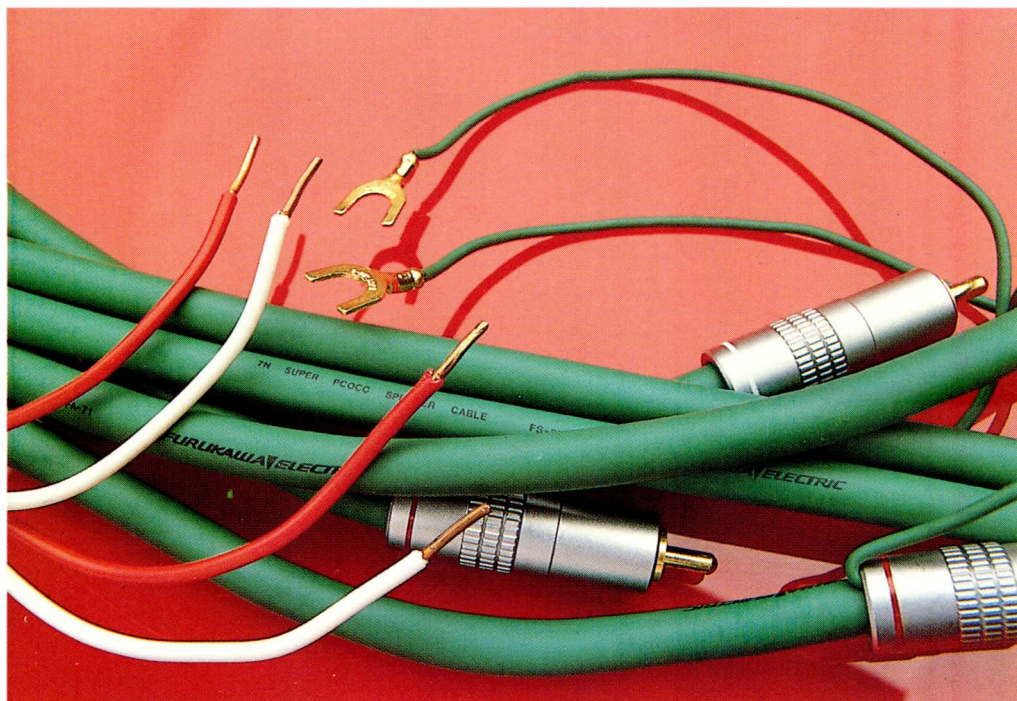
Furukawa *FS-2F09* PCOCC speaker cable

Two 0.09mm square drawn PCOCC strands are contained in a neat, flat, flexible PVC insulation.

The *FS-2F09* is highly regarded by audiophiles around the world.

Furukawa *FS-2T30F* Evencap speaker cable

PCOCC speaker cable consisting of two 3mm square drawn PCOCC rope lay strands. *FS-2T30F* speaker cable, by virtue of its low resistance and



3mm section, increases the audible bandwidth, most particularly in the low frequencies.

FS-2T20P PCOCC speaker cable

PCOCC cable consisting of two twisted 2mm² drawn PCOCC strands laid in a concentric pattern.

The two conductors are insulated in polypropylene and contained in a circular outer sleeve of soft PVC.

Furukawa *FS-2T35P* PCOCC speaker cable

Produced from six concentric laid conductors in a rope lay this large cable has a low DC resistance and a larger occupation area for the skin effect, therefore bass is larger and treble is even sweeter.

Furukawa *FS2T55F* Evencap speaker cable

FS-2T55F is a 5.5mm 2 rope lay cable of similar construction to the *FS2T30F*.

Interconnects

We have a variety of interconnects on offer, all sourced from the respected Japanese specialist Furukawa.

The *FA21 Series* balanced analogue interconnect cables

The *FA21 Series* of analogue interconnects is supplied in matched pairs employing the Furukawa all PCOCC RCA plug with a flying earth or ground lead.

These interconnect cables are recommended for the connection of analogue devices where RCA sockets are provided. They can introduce a wide stereo image with good depth and height.

Furukawa *FD-11 Series* balanced digital coaxial interconnects

These 75ohm interconnects consist of a PC-OCC central conductor, double insulated with high density and air foamed polyethylene for high mechanical isolation. They are recommended for the interface between CD transports and DACs.

Furukawa *FA11S Series* balanced analogue interconnect cables

This interconnects is supplied in matched pairs employing the Furukawa hermetically sealed all PCOCC RCA phono plug with a flying earth or ground lead.

The cable's ability to transmit a vast amount of information has the effect of creating an awe inspiring bass, transparent mid range and simply superb unfettered treble.



Audiophile Recordings

We are pleased to be able to offer a selection of records from the world famous Reference label. Guaranteed to get the very best from your system these recordings have been selected for the merits of the performance as well as their outstanding sound quality.

Prof Johnson's Astounding Sound Show: Sampler.

Orchestral Fanfare - Red Norvo Quintet - Cal Arts Ensemble - Richard Morris - Organ - Susan Mc Donald, Harp - Kronos Quartet - David Rosenthal, Tubulung.

A perennial audiophile favourite, this sampler of Prof Johnson's early work shows what Reference can do with a wide variety of musical and sonic experiences.

Includes the only known recording of an unusual tuned mallet instrument, the Tubulung. Guaranteed to give your playback system a royal wringing out!

Copland: *Appalachian Spring Suite, Eight poems by Emily Dickinson.* Keith Clark/Pacific Symphony Orchestra, Marni Nixon, Soprano (in the poems).

Music by America's best loved composer, *The Appalachian Spring Suite* is presented in its original version for 13 instruments. Also included is the world premiere recording of Copland's orchestration of eight of his Emily Dickinson songs.

This recording was a Grammy Award nominee in 1987. The CD version also contains *An Outdoor Overture*.

Walker & Garson: *Reflections. Portrait of a friend - Love - First song - Ethereal - Yearnings - Pied piper - The park - Magic spell - You're one of a kind - Reflections - Reason.*

Jim Walker on flute and Mike Garson on piano from the jazz group 'Free Flight' offer something peaceful and soothing for those quiet moments. Surprisingly natural sound.

Helicon Ensemble: *Vivaldi/Bach Vivaldi: Sinfonia in C-Trio Sonata in G minor - Double Concerto in E-Flat. Bach: Trio Sonata in C - Double Concerto in D minor.* (Compact Disc also contains *Prelude in C*)

Albert Fuller conducts from the harpsichord a varied original instrument ensemble in works featuring two solo violins, including the great *Double Concerto* by Bach and three rare, ingratiating works by Vivaldi. Featured solo artists are Japp



Schroeder, Stanley Richie and Linda Quan.

Recorded at the John Harnes Centre for the Performing Arts in Englewood, New Jersey. CD also has Bach's *Prelude in C*.

Walton: *Facade Suite.*
Walton: *Facade Suite - Strauss/Hasnohl: Till Eulenspiegel - Scriabin/Elliott: Waltz in A-Flat - Nielsen: Serenata in Vano.* Chicago Pro Musica.

An instrumental from Walton's whimsical *Facade* in the composer's original scoring makes a perfect vehicle for these brilliant musicians. A chamber version of *Till Eulenspiegel* and the seldom heard pieces of Scriabin and Nielsen complete this engaging programme.

Tafel Music: *Popular Masterworks of the Baroque*
Pachelbel: *Canon & Gigue.*
Handel: *suite from 'Water Music'* **Purcell:** *air from Suite no. 3 in D and Suite from 'The Moor's Revenge'.* **Vivaldi:** *Concerto op. 10-2, 'La Notte'.*

Canada's finest original-instrument Baroque ensemble plays familiar favourites with outstanding scholarship and musical panache. Note the Pachelbel *Canon* with its seldom heard companion piece, both to the composer's instrumentation. Strings, oboes, recorder and harpsichord offer delightful music recorded in a vaulted ceiling stone church.

Stravinsky: *L'Histoire.*
Stravinsky: *L'Histoire du soldat suite.* **Blackwood:** *Capriccio Espagnol.* Chicago Pro Musica.

Stravinsky's landmark composition for a mixed ensemble of seven. Grammy winning performances.

Respighi: *Church Windows.* Keith Clark, Pacific Symphony Orchestra.

This grandiose work, scored for full symphony orchestra, pipe organ and tam-tam, has at last been given its due, musically and sonically, in this celebrated recording. *Church Windows* quite literally pushes to the theoretical limit the dynamic range it is possible to reproduce at home.

The CD also contains Respighi's rare mini concerto *Poema Autunnale* with the violinist Ruggiero Ricci.

Marni Nixon: *Marni Nixon sings Gershwin. Summertime - Let's call the whole thing off - Someone to watch over me - I've got a crush on you - But not for me - The real American folk song - Nice work if you can get it - Embraceable you.*

Marni Nixon's impeccable intonation and diction bring a welcome elegance to these songs which are perhaps too often jazzed up. By beautifully singing what Gershwin wrote, stylishly accompanied by Lincoln Mayorga's piano, Miss Nixon brings new insights to these immortal songs.

Eileen Farrell: *Torch Songs. Stormy weather - Round Midnight - The end of a love affair - Black coffee - When your lover has gone - Don't explain - Something Cool - and more.*



The album Farrell fans have been waiting for. America's great blues diva makes these songs of lost love her own.

Smoky night club arrangements set the stage for some unforgettable singing.

Dick Hyam: *Dick Hyam Plays Fats Waller. Ain't misbehavin' - Keepin' out of mischief now - African ripples - Honeysuckle rose - Willow tree - Stealin' apples - I've got a feeling I'm falling - Handful of keys - My fate is in your hands - Jitterbug waltz - Squeeze me.*

The world's first direct-to-CD on RR-33DCD. A technological and musical triumph, a true landmark in recording history. RR-33DCD (listed as Ref CD87 on the order form) is available as a deluxe numbered limited edition.

Encoded on the highly sophisticated, computerised Boesendorfer reproducing piano, Hyman's performances were played back for Prof Johnson's microphones, and the digitised signal was transmitted via microwave to the compact disc master as the music was being played.

No recording tape of any kind was used, nor was the digital bitstream corrupted at any stage by copying manipulation or editing.

The digits generated at the recording session are the very digits on the finished Compact Disc. Also on ordinary CD and LP.

Michael Garson: *Serendipity. Lady - Autumn leaves - I should care - Spirit of play - Trio blues -*

My romance

With illustrious sidemen Stanley Clarke (bass). Gary Herbig (sax), Peter Sparague (guitar) and fellow Free Flight members Jim Walker and Jim Lacefield, Michael Garson has put together a tasty program of exciting mainstream acoustic jazz. Recorded by Prof Johnson in a real concert space, *Serendipity* represents an alternative, non-studio approach to jazz recording. A long standing favourite for audio demo, the CD contains two extra tracks.

Star of Wonder:

Silent night - Nativity carol - We three kings - We'll Dress the house - Come all ye faithful - Deck the hall -

Festive music for the holiday season by an outstanding professional chorus, recorded in San Francisco's St Ignatius Church.

The spine tingling acoustics are ideal for this program and *Star of Wonder* contains the full range of Christmas music: imaginative arrangements of traditional carols, renaissance motets and dramatic 20th century compositions.

The CD contains three extra tracks.

Berlioz: *Fantastique. Symphonie Fantastique.* Varujan Kojian, The Utah Symphony Orchestra.

This is widely considered to be the recording of this magical work. The Utah Symphony Orchestra, playing in Salt Lake City's Symphonic Hall, gives a world class performance, and the excellent recording captures it in its entirety

The CD contains two versions of the explosive finale, one with standard orchestral bells, and another with digitally recorded church bells.

The 2-disc 45RPM LP set contains two copies of *March To The Scaffold* and *Dreams Of A Witches Sabbath*.

Nojima: *Nojima plays Liszt. Sonata in B minor - Mephisto Waltz - La Campanella - Harmonies du Soir - Feux Follets.*

The recipient of more rave reviews than any piano recording in recent memory, this is truly one for the history books.

Japan's most celebrated concert pianist won the Silver Medal at the Van Cliburn competition. Connoisseurs of great piano playing will treasure this recording, which has also been acclaimed for its outstanding sonic realism

Chicago Pro Musica: *Weill, Varese, Bowles and Martinu. Threepenny Opera suite - Octandre - Music for a farce - La Revue de Cuisine.*

Chicago Pro Musica gives brilliant performances of four magnificent 20th Century works. Kurt Weill's pungent suite for wind, brass and percussion is the centrepiece.

Featuring the first stereo recording of a rare piece by Paul Bowles, best known as the author of *The Sheltering Sky* but also a distinguished composer for the stage.

Martinu's Parisian ballet from the 1920s contains the steamiest of tangos and a mad Charleston.

Eileen Farrell: *Rogers & Hart. I could write a book - I wish I were in love again - Wait till I see him - I didn't know what time it was - Love me tonight - Nobody's heart - It never entered my mind - Mountain greenery - Sing for your supper - Can't you do a friend a favour - Lover - My heart stood still - Little girl blue - You're nearer.*

A wide ranging survey including many great standards and more than a few rarities. Farrell's affinity for the songs of this era is undisputed.

Beautifully sung as her earlier pop recordings were, these new performances reveal an added dimension to the Farrell art - total involvement with the lyrics. And what lyrics! A must for admirers of Lorenz Hart.

Nojima: *Nojima Plays Ravel. Miroirs: Noctuelles - Oiseaux tristes - Une baroque sur l'océan - Alborada del gracioso - La valse des cloches - Gaspard de la Nuit: Odine - Le gibet - Scarbo.*

Here is the eagerly awaited sequel to Nojima's first American recording, featuring some of his most renowned specialties.

Gaspard de la Nuit is the pianist's Everest, attempted by only a few. *The Miroirs* are a distillation of Ravel's impressionist style, requiring a totally different technique. The Nojima performances are incandescent.

Opus 3 test record 1: Depth of image.

Produced with the idea of analysing hi-fi systems and their ability to reproduce depth of image. This is Opus 3's best selling recording. It contains the work of a broad cross section of the label's recording artists.

Opus 3 test record 2: Timbre.

Timbre or tonal accuracy is a crucial area of performance for audio equipment, this disc is composed of tracks designed to show up the timbral strengths of the components its played through. A good recording of interesting and diverse music.

Opus 3 test record 3: Dynamics.

Another compilation on the Swedish Opus 3 label, with musical extracts carefully chosen

to illustrate what is meant by musical dynamics with comprehensive liner notes to show you what you should be listening for. How good is your hi-fi system?

Opus 3 test record 4: Depth of image, Timbre, Dynamics.

In this fourth recording in the test series Opus has linked together the three concepts as a basis for completely evaluating audio equipment. Test record 4 like the first three contains a selection of illustrated music from our catalogue - mostly from the more recent recordings.

Thelma Houston & Pressure Cooker: *I've got the music in me.*

I've got the music in me - To know you is to love you - Don't misunderstand - Got to get you into my life - plus four instrumental tracks.

One of Sheffield Labs' most famous recordings. The original direct cut has been out of print for many years and is now highly collectable - but the recording sessions were of course taped, and this issue will still blow your socks off!

Eileen Farrell: *Sings Arlen. Let's fall in love - Out of this world - I wonder what became of me - I've got the world on a string - Like a straw in the wind - Down with love - Happiness is a thing called Joe - A woman's prerogative - Come rain or come shine - Little drops of rain - Over the rainbow - When the sun comes out - As long as I live - My shining hour - Last night when we were young.*

Farrell worked often with Harold Arlen, and has long been identified with his music: it was an Arlen tune that gave the title to the first of four albums of pop songs she made in the sixties, *I've got a right to sing the blues*.

This definitive new collection is graced with music notes and personal remembrances by Gene Lees.

Jim Brock: *Tropic affair Pass a grill - Ladies of the Clabash - Tropic affair - Anya - Quo qui's groove - Side walk - Palm palm girls - O vazio.*

Vibrant, steamy and sensual, this contemporary instrumental jazz contains more than a touch of the tropics.

Renowned percussionist Jim Brock has recorded and toured with such diverse musical talents as Dave Valentin, Janis Ian and Scott Cossu.

Brock's dynamic ten-piece band, production by legendary Don Dixon, and prof. Johnson's magical live to two-track studio sonics result in a soundstage of such three-dimensionality, you can step inside the music. Enjoy

a vacation without leaving home with tropic affair!

Eileen Farrell: *Sings Johnny Mercer Skylark - I remember you - Early Autumn - Laura - I thought about you - Too marvelous for words - and more.*

Arranged by Manny Albam and Loonis McGlohan, this album includes rarities and favourites from the vast catalogue of America's most poetic and prolific lyricist.

Eileen Farrell: *It's over I get the blues when it rains - How about me? - Easy to remember - Gone with the wind - I remember April - And more memorable tear jerkers.*

Arranged and conducted by Robert Farnon, this album gives Farrell the opportunity to demonstrate her considerable skills, in touching songs of lost love. These great laments respond eloquently to the lush Farnon treatment.

NEW RELEASES

Robert Farnon conducts the Royal Philharmonic Orchestra: Film music and other works *Suite from Captain Horatio Hornblower - Lake in the woods - Canadian impressions - A la Claire fontaine - and more.*

The Royal Philharmonic Orchestra, conducted by the composer, Robert Farnon at the Town hall, Watford.

The recording session that *Hi-Fi Choice* contributor Richard Black wrote about in the February issue (103), produced by the legendary Prof Keith Johnson using both analogue and digital tape recorders to produce the finest results for LP and CD.

This has the traditional Reference Recordings virtues of wide bandwidth and dynamic range and an unusual degree of clarity, due in no small part to the simplicity of the recording equipment.

Malcolm Arnold: *Conducts the London Philharmonic Orchestra. A Sussex overture - Bechus - Dandi Pratt - The smoke - Anniversary overture - The fair field - Flourish for orchestra - The Commonwealth Christmas overture.*

On this very latest Reference recording the London Philharmonic Orchestra is conducted by the composer, Malcolm Arnold, at the Town hall, Watford.

This Keith Johnson production includes first recordings of Britain's leading living composer's lesser known works.

Record and CD PriceTable

Prof Johnson's Sound Show:

Ref RR-7 (LP only) (£18.50)

Berlioz: *Fantastique*

Ref RR-11 (double) (£24.99)

Ref RR-11CD (£18.50)

Tafel Musik: *Baroque*

Ref RR-13 (£18.50)

Ref RR-13CD (£18.50)

Respighi: *Church Windows*

Ref RR-15 (£18.50)

Ref RR-15CD (£18.50)

Stravinsky: *L'Histoire*

Ref RR-17 (£18.50)

Ref RR-17CD (£18.50)

Copland: *Apalacian Spring*

Ref RR-22 (£18.50)

Ref RR-22CD (£18.50)

Helicon Ensemble: *Vivaldi*

Ref RR-23 (£18.50)

Ref RR-23CD (£18.50)

Nojima Plays Liszt:

Ref RR-25 (£18.50)

Ref RR-25CD (£18.50)

Nojima Plays Ravel:

Ref RR-35 (£18.50)

Ref RR-35CD (£18.50)

Mike Garson: *Serendipity*

Ref RR-20 (£18.50)

Ref RR-20CD (£18.50)

Walker & Garson: *Reflections*

Ref RR-18 (LP only) (£18.50)

Marni Nixon: *Marni sings...*

Ref RR-19 (£18.50)

Ref RR-19CD (£18.50)

Star of wonder:

Ref RR-21 (£18.50)

Ref RR-21CD (£18.50)

Chicago Pro Musica: *Weill*

Ref RR-29 (£18.50)

Ref RR-29CD (£18.50)

Eileen Farrell: *Torch Songs*

Ref RR-34CD (£18.50)

Dick Hyams Plays Fats Waller:

Ref RR-33 (£18.50)

Ref RR-33CD (£18.50)

Ref RR-33DCC (£29.99)

Opus 3 test record 1

Ref OP-7900CD (£17.99)

Ref OP-7900LP (£17.99)

Opus 3 test record 2

Ref OP-8000LP (LP only) (£17.99)

Opus 3 test record 3

Ref OP-8300CD (£17.99)

Ref OP-8300LP (£17.99)

Opus 3 test record 4

Ref OP-9200CD (£18.50)

Ref OP-9200LP (£18.50)

Thelma Houston: *Music in me*

Ref CD-2 (£18.50)

Eileen Farrell: *Sings Arlen*

Ref RR-30 (£18.50)

Ref RR-30CD (£18.50)

Jim Brock: *Tropic Affair*

Ref RR-31 (£18.50)

Ref RR-31CD (£18.50)

Eileen Farrell: *Sings Johnny Mercer*

Ref RR-44CD (£18.50)

Eileen Farrell: *It's Over*

Ref RR-46CD (£18.50)

Malcolm Arnold/RPO:

Ref RR-48 (£18.50)

Ref RR-48CD (£18.50)

Robert Farnon/RPO

Ref RR-47 (£18.50)

Ref RR-47CD (£18.50)

Choice Offers Order Form

Accessories

Please indicate which items you require by ticking the appropriate box.

<input type="checkbox"/> A8	Mk 10 Carbon Fibre Brush with Velvet Pad	£9.99
<input type="checkbox"/> A9	System Hi-Fi Cleaning Kit 1	£8.00
<input type="checkbox"/> A13	Goldring Magic Record Cleaner	£11.95
<input type="checkbox"/> A14	The Purifier	£16.90
<input type="checkbox"/> A15	Anti-Static Record Sleeves	£6.99
<input type="checkbox"/> A16	Milty Work Mat	£7.99
<input type="checkbox"/> A17	Kontak Cleaning Solution	£19.90
<input type="checkbox"/> A18	Newnes Audio and Hi-fi Engineer's pocket book	£10.95
<input type="checkbox"/> A19	The Art of Digital Audio	£49.50
<input type="checkbox"/> A20	Technics Auto CD cleaner	£39.95
<input type="checkbox"/> A21	Audio Technica CD lens cleaner	£16.95

Furukawa Price Table

Please circle the cables you require.

Interconnects - RCA to RCA

Fibre optics - TOSLINK

	0.5m	1.0m	1.5m	2.0m		1.0m	1.5m
FV11 (each)	50.00	55.00	57.50	60.00	FO11 (each)	45.00	50.00
FD11 (pair)	85.00	92.50	97.50	NA	FO12 (each)	110.00	120.00
FA21 (pair)	NA	105.00	110.00	NA	FO13 (each)	130.00	140.00
FA11S (pair)	NA	250.00	NA	NA			

Speaker cables

Please state termination required, solderless, gold plated banana plugs, spades or pins or any combination. All prices are per pair.

	FS2T14	FS2FO9	FS2T20P	FS2T30F	FS2T35P	FS2T55F	FS2T15S
2.0m	52.00	48.00	65.00	85.00	95.00	139.00	229.00
2.5m	57.75	52.75	74.00	99.00	111.50	166.50	279.00
3.0m	63.50	57.50	83.00	113.00	128.00	194.00	329.00
3.5m	69.25	62.25	92.00	127.00	144.50	221.50	379.00
4.0m	75.00	67.00	101.00	141.00	161.00	249.00	429.00
4.5m	80.75	71.75	110.00	155.00	177.50	276.50	479.00
5.0m	86.50	76.50	119.00	169.00	194.00	304.00	529.00

Extra lengths are available at the following additional cost per metre

11.50	9.50	18.00	28.00	33.00	55.00	100.00
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Yes! Please send me Hi-Fi Choice sweatshirts at a mere £14.99 each.
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Dealer Guide

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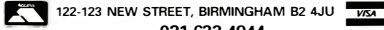


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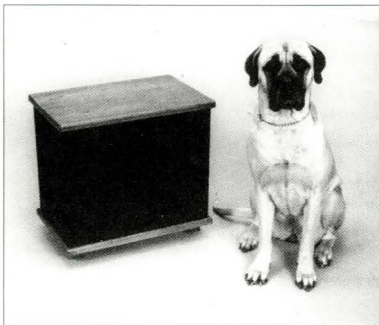
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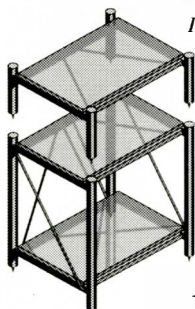
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SIGHT N SOUND, The Treaty Centre, Hounslow, Middlesex TW3 1ES. 081 572 5418, fax 081 572 5417. Sony, Kenwood, Finlux, Toshiba, Philips, Sanyo, Grundig, Pioneer, Technics, Akai. No appts nec, free intall, service dept. Access & Visa, financing available. 9-6pm Mon-Sat.

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PJ HI-FI - the Hi-Fi Shop, 3 Bridge Street, Guildford, Surrey GU14 9YR. Tel: (0483) 504801. 9-6 Mon-Sat. Linn, Meridian, Creek, Arcam, Quad, Revox, Musical Fidelity, Rotel, NAD, Nakamichi, Marantz.

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RIVERSIDE HI-FI, 422 Richmond Road, East Twickenham, TW1 2EB. Tel: (081) 892 7613. Fax: (081) 892 7749. See main entry under Middlesex

ROGERS HI-FI, 13 Bridge Street, Guildford, Surrey. (0483) 61049. Aiwa, Denon, Dual, JPW, Marantz, Monitor Audio, Philips, Pioneer, Systemdek, Tannoy. Demonstration facilities available, no appointment necessary. Free installation. Service department. Access/Visa. Instant credit up to £,000 subject to status. Monday-Saturday 9.30-6pm, later by appointment

SOUNDS EXCLUSIVE, 1 Kent House, High Str, Cranleigh GU6 8AU. (0483) 268185. Michell (amplification & decks), Marantz, Ariston, Ortofon, AME, Sumo, Proac, Jamo, Origin Live, Kiseki. Demo room, appts preferred, home trial facilities, free install, service dept. Access, Visa. Open 9-5.30 Mon-Sat.

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TRU-FI SOUND AND VISION, 2 Central Parade, Redhill, Surrey. (0737) 767404/766128. Aiwa, Audio Technica, B&W, Nakamichi, Mission, Mordaunt-Short, Nakoaka, Sony, Technics. Dem. facilities. Free

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UNILET HI-FI, 35 High Street, New Malden, Surrey KT3 4BY. (081) 942 9567. Kef, Mission, Musical Fidelity, NAD, Nakomichi, Quad, Rotel, Tannoy. Demos. Amex, Access, Visa, etc.

ZEBRA 18-24 Brighton Road, South Croydon CR2 6AA. 081 688 2093. See main entry under London.

SUSSEX (EAST)

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BOWERS & WILKINS LTD, 1 Becket Buildings, Little Hampton Rd, Worthing. (0903) 64141. B&W, Nakamichi, Castle, Denon, Dual, JVC, Mordaunt Short, Philips, Quad, Sony, Technics. 3 dem rooms. Mon-Sat 9-5.30, Wed 9-1pm. Home trial facilities, free install. Credit to £1000, Access, Visa. Service dept. *

CHICHESTER HI FI, 7 St. Pancras, Chichester, W. Sussex PO19 1SJ. Tel: (0243) 776402. Linn, Naim, Rega, Creek, Nakomichi, A&R, Denon, Roksan etc. Tues-Sat, 10-1, 2-5.15 (closed Mon)

TYNE & WEAR

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NEWCASTLE HI-FI, 153 Kenton Road, Gosforth, Newcastle-Upon-Tyne NE3 4NQ. (091) 285 7179. Linn, Arcam, Creek, Marantz, JPW, NAD, Denon, Ruark, Custom Design, Aiwa, etc. 2 single speaker demonstration rooms. Installation, delivery, 2 yr guarantee on all products. Access, Visa 10-5.30 Tue-Sat.

WARWICKSHIRE

NAAM HI-FI VISION, 78 Lower Precinct, Coventry CV1 1DX. (0203) 632086. Technics, Pioneer, Kenwood, AR, Akai, Aiwa, Panasonic, Toshiba, Wharfedale, KEF. Demo facilities. Access, Visa, Amex, Lombard Tricity credit charge. 9.00-6.00 Mon-Sat.

WILTSHIRE

AUDIO T, 60 Fleet St, Swindon, Wilts. SN1 1RA. (0793) 538222, Fax (0793) 487260. Great hi-fi from Linn, Denon, Meridian, Mission/Cyrus, Rotel, Sony, Yamaha and many more. Tue-Sat 9.30-5.30. Single spker dem room, free del. and instal.

WORCESTERSHIRE

WEST MIDLANDS AUDIO, 158 Ombersley Road, Worcester WR3 7HA. (0905) 58046. Linn, Naim, Rega, Absolute Sounds, Meridian, Arcam, Ion Systems, Roksan. 3 dem rooms for budget & high end audio. Appointments necessary. Free installation. Service Dept. Access, Visa, Amex, Diners, Lombard/Hitachi. Mon-Fri 9.30-8.30 by appt Sat 9-5.30.

YORKSHIRE (NORTH)

SCARBOROUGH HI-FI CENTRE, 53 Dean Road, Scarborough, N. Yorks YO12 7SN. (0723 374547. Aura, B&W, Mission, Quad, NAD, Oxford, Alphason, Rogers, Nakamichi, Ruark, Voyd. Dem room, appointment preferred. Home trial facilities. Free installation. Service dept. Access/Visa/Credit charge/£1,000 instant credit/Amex/Diners. 10-6 Tues to Sat.

HARROGATE HI-FI CENTRE, 15 Commercial Street, Harrogate, N. Yorks

HG1 1UB. (0423) 504274. Aura, B&W, Mission, Quad, NAD, Oxford, Alphason, Rogers, Nakamichi, Ruark, Voyd. Dem room, appointment preferred. Home trial facilities. Free installation. Service Department. Access/Visa/Credit charge/£1,000 instant credit/Amex/Diners. 10-6 Tuesday to Saturday.

SOUND ORGANISATION YORK, 2b Gillygate, York YO3 7EQ. Tel: (0904) 627108. Linn, Meridian, Micromega, Naim, Rega, Roksan, Arcam, Mission, Denon, Epos, Rotel. 2 single speaker dem rooms. Appts. preferred. Home trial. Free installation. Service dept. Credit facilities on request. Access, Visa. 10am-5.30pm Tues-Sat. Sony dealer Award nominated '86, '87, '88.

VICKERS HI-FI, 24 Gillygate, York. (0904) 629659. Audiolab, Harman-Kardon, Marantz, Musical Fidelity, Pink Triangle, Quad, Systemdek, Tannoy, Technics, & lots more. 3 demonstration studios (2 by appointment) superb showrooms, 2 year guarantee on all hi-fi products. Appts as above, home trial facilities, free installation, service department. Qualified and experienced staff, over 20 years experience 12 months interest free credit. 10.30-5.30 Mon-Sat.

YORKSHIRE (SOUTH)

BARNLEY HI-FI CENTRE, 40-42 Sheffield Road, Barnsley, S. Yorks. S70 1HP. (0226) 205549 Fax (0742) 467207. Arcam, Quad, Audiolab, Mission Cyrus, Technics, Denon, Tannoy, Nakamichi, Dual, Rotel. Purpose built demo room, no appts necessary, free install, service dept. Access, Visa, varying finance packages. Open 9.30-5.30, 5 days (closed Thurs)

HI-FI STUDIO, Sunnyfields, Doncaster. (0302) 781387. Heybrook, Monitor audio, Art Audio, TDL, Michell, Sugden, Acoustic Energy, Alphason, Teac, Dual. Listening room demos. Home trial. Free installation. Licensed credit broker, 2 yr guarantee on all equipment. Service available. Access, Visa. 10-8pm 6 days. Phone for further info & FREE fact pack.

YORKSHIRE (WEST)

AUDIO PROJECTS, 45 Headingly Lane, Leeds. (0532) 304565. A&R, Audiolab, Creek, Heybrook, Linn, Musical Fidelity, Naim, Quad, Rega, etc. Tues-Fri 9.30-6, Sat 2.30-5.30.

CLEARTONE (Formerly Erricks), Rawson Square, Bradford, (Near John St Market). (0274) 309266. A&R, Linn, Quad, Exposure, Nakamichi, Mission, Denon, Kenwood. Private demo rooms, no appt nec, home trial facilities, free installation, service dept. Access, Visa, licenced credit broker. Mon-Sat 9-5.30 (Tue 10-5.30)

DOUG BRADY, HI-FI, The Forge Cottage, 19 Crossgate, Otley, West Yorkshire LS21 1AA. (0943) 467689. Naim, Arcam, Rotel, Pink Triangle, Meridian, Epos, Castle. Two dem rooms. free install. service. Access/Visa. Open 10-6pm Tues-Sat.

The Choice Dealer Directory

IRELAND

DUBLIN

ERIC WILEY, 85 Beancroft Rd, Castleford. (0977)553066/556774. Arcam Audio, Cambridge Audio, Celestion, Kenwood, Marantz, NAD, Pioneer Reference Piont, Rotel, Technics, Quad. Car audio specialists. Demo facilities. No appts nec. Access, Visa, Lombard tricity credit charge Mon-Sat 9-5.30, closed Wed.

HUDDERSFIELD HI-FI CENTRE, 4 Cross Church St, Huddersfield. (0484) 544668. B&W, Kenwood, Denon, Dual, Arcam, Musical Fidelity, Quad, NVA, Audio Lab, Philips, Mission, etc. Dem facilities - appointment reqd Mon-Sat 9-5.30, Thurs 9-8. Closed Wed. Free installation, credit facilities. Access, Visa.

IMAGE HI-FI, 17 The Springs, Wakefield, WF1 1QE. (0924) 200272 Arcam, Linn, Meridian, Mission, Quad, Rotel, Etc. 2 Listening Rooms Free Parking, DelL & Instal Mon-Sat 9:30-5:30 pm **BADA**

IMAGE HI-FI, 8-10 St Annes Road, Headingley, Leeds, L56 3NK (0532) 789374 Arcam, Linn, Meridian, Mission, Quad, Rotel, Etc. 3 Listening Rooms Free Dem & Instal. Mon-Sat 9:30-6:00pm **BADA**

NORTHERN IRELAND

ARMAGH

LYRIC HI-FI, 84 Bridge Street, Portadown, Armagh, N. Ireland. (0762) 358 059. Linn, Naim, Rega, Arcam, Denon, Rotel, Musical Fidelity, Revox, Mission, Akai, Panasonic, etc. Mon-Sat 10am-6pm **BADA**

BELFAST

LYRIC HI-FI, 163 Stranmills Road, Belfast. (0232) 381 296. Linn, Naim, Rega, Arcam, Denon, Rotel, Musical Fidelity, Revox, Mission etc. Mon-Sat 10-6, Late night Thurs. **BADA**

HI-FI EXPERIENCE, 47-49 Fountain Str, Belfast BT1 5EB. (0232) 249117. Quad, Musical Fidelity, Denon, NAD, Rotel, Pioneer, Kenwood, Mission, Tannoy, B&W. No appts necessary home trial facilities, free install, service dept. Credit facilities available. Open 9-5.30, late night Thurs 9pm.

COUNTY DOWN

ASTON AUDIO, Unit 8, Kings Road Shopping Centre, Kings Road, Belfast. Tel: 0232 402220. Akai, Technics, JVC, Mitsubishi, Samsung, Toshiba, Panasonic, and many more. Demos available, Open Mon-Fri 10-8pm Sat 10-5pm

LAFAYETTE HI-FI, 50 Wellington Quay, Dublin, Tel: 353177 0443. Technics, Denon, Marantz, Sony, Pioneer, Aiwa, Cyrus, Mission, Cerwin Vega. No appts nec, Free Install. Unique trade in service. Credit Cards welcome. Open 10-6 6 days a week.

LONDONDERRY

ZEUS AUDIO, 23a Kingsgate Str, Colrairie, BT52 4LB. (0265) 56634. Marantz, Mission Cyrus, Aiwa, Akia, Alphason, Sony, Pink Tri, Celestion, Rotel. Open Mon-Sat 10-5.30, Closed Thurs **BADA**

SCOTLAND

EDINBURGH

BILL HUTCHINSON Ltd, 43 Clarke St, Edinburgh. (031) 667 2877. AR, Aiwa, Denon, Dual, JVC, Mission, Mordaunt-Short, Omar, Technics, Yamaha etc. Dem facilities. Mon-Sat 10-6. Free installation, instant credit. Access, Visa. Service dept.

GLASGOW

BILL HUTCHINSON Ltd, 43 Hope Street, Glasgow. (041) 248 2857. A.R., Aiwa, Denon, Dual, JVC, Mission, Mordaunt-Short, Omar, Technics, Yamaha etc. Dem facilities. Mon-Sat 10-6. Free installation, instant credit. Access, Visa. Service dept

STEREO STEREO, 278 St. Vincent St, Glasgow G2 5RL. (041) 248 4079. Linn, Naim, Rega, Arcam, Creek, Epos, Exposure, Revox, PT, etc. Mon-Sat 10-6. Interest free credit. **BADA**

GRAMPIAN

HOLBURN HI FI Ltd, 441 Holburn St, Aberdeen (0224) 585713. Arcam, Audiolab, B&W, Celestion, Denon, Dual, Epos, Heybrook, ION, Kenwood, Linn, M.A., Marantz, Meridian, Mission Cyrus, M.S., NAD, Nakamichi, Pioneer, QED, Quad, Revox, Rogers, Rotel, Ruark, Tannoy, Technics, Wharfedale, Yamaha. 9.30-5.30 Mon-Sat **BADA**

ROSS-SHIRE

HIGHLAND ANALOGUE, 'Lismore', Avoch, Ross-shire IV9 8RF. (0381) 20655. Acoustat, Basis, Cary, CAT, Cogan-Hall, Diamond-Acoustics, Ensemble, MFA, NRG, SOLEN. 1 demo room, appts nec, home trial facilities, free installations, owner is trained electronics technician. UK's most northerly high-end dealer. Open 7 days.

WALES

TAYSIDE

J.D. BROWN, 28-36 Castle St, Dundee DD1 9NZ. (0382) 26591. Rotel, Denon, Pioneer, Technics, Aiwa, Mission, Castle, Mordaunt-Short, Celestion, Bose, Infinity. All equipment ready for demonstration. No appt nec, free installation, service dept. Mon-Sat 9-5.30

W.M. COUPAR, 33 Reform Street, Dundee, Tayside. (0382) 29588. Bang & Olufsen, NAD, Technics, Denon, Kenwood, Dual, Nakamichi, B&W, Acoustic Research, JBL. No appointment necessary, free installation, service department. All demonstration systems wired through a demonstration comparator. Licensed credit broker, Access, Visa. Monday-Saturday 9.00 am-5.30.

CLWYD

ELECTRO TRADER, 19 Colwyn Crescent, Rhos On Sea, Colwyn Bay, Clwyd (0492) 48932. Ariston, Arcam, B&W, Hecc, Intinity, Onkyo, Rotel, Tannoy, TDL, Yamaha etc. Dem room. Appls preferred. Home trial. Free installation. Access, Visa, American Express, Diners. 9.30-1.00, 2.00-5.30 Mon-Sat.

ACTON GATE AUDIO, 4 Ruabon Rd, Wrexham, North Wales, Tel: 0978 364 500, Arcam, B&W, Marantz, Mission, NAD, Quad, Rega, Rotel, Tannoy, Yamaha, etc. Dem Facilities, A.V. on dem, Mail Order. No appts nec, home trial fac, Free install, Service Dept. Access, Visa. 9.30-5.30 closed Weds PM

SOUTH GLAMORGAN

AUDIO EXCELLENCE, 134 Crwys Road, Cardiff. (0222) 228565. Great Hi Fi carefully selected and demonstrated by friendly, enthusiastic staff. Closed Mon.

WEST GLAMORGAN

AUDIO EXCELLENCE, 9 High St, Swansea. (0792) 474608. Great Hi-Fi carefully selected and demonstrated by friendly, enthusiastic staff. Closed Mon. **BADA**

GWYNEDD

I&H GRIFFITHS & SONS, 313 High St, Bangor LL57 1YA. (0248) 370655. Yamaha, Tannoy, Teac, Goodmans, Dual, Sherwood, Wharfedale. Demos available, no appts nec, home trial facilities, free installation, service dept. Access, Visa, Lombard credit charge. Mon-Sat 9-5.30, Wed 9-1.

PETERS HI-FI, Victoria Buildings, Mostyn Ave., Craig-y-don, LLandudno. (0492) 876788. 1 single spker dem room. Open 9-5.30, closed Wed. See Cheshire branch for full details.

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The Directory

The ultimate buyer's guide with comprehensive information on every currently available product tested by *Hi-Fi Choice*.

Including test summaries covering

Amplifiers

Cables

Cassette decks

CD players

DACs

Equipment supports

Loudspeakers

Personal stereos

Tuners

Turntables

And much, much more

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 current retail price is placed in its respective category in alphabetical order. The prices of the products are updated on a regular basis, although it should be noted that our value ratings are based on the product's price at the time of review.

The next column contains the ratings for the standard achieved in laboratory and listening tests, with the exception of certain product groups where lab tests were not carried out. One important point to remember is that they cannot be used to compare products from different categories — for example, a cassette deck rated 'excellent' in sound quality will not usually offer the same standard of fidelity as a similarly rated turntable or CD player (unless you can get hold of first generation copies of the master tape!).

The Comments column contains a potted summary based on the original review, emphasising the

salient points of a product's character and sonic performance. The space available doesn't allow for great detail but in the 20 or so words we have attempted to put across the essence of the review, in some cases using quotes from the review itself. Obviously, important information on compatibility or auxiliary equipment used in the test cannot be included, and we would advise you to refer to the original review for this, of which more later. Please note that these comments are those of the reviewer and not, as is the case with some magazines, those of the manufacturer.

The next column varies from category to category but is usually either features or specifications, the former being facilities available on a cassette deck or amplifier or the type of drive system on a turntable.

Specifications vary with product type but usually relate to suitability or capability. For instance, in the case of arm matching, figures are given with the cartridges, which tie in with the mass figures for the tonearms themselves, making it easier to avoid compliance/mass mismatches.

Perhaps the most influential letters in the *Directory* are those found in the Value column, the Rs and BBs denoting the Recommended and Best Buy ratings that are appended to products we consider meritworthy. The Best Buy tag

means that a product not only offers good sound quality, but is reasonably priced as well. With source components a price limit of approximately £300 is usually used as a guide.

Recommended means that either the performance of a product is particularly good irrespective of price or, alternatively, that a good value standard is achieved but overall attainment falls short of Best Buy classification. Please note that an expensive Recommended product will nearly always sound better than a cheap Best Buy. An ideal situation would be to choose suitably priced Best Buy or Recommended products from relevant categories and create a Best Buy system, but, due to the variety in tonal balance that exists in much audio equipment, system building is unfortunately not 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.

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SYSTEM BUILDING

Pre-packaged one-make systems have been commercially very successful, with advantages like cosmetic consistency, competitive pricing, and (assumed) technical compatibility. However, despite the mass market clout of the consumer electronics giants, the hi-fi tradition of specialised separate components seems to be as strong as ever, and certainly represents the route taken by those who place sound quality first.

The first step in putting together a system is to decide which sources you require. There are now three different prerecorded music media competing for the affection 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.

Cassette has never really challenged vinyl's superior quality,

but it's a multiple role format, offering 'go anywhere' flexibility, a useful recording capability, plus a broad catalogue of prerecorded music cassette material. As a hi-fi medium cassette suffers from prerecorded material which has been improving but is still patchy in quality and can usually be bettered by a home recording. There is also the worry that a tape made on a specific machine usually plays best on that machine, which may cause aggravation when upgrading a few years hence.

CD is the relative newcomer but in the last decade it has come to dominate the market. The sound quality remains controversial, hailed as near perfect by its fans but derided by vinyl freaks. It is probably fairest to say that CD is fine for the majority of listeners, but may not suit everyone. Certainly the lack of background noise and deterioration are major strengths.

The advent of two box audiophile players has certainly

helped to gain better acceptance for the format and unless you are prepared to spend a substantial sum, CD arguably offers the best performance in terms of sound per pound. Players are now exceptionally cheap, having been reduced dramatically since the format was launched, however, the prices of the discs remains extortionate.

Choosing the components of a system is only part of the task of getting the system as a whole working as well as possible. Both components and loudspeakers benefit to a surprising degree from proper support in the form of stands that enable them to give their best performance, whether floor-standing or wall mounted.

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 simi-

lar immediate acoustic environment, unencumbered by other furnishings and structure, and a similar distance from listeners, 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 rigid support

The key to getting the best results from a separates system lies in finding an experienced and skilled dealer in the first place, one who takes the trouble to find out what you really want and then demonstrates some likely alternatives.

The *Directory* has been compiled as a guide in the sense that you should use the information in it to make a shortlist of equipment and then audition it before taking the plunge. Tastes inevitably differ and it's unwise to buy purely on the basis of our recommendation, as dealers are the most experienced people around when it comes to making systems work as a whole.

AMPLIFIERS

The amplifier sits at the heart of the system, processing the outputs from all the various music sources as necessary and then driving the loudspeakers. These two (quite separate) functions are integrated into a single box at the low-to-middle price points; separated pre- and power amplifiers become increasingly common as one moves upmarket. At the upper end of the specialist market, valve amplifiers provide a popular alternative to the transistor types amongst enthusiasts.

There is a substantial difference between specialist (sound quality oriented) amplifiers and the consumer electronics style models. The

former are bleakly simple, avoiding all unnecessary features to provide the most direct signal path in the interests of best sound quality. The latter range from models with just basic tone controls and tape recorder switching, to those with elaborate facilities such as graphic equalisers, remote control (including volume), surround sound options etc. etc.

Lab measurement provides some useful data, particularly in regard to an amplifier's ability to drive a wide range of different types of loudspeakers, but this is only obliquely related to sound quality. We also include our measured power output (RMS, 8ohm load, 1 channel

driven) – but again, paradoxically, this doesn't necessarily correspond to the loudness capability of the amplifier, which has as much to do with the elegance of the overload characteristics within a given system (valve amplifiers invariably sound more powerful than their rating would suggest). The listing of features provides some indication to the complexity of an amplifier: many users prefer to retain the option of tone controls to 'shape' the overall sound according to taste; many others have found living without tone controls surprisingly easy, with additional benefits in terms of transparency.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Acoustic Research A03 £170	Average + Average	New slimmed down version of the A04 with less power and facilities but also a slightly 'fuzzy' sound	38W, MM disc, CD direct and 3 aux inputs		74
Acoustic Research A05 £200	Good + Good +	Capitalises on the strengths of the A-03 and A-07 but escapes the ignominy of their deficiencies. The amp for all AR-based systems	67W, 2 tape, 3 line and both MM/MC inputs, Tone defeat	R	97
Acoustic Research A07 £300	Very Good Average +	Relatively smooth but ineffectual sound quality that lacks some weight and impetus at very low frequencies	75W, 4 line, 2AV and MM/MC inputs		68
Aiwa XA-006 £135	Good Average	Competent enough performer with plenty of facilities. A gutsy sound though one that's rougher via CD than MM.	67W, MM and 5 line i/p's plus independent rec out		92
Akai AM-47 £200	Very Good Good +	Something of a surprise from Akai: a made-for-Germany amp with plenty of widgets and an unexpectedly sharp, open and detailed sound. Looks ghastly but sounds strainfree.	104W, 3 tape, 4 line and MM disc inputs. 4mm speaker outlets.	R	104
Akai AM-52 £230	Average + Average -	Basically equipped, this amplifier offers a comfortable but hardly over-detailed sound	95W, MM/MC disc, 5 line inputs, loudness		74
Akai AM-65B £299	Good Average	On-board 18-Bit DAC's actually give better sound than standard CD inputs! Punchy via MM disc	101W, MM, 6 line, digital inputs		80
Akai AM-93 £550	Average Average -	Unfortunately Akai's on-board D/A convertors were less successful than its conventional analogue CD input.	112W, coax and optical dig inputs. MM/MC		68
Albarray PP1 £400-£500	Average Good +	Available with or without various MM/MC disc options, the 'basic' PP1 has an attractively warm, earthy sound. The budget MM stage needs some further work, however.	48W, 4 inputs with extra gain available for low-level sources	R	104
Alphason Apollo £300	Average- Average+	Our early production sample was beset with a variety of niggling problems. Laid-back though not unmusical sound.	54W, 5 line, tape and MM/MC inputs. Solid wood fascia		92
Amadeus Gold £360	Average - Good	There is some indication of instability but otherwise sounds very rich, warm and musical. High-ish IMD	56W, MM/MC plug-in cards, 3 line R inputs		74
Amadeus Silver £270	Average - Good	Limited headroom via disc but still offers a sweet, lush sound. Limited current delivery	37W, MM/MC, 3 line inputs	R	80
Aragon 4004 £1795	Good Good	Despite its imposing bulk, the Aragon is something of a softy at heart. It can deliver oodles of power but its musical presentation is more laid-back	231W power amp		72
Arcam Alpha 3 £200	Good Average	After the enthusiastic reception earned by the older Alpha 2 the generally lacklustre and bland sound offered on this occasion met with (unexpected) disapproval.	53W, 3 line, tape and MM disc inputs. Direct option.		104
Arcam Delta 110/120 £720/£520	Good+ Good	Overall performance is limited by the power amp - in isolation the PDM-preamp offers a remarkably open and detailed sound, particularly in 'digital' mode.	112W power amp, MM/MC + four line inputs + coax/opt digital inp	R/-	92
Arcam Delta 60 £300	Good Good +	Very refined and highly detailed sound via MM and CD without any of the hardness noted via the MC stage	59W, 4 line, MM/MC inputs, no tone controls	R	68
Arcam Delta 90.2 £410	Average + Average +	Dark but slightly dead or conservative sounding version of the original Delta 90. Improved disc stage	73W, MM/MC, 4 line inputs, tone bypass, bi-wire	R	74
Art Audio Quintet £725	Average Very Good	Switchable triode/ultralinear output stage. There's 15W and 15W, but in triode mode these are 15 of the sweetest watts around. Surprisingly gutsy	15/25W, variable feedback	R	100
Audio Innovations Series 1000 2nd Audio Amp	Poor Excellent	This valve combination offers awesome dynamic range with superb transparency and power to match. Compatibility with other brands is unpredictable	15W, MM, 6 inputs, monoblocks	R	63
Audio Innovations Series 200 £449	Poor Very Good	Like most 'Innovations valve power amps, compatibility with other brands is unpredictable. Hardly a powerhouse, but nicely 'open', transparent and dynamic sound in small(ish) systems	12W	R	77
Audio Innovations Series 300II £500	Poor Good +	Under-powered and over-distorted yet capable of realising an open and captivatingly expressive sound. Sensitive speakers are a must	9W(!) integrated valve amp with tape, 3 line and MM disc inputs	R	97
Audio Innovations Series 400 £669	Poor Very Good	Superior styling and better build quality than the Series 300 make for a very attractive integrated valve amp. Capable of fine results in the right system, but can sound too 'thin'	12W, MM and 4 line inputs	R	77
Audio Note Ongaku £34,000	n/a Excellent	An out and out audiophile product, a single ended, zero negative feedback, triode, line level integrated amp. Probably the best amplifier in the world!	6 line inputs, 27W	R	Coll '90
Audiolab 8000A £410	Very Good Very Good	Recent mods have cured the slightly glassy treble, replacing it with a smoother but richer and more solid style of music making	81W, 3 tape, 4 line and both MM/MC inputs. Tone defeat	R	97
Audiolab 8000C/8000P £375/£545	Very Good Good	Audiolab has revamped its pre/power combo though the very distinctive almost stark neutrality that results will not appeal to all listeners. Good value engineering, nevertheless	157W pow amp + bi-wire outputs. 3 Tape, 4 line + MM/MC on preamp		97
Audion CD-1 £399	Average + Very Good	Nicely presented valve (line-only) preamplifier with fine bandwidth and enjoyable, musical sound. Great if you can justify the cost. Well worth hearing	5 line inputs		77
Aura VA-40 £190	Average Average +	Based on ITL's earlier MA80, this amp sounded slightly withdrawn or 'dead' if inoffensive	55W, MM 4 line inputs, MOSFET output		80
Aura VA-50 £200	Good Very Good	Superficially similar to the cheaper VA-40 but with much more of the old MA-80's magic! Great sound from a slimline package	65W, one tape, 4 line and MM only. New tape monitor switch	BB	97
Beard Audio CA35/P35mkII £695/£895	Average + Very Good	Good build quality and a very smart finish combine with a characteristic valve sound to make a first class amplifier capable of giving hours of musical enjoyment	35W, MM/MC, 4 inputs	R	63
Beard M70 £1995 pair	Good Good +	A substantial British monoblok power amplifier, but not a great deal more impressive than the P35 at half the price	70W		50
Bryston 0.5B/2B £695/£695	Very Good Good	Very rugged Canadian pre/power combo that sounds cool, confident and punchy. Headamp available to suit MC cartridges	65W, MM and 4 line sources, overload LEDs on power amp	R	74
Bryston 12B/4B £1295/£1395	Good + Good	Bryston's massive 4B power amp stood out as the backbone of this combo, the preamp sounding a trifle unbalanced between MM and MC inputs	272W, bridgeable to 800W. 6 line, 2 disc inputs, subsonic filter		68
Cambridge P25 £180	Good+ Average	Despite clocking-up a solid set of measurements the sound of the P25 proved to be as grey as its appearance.	37W, 4 line and MM/MC inputs + tone defeat		92
Cambridge P50 £200	Good Average	A pleasant enough sound with full bass yet with a slightly mechanical quality that reduced its sense	56W, 4 line inputs + MM/MC + tone		85

AMPLIFIERS TRU-FI EXTENDED PAYMENT SCHEME

*Pioneer A300	£159.99.....	18 months	Sony TAE1000ES	£699.99.....	20 months
Pioneer A400	£239.99.....	18 months	Sony TAN55ES	£349.99.....	20 months
Pioneer A676	£279.99.....	18 months	*TEAC AX1000	£129.99.....	18 months
Sony TAF440	£179.99.....	18 months	TEAC AX5000	£229.99.....	18 months
Sony TAF540	£229.99.....	18 months	Technics SUVX700	£249.99.....	12 months
Sony TAF670ES	£399.99.....	20 months	Technics SUVX800	£459.99.....	12 months
Sony TAF770ES	£599.99.....	20 months			

COMPACT DISC TRU-FI EXTENDED PAYMENT SCHEME

*Aiwa XC700	£179.99.....	12 months	TEAC CDP4500	£249.99.....	18 months
Pioneer PD8700	£299.99.....	18 months	TEAC CDZ5000	£369.99.....	18 months
Pioneer PD9700	£399.99.....	18 months	TEAC P-500	£649.99.....	24 months
Sony CDP791	£199.99.....	18 months	TEAC D-500	£329.99.....	24 months
Sony CDPX222ES	£299.99.....	18 months	Technics SLP5700	£259.99.....	12 months
Sony CDPX333ES	£399.99.....	18 months	Technics SLP5900	£369.99.....	12 months
TEAC CDP3100	£159.99.....	18 months			

CASSETTE DECKS TRU-FI EXTENDED PAYMENT SCHEME

Aiwa ADWX777	£189.99.....	16 months	Sony TCK870ES	£349.99.....	20 months
Aiwa ADWX717	£189.99.....	16 months	TEAC V3000	£199.99.....	20 months
Aiwa ADF810	£199.99.....	16 months	TEAC V5000	£299.99.....	20 months
Pioneer CT676	£249.99.....	18 months	TEAC V7000	£399.99.....	20 months
Pioneer CT900S	£499.99.....	18 months	TEAC V8000S	£699.99.....	20 months
Sony TCK570	£199.99.....	18 months	Technics RSBX606	£179.99.....	12 months
Sony TCWR770	£249.99.....	18 months	Technics RSBX707	£219.99.....	12 months
Sony TCK677ES	£249.99.....	20 months	Technics RSBX808	£299.99.....	12 months

TUNERS TRU-FI EXTENDED PAYMENT SCHEME

Pioneer F555	£199.99.....	18 months	Sony STS770ES	£299.99.....	20 months
Pioneer F91	£359.99.....	18 months	Technics STG570	£179.99.....	12 months
*Sony STS370	£139.99.....	12 months	Technics STG70	£219.99.....	12 months
Sony STS570ES	£199.99.....	20 months	Technics STG90	£319.99.....	12 months

D.A.T. TRU-FI EXTENDED PAYMENT SCHEME

Sony DTC750	£449.99.....	18 months	Sony TCDD3	£499.99.....	18 months
Sony DTC77ES	£999.99.....	21 months			

L.D.P. TRU-FI EXTENDED PAYMENT SCHEME

Pioneer CLD1450	£499.99.....	20 months
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TURNTABLES TRU-FI EXTENDED PAYMENT SCHEME

Goldring Excelda I	£159.99.....	12 months	Technics SLDD33	£129.99.....	12 months
Technics SLBD22	£119.99.....	12 months	Technics SL1210 MkII	£335.99.....	12 months
Technics SLQD33	£159.99.....	12 months			

LOUDSPEAKERS TRU-FI EXTENDED PAYMENT SCHEME

B&W DM610	£199.99.....	18 months	Mission 764i	£479.99.....	21 months
B&W DM620	£299.99.....	18 months	Mission 765	£699.99.....	21 months
B&W DM630	£599.99.....	20 months	Mordaunt-Short MS5.30	£199.99.....	20 months
B&W DM640	£799.99.....	20 months	Mordaunt-Short MS5.40	£299.99.....	20 months
B&W Solid	£199.99.....	18 months	Mordaunt-Short MS5.50	£399.99.....	21 months
B&W Bass Station	£349.99.....	18 months	Mordaunt-Short Classic 20	£395.99.....	21 months
B&W ACT100	£199.99.....	18 months	Mordaunt-Short Classic 40	£595.99.....	21 months
Mission 761i	£179.99.....	18 months	Wharfedale 505.2MAH	£259.99.....	20 months
Mission 762	£199.99.....	18 months	Wharfedale 515	£259.99.....	20 months
Mission 763	£299.99.....	20 months	Wharfedale 517	£379.99.....	21 months

HOW TRU-FI EXTENDED PAYMENT SCHEME WORKS

EXAMPLE: Sony TAF440	£229.99
Sony CP791	£199.99
B&W DM610	£199.99
TOTAL	£629.97
LESS 10% Minimum Deposit	£62.97
BALANCE 18 months at £31.50	= £567.00

* Cannot be supplied without other equipment.

SALE CLEARANCE

AURA A40 Amplifier	£109.99
AIWA ADR505 Cassette	£109.99
MORDAUNT SHORT MS3.10 Speakers	£77.99
WHARFEDALE 410 Speakers	£99.99
WHARFEDALE 420 Speakers	£125.99
WHARFEDALE 430 Speakers	£174.99

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AMPLIFIERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Carver CM-1090 £595	Average Average +	Looks very professional with its meters and handles but suffers from a loose and dirty sound that shies away from busy tracks	141W, 2 tape, 4 line and MM disc. Sonic Holography feature		97
Cello Audio Suite £1200	Excellent Excellent	Cello's preamp represents a whole new ball game in flexibility and sound quality (or war of attrition on your wallet)	Optional inputs MC etc	R	50
Chord SPM-900 £1850	Average + Good +	Technically very interesting, this mini-powerhouse uses a switched-mode supply to deliver a crisp and refined sound	236W with protection into lower loads	R	85
Concordant Excelsior £856	Very Good Excellent	Cottage industry styling might not inspire confidence, but sonically this preamp is tremendously vivid and detailed. Real high-end performance. We loved it!	MM plus 3 line inputs, External power supply	R	77
Concordant Exultant £700	Average+ Very Good	Individual appearance of this valve pre contrasts with sonic invisibility. An extremely dynamic performer. Recommendation withheld pending more appropriate p.s. plug	3 line, MM, variable gain		100
Conrad-Johnson PV-10 £1100	Excellent Excellent	Pricey, yes, but a fabulous preamplifier which confirms C-J's high reputation in the States. Beautiful imaging, superb detail, plenty of gain on the phono stage - classy build quality too.	MM plus 4 line inputs	R	78
Conrad-Johnson Premier 7A £8995	n/a Excellent	Price has increased since we tested it - but at this price who cares? The 'Seven is designed without compromise, and it's clearly one of the finest (valve) preamplifiers money can buy.	MM, 4 line inputs, sep. Rec Out, versatile cartridge matching	R	Coll.'90
Creek CAS 4040s3 £200	Good Good	Now in mk3 guise the '4040 offers a dry but tidy sound via disc and one that's slightly leaner and better focussed on CD.	41W, 3 line and one MM disc i/p. Tone controls.	R	92
Creek CAS 4140s2 £230	Average Good	Disc headroom still poor but the open and detailed, if slightly bright, sound wins through	40W, MM/MC, 3 line inputs, mono R and mute	R	80
Creek CAS-6060 £470	Good Good	An amp that looks like the '5050 but employs the sort of big, confident and meaty-sounding electronics used in the earlier '4040. Dynamic and impressive.	81W, 3 line, 2 tape and MM/MC disc inputs. Bridge-mono facility		104
Croft Series 4S £850	Good Good	The original IV is still available now supplemented by the higher price and power (S); both are fine performers	40(60)W channel	R	57
Croft Series 4SA £1000	Good Very Good	Featuring tuned components chosen for their sound quality, the 'A' variant is an impressive example of Croft's technique in valve design	60W special supply regulation	R	57
Croft Super Micro A £549	Average + Very Good	The looks are somewhat improved, while this 'hot rod' version with tuned components performed very well indeed. There is still no gain on the line inputs. Now in mk.II form	4 inputs, MM, straight line	R	57
Croft Super Micro A OT/Series V £689/£555	Average+ Good	Micro is still unashamedly "cottage" but offers good performance. Combo is let down by the very low powered Series V	15W, valve, dual vol.control, 2 line, MM, tape out		100
Cyclone Catalyst £1995	Good + Very Good	Exceptionally load tolerant and very refined in delivery. Extra options available in future	74W, external MM or MC stages, 3 R line inputs	R	80
Cyrus I £230	Very Good Very Good	Crisp, meaty and exquisitely detailed, this latest Cyrus amp had us enthralled via CD. MM/MC enjoyed a lesser clarity	34W, 4 line + MM/MC i/p's with dual-conc vol.	R	85
Cyrus II £350	Very Good Very Good	Recently updated this popular favourite captured our attention, once again, with its robust and very convincing sound.	60W, 4 line and both MM/MC disc. R No tone controls	R	92
Cyrus PSX £250	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
DNM 3A From £1	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
Deltec DPA 100S £2200	Very Good Very Good	A top-quality transistor power amp, sounding fast, articulate and well controlled, though maybe a touch clinical for some tastes	80W	R	50
Deltec DSP-50S/DPA-50S £725/£925	Excellent Excellent	Remarkable pre/power combo based around the highly linear DH-OA32 hybrid op-amp. Unmatched detail resolution, control and transparency	63W, external feedback wiring. 3 line, MM/MC no tone controls	R	68
Denon DAP-2500/POA-4400A £550/£600 pr.	Very Good Good	Denon's fully-fledged preamp also incorporates D/A converters that did not improve the sound of our £299 CD player. The power amps are brilliant!	172W, monobloks Opt/Coax dig + 2 tape, 4 line and MM/MC inputs		68
Denon PMA-250II £130	Good Good +	Spacious yet tactile and gutsy sound via all inputs. Worthwhile upgrade over original PMA-250	53W, MM 3 line inputs, source-direct	R	80
Denon PMA-350 £160	Average+ Good	Bold claims were made at its launch but the sweet and inoffensive sound, though very pleasant, is not mould-breaking at the price.	88W, 5 line and MM disc inputs + source direct.	R	92
Denon POA-6600 £1000 p	Excellent Very Good	Delivers abundant high quality sound, solid engineering expertise and content clearly compensating for any compromising of purist audiophile principles - now in revised A form	250W monoblok, remote power	R	60
Dual CV600RC £150	Good + Good	The heart of Dual's latest budget range enjoys a very lively, open and vibrant sound. Slightly sanitised via CD perhaps, but still damn good for a features-first integrated amp!	63W, 3 line, 2 tape and MM inputs. Remote control	R	104
E.A.R. 549 £3628 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
E.A.R. 802/509mkII £1098/£1868	Average Very Good	Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100W, MM, 6 inputs, monobloks	R	63
Entire Sound EX50 £500	Average- Average+	A new and fairly costly Mosfet power amp of limited output. Resolution of detail is pretty good but sound is cold-hearted.	40W Power amp. Internal P/S included for ES preamp.		92
Exposure VI/VII*/VIII £1580	Good Very Good	An established company like Exposure could do more to improve the 'look' of these amps which, nevertheless, sounded confident, dry and musical. Dual version no longer available	63W, Super mod. 4 line and 2 disc R inputs with full rec-out switching	R	68
Exposure VII/VIII £530/£580	Very Good Good	Supplied as a combination without the separate preamp power supply, this pre power combination performed satisfactorily especially on the moving coil input	50W, MM/MC, 3 inputs, straight line		62
Exposure XI/XII/VIII Super £1900	Good Very Good	New preamp and improved power amp led to a smooth and refined sound, MM/MC less transparent than CD	61W, MM/MC, 5 line inputs	R	80
Goodmans GSA-600 £140	Good Poor	Designed to form the heart of a Goodmans separates system, the wishy-washy and faceless sound of this amp fails to stack up	76W, tape, 3 line and MM inputs. Remote control		97
Grant G60AMS £948 pr	Good Very Good	This neat and compact 60W valve monoblok gave good sound on the 8ohm tap, better still on 4ohms. The midrange was particularly natural	60W monobloks 8ohms	R	57
Hafner SE-100/SE-120 £370/£380	Good + Good +	The smallest of Hafner's pre/power range but still imbued with the open, sparkling quality of their bigger models. Preamp sounds significantly better via CD than MM or MC	96W, bridging option. 2 Tape, 3 line + Aux or MM/MC	R	97
Hafner XL-600 £1200	Very Good Very Good	Sounds remarkably open, transparent and inherently 'musical'. XL-600 is tremendously powerful and very compatible	426W in stereo mode, 1.5kW in bridge	R	74
Harman Kardon Citation 25/22 £699/£899	Good Average +	Not as outrageous as previous Citation amplifiers but neither as punchy nor exciting in the sonic stakes. A good all-rounder but lacks sparkle	138W, MM/MC full range of input and record out		74
Harman Kardon HK6100 £170	Good Good	Re-packaged version of the popular PM635. Still offers very up-beat and exciting sound	47W, MM, 5 line inputs, tone controls	R	80
Harman Kardon HK6200 £250	Good Good	Supposedly a beefier version of the HK6100 but in practice there's little to distinguish the two amps	50W, 5 line inputs + MM, tone controls		97
Harman Kardon HK6300 £330	Good Average +	This amp offers the features of the HK6500 with an internal design culled from the HK6200. Unfortunately its generally bright, grating and mechanical sound is no match for either!	61W, 3 line, 3 tape and MM/MC inputs. Loudness button		104
Harman Kardon HK6500 £380	Good+ Good+	The best of HK's current range. A firm sound that enjoys an impressive grip on the most complex music. Great bass!	74W, 3 line, 2 tape and MM/MC. Tone controls + loudness	R	92
Harman Kardon HK6600 £500	Good + Average +	This amp comes as a real disappointment after the HK6500. Differences in design yield a flat and uninspiring sound	87W, 2 tape, 4 line and MM/MC inputs. Tone defeat		97

AMPLIFIERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Harman Kardon HK6800 £700	Good + Good	Smoother and more evenly paced than previous H/K superamps, this model sounded both confident and nimble. A fine result	115W, 4 line + 2 tape i/p's + MM/MC	R	85
Heybrook C3/P3 £479/£660	Average + Average	Since we last looked at this combo Heybrook has improved the manufacture of its power amp though flaws in the preamp's disc input remain unchecked	146W, oodles of current, passive line inputs		104
JVC AX-A3TN £140	Very Good Good	A true minimalist amp from the masters of mass-production! Offers a very comfortable, accessible sound yet with some loss of deep bass and extreme treble.	50W, 3 line, 1 tape and MM i/p's. CD DirT and 'Bass Compensator'	R	92
JVC AX-A441 £210	Good+ Average	A return to the traditional style of mass-market design brought an inconclusive reaction from our panel. Blowing 'hot and cold', our listeners ultimately found its music uninteresting.	93W, 3 line, 3 tape, MM/MC inputs. CD direct facility		104
Jadis JP30/JA30 £4990/£4900	Average Excellent	Two-box preamp plus monoblok power amps, classic valve design gives stereotypical valve sound. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at	30W 2-box pre-, monoblok power, MM-only, 4 line inputs	R	60
Jeff Rowland Coherence One/Mod	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 loading options. Balanced topology	R	72
Kelvin Digital Integrated £550	Good + Very Good	Not so Class A as before but now fitted with a PDM DAC which offers a smooth, detailed and naturally 'musical' sound	34W, digital, line and MM i/p's only	R	85
Kelvin Integrated £449	Good Good	Recent mods have reversed the Integrated's previous good fortune, this unit was just too syrupy.	21W with 10-12W in Class A. Four line + MM/MC.		92
Kelvin Labs Absolute Zero/M30 £395/295/595	Good + Average +	Latest versions of the M30 offers a true 30W Class A and a slightly muddled but very comfortable sound. MC preamp is a very linear design	33W monoblok MC only + 4 line inputs. Separate L/R balance	R	74
Kenwood KA-3020 £140	Good + Good +	An unassuming little amplifier that turns in a remarkably balanced and entertaining sound. Lively, detailed and engaging	66W, 2 tape, 3 line + MM disc. Source direct	BB	97
Kenwood KA-4020 £170	Good + Average +	On paper this is a beefier version of the '3020 yet our listeners thought it sounded weaker, lacking richness and detail	103W, 2 tape, 3 line + MM/MC Source direct		97
Kenwood KA-4040R £220	Good + Average +	In many respects this sophisticated amp is a 'digitised' version of the KA-4020 with relay-switched inputs and full remote control. Unusual looks but can seem insubstantial via CD.	82W, 3 line, 2 tape, MM/MC inputs. Full remote control		104
Kenwood KA-5020 £220	Very Good Good+	Something of a powerhouse on the cheap this amp can keep pace with the most challenging of dynamics. Its sound is vibrant but some fine detail is lost.	115W, 3 line, 3 tape and MM/MC. Source direct.	R	92
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
Leccion Quattra £350	Average+ Good	Underpowered but with the flexibility of four independent power amps. Very deep, captivating sound with 3D soundstaging.	19W via all 4 channels. 5 line and MM/MC inputs	R	92
Leccion Stereo £200	Poor Very Good	Can reflect the full weight and ambience of a tense, classical performance. A genuinely deep, detailed and enthralling sound marred by unreliability of our sample. New stock will be cured.	76W, 4 line, 2 tape, MM/MC inputs.		104
Lelectron JH50 £2300	Average Very Good	Sexily presented valve power amplifier from France. Lovely valve sound too, with delicate and airy top end. Not especially powerful and rather expensive but very desirable!	50W		78
Linn Intek £398	Good + Average +	Linn have slashed its price and made various internal revisions, but their no-nonsense Intek still lacks the authority and confidence to support its forward balance.	55W, 3 line, 2 tape, MM/MC inputs, rec-out, mono + mute		104
Linn LK1/LK280 £598/£763	Good Good -	A very modern, logic-controlled amp with distinctive and inoffensive sound quality. Its restrained sound could do with extra insight and zip.	84W, compact amp CMOS sw. for 2 tape, 2 line and MM/MC. xlr sockets		68
Linx Nebula £500	Average + Average +	Ambitious both in style and design this amp was less impressive in the sonic arena — positive but two-dimensional	88W, logic-controlled i/p switching		85
MFA Magus £1147	Good Very Good	Versatile valve preamp from USA, genuine MC compatibility and high class construction make the Magus a bargain	3 line, MC, tape out, variable gain	R	100
Magnum MP150/MF150 £320/£320	Average + Good	This is no technical masterpiece but the strain-free, fluid sound augers well for CD-based systems. Excellent value	89W, 3 line + MM/MC i/p's. No tone cont.	R	85
Marantz PM-30 £130	Good + Good +	The building-block for Marantz's popular budget 'SE' amplifier is no slouch, providing a lively and very expressive sound with plenty of strong bass. A good 'un.	49W, 3 line, 2 tape and MM inputs, source-direct	BB	104
Marantz PM-30SE £150	Very Good Good+	The breathed-on version of Marantz' PM-30 offers an engagingly detailed and spacious sound though one that's warmer via MM disc than CD.	50W, 3 line, 2 tape and MM disc. Source direct	R	92
Marantz PM-40SE £240	Very Good Good +	The improved version of their basic PM-40 model has itself been updated to provide a bigger and more exciting sound. A good 'un	61W, tape, 3 line + MM/MC disc. Source Direct	R	97
Marantz PM-50 £260	Good + Average +	One of Marantz's new breed, the PM-50 has a big and beefy sound yet one that lacks refinement	92W, MM/MC, 4 line inputs, source- direct		80
Marantz PM-75 £500	Good Average	More successful than most amps with on-board DACs but still not as balanced as other Marantz products	136W, opt/coax dig inputs, 6 line + MM/MC		68
Marantz PM-80 £400	Very Good Good +	Technically robust with an equally beefy and tactile sound. Great sense of power and control but spatially a little flat	133W, 3 tape, 4 line + MM/MC. Class A option	R	85
Meridian 201/205 £760/£525each	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
Musical Fidelity A1 £299	Average + Average +	Just scraping a recommendation, this current A1 sounded lush but sleepy — lacking the bite and sparkle of old	26W with 9W of Class A. 4 line + MM/MC inputs	R	85
Musical Fidelity A100 £499	Good + Very Good	This is another one recommended for fine sound with which you could keep your Chinese carry-outs warm	50W MM/mc 5 inputs straight line	R	62
Musical Fidelity B1 £200	Average + Good +	The subject of much controversy, this 50W wonder offers a very deep, solid and powerful sound	50W, MM/MC, 5 line inputs, tape monitor	R	80
Musical Fidelity B200 £349	Very Good Good +	Running cooler than other MFs, the B200 delivered fine musical and dynamic sounds with plenty of power	80W MM/mc 4 line inputs straight line	BB	62
Musical Fidelity MA50 £875 pa	Good Excellent	An audiophile bargain. One of the best sounding power amplifiers made	50W, monoblok	R	62
NAD 3020i £150	Very Good Good +	The most balanced and communicative of NAD's 3020 series. Great at revealing subtle musical clues without aggression	31W with tone controls, 3 line + MM inputs	BB	85
NAD 3225PE £160	Average + Average +	Light and detailed if not as rich or weighty sounding as others. MM input sounds warmer than CD	42W + 70W dyn. headroom; soft-clipping, MM only	R	68
NVA P70MC/A60 £830	Average Average +	NVA's speaker cables are a must, the amp offering well-integrated but not particularly crisp sound	68W, MC, 3 passive line inputs		80
Naim Separates £750 pl	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	40-70W, MM/MC etc	R	60
Onix OA-21s/SOAP £350/£180	Average + Good -	Via MM disc this amp comes alive with a fresh and vibrant sound though its CD input sounds utterly dead by comparison.	60W, 1 tape, 3 line and either MM or MC. Outboard PSU option		97
Orell SA-040 £359	Good Good +	This promising newcomer from a brand new company sounded pretty good and should improve as production settles	45W MM/MC, 4 line inputs, straight line	R	56
Orell SA-040SE £400	Average Average +	Very natural, relaxing if not overly exciting via CD, the sound closed-in to become 'pinched' or fettered via disc	64W, 5 line + MM/MC i/p's. Tweaky components.		71

AMPLIFIERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Philips DFA-888 £300	Good Average	As above but including a modified disc input and onboard DAC. Sounds tight but also slightly thin	107W, as above + opt and coax digital inputs		74
Philips FA-880 £200	Good Average	A new and cheaper design from Philips that sounds best via MM disc. Can appear soft and unbalanced via CD	108W, MM/MC source-direct tone		74
Philips FA-890 £230	Good + Good -	Based on their FA880 model but tarted-up with a remote control facility. Inoffensive, civilised but unexciting sound is retained	120W, 6 line + MM/MC logic-controlled input switching		97
Pioneer A-229 £130	Average + Average	An unambitious amplifier that fights shy of tricky speakers with a sound that's equally unadventurous. Slightly soft and comfortably even-handed presentation	60W, 2 line, 2 tape and MM inputs, loudness and direct		104
Pioneer A-300 £160	Very Good Good	The cheapest of Pioneer's dynamic duo gives off its best with CD rather than MM disc which failed to shine quite so brightly.	55W, 3 line, 2 tape and MM. Independent rec out facility.	R	92
Pioneer A-400 £240	Very Good Very Good	Pioneer's design concept snaps into focus with the A-400, an amp that seems to bubble with musical detail. A bench-mark that other manufacturers should strive for.	71W, 3 line, 2 tape, MM/MC Independent R-out switching.	BB	92
Proton 520 £115	Average Average	Very well equipped budget amp with a slightly flat and undynamic sound - acceptable at the price though	31W, MM/MC with variable MC gain, 4 line inputs	R	74
Proton AP-1000/AA-1150 £250/£395	Good + Average +	Bags of headroom available from this pre/power combo, but can seem bloated or unrefined via MM	67W, MM/MC, adjustable MC gain, 5 line inputs		80
QED A240 CD II £249	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 A270CD/PA £369/£429	Good Good +	Recent updates have bolstered the output of the A270 without adding to its colourations. The PA option is a touch expensive	61W, 2 tape, 3 line + MM or MM/MC from PA board	R/-	97
QED C300/P300 £329/£370	Good Good	A cost-effective combo, limited in its resolution but no less beguiling as a result. Disc stage is sweeter but samey	58W, 2 tape, 3 line, MM/MC + mono/biamp opt.	R	85
Quad 34 £366	Very Good Average	This well-built durable preamp has useful filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4 inputs MM/MC tone controls		44
Rational Audio £175	Average- Average+	This wacky newcomer from Czechoslovakia offers a very open and fluid sound via CD but its performance via MM depends very much on the cartridge's load impedance.	129W, caters for line and MM disc sources but has no i/p selector.		92
Ray Lumley Model 75 £1995 p	Average Good +	Monstrous valve monoblocks which represent good value. What they lack in musical subtlety they make up for in sheer muscle. And these are Lumley's small monoblocks!	75W monoblok		78
Revox B150 £1047	Very Good Average +	Beautifully constructed but hampered by Revox's convoluted logic control. Open and smooth sound. Still costly.	117W, CMOS sw. for 3 line, 2 tape and MM		68
Revox B250 £1467	Very Good Good	With much improved sound over its predecessors plus amazing remote control facilities, this could form the heart of a round-the-dream-house system	150W MM/MC system/house remote tone controls		56
Rose RV-23 £395	Good Very Good	Beautifully built classy British 'hybrid' preamplifier. You can spend more to get a more transparent sound but it's hard to criticise the Rose given the competitive price	MM plus 3 line inputs	R	77
Rotel RA-930AX £160	Good - Very Good	Based on the original RA-820AX but featuring a new look and a tweaked circuit design, this budget wonder captivated our listeners with its clean, vibrant and thoroughly involving sound	53W, 3 line, tape and MM inputs, tone bypass	BB	104
Rotel RC-960BX/RB-960BX £150/£180	Very Good Good -	With excellent standards of construction, flexibility and plenty of power under the bonnet, this duo represents an ideal choice for the first-time buyer.	80W, bridge-mono facility. 3 line, 2 tape and MM/MC on preamp	R	104
SAE P102/A202 £499/£599	Average + Average +	Microprocessor-controlled pre and power amp that sounds much better at low rather than high volume levels. Pro-oriented aesthetics	151W, MM/MC + 2 liner and 2 tape, tone memory, spk switching		74
Sansui AU-X111 £100	Good Average	Sansui has engineered an amp that's both solid and flexible for the price, but its sound is rather bland compared to competition in the £110 sector	5 line inputs, MM, 52W		92
Sansui AU-X911DG £700	Very Good Good +	At its best when used with the on-board MASH/PWM DAC where it sounds technically neutral but still emotionally charged	112W, 4 dig, 3 line and MM/MC i/p's. Rec-out	R	85
Sony TA-F440E £180	Very Good Good	A new budget amp based on tried-and-tested circuits but free of spurious widgets like tone controls. It has a fresh and up-beat sound with plenty of detail, can sound smeared via CD	109W, 3 line, 2 tape and MM + rec out	R	104
Sony TA-F540E £230	Very Good Good -	An extra £50 buys you an MC input but little else over and above the TA-F440E. This version sounds more consistent from input to input but is still rather superficial or unconvincing	108W, 3 line, 2 tape, MM/MC + rec out		104
Sony TA-F730ES £450	Very Good Good	A very stable and coherent amp but one that lacks a crucial sense of involvement	133W, MM/MC, 3 tape, 2 line, full rec-out		80
Sound Audio VP3a/HBP60a £599/£599	Good Average ++	Hybrid power amp and valve line stage. Big 'n' beefy power amp is the stronger partner	4 line, 1tape 60W	R	100
Sugden A21a £395	Average+ Good	The modern-day relative of Sugden's original Class A amp and one that offers a smooth, easy-going sound. Best partnered with sensitive speakers.	25W power amp with a good 16W inPure Class A.		92
TEAC A-X400 £115	Average Average	Sibilance and a lack of crisp vitality hamper the performance of this amp, as does the stringent protection circuitry	59W, 4 line + MM + tone + mic i/p level control		85
TEAC A-X5000 £229	Good Average -	This amplifier is compromised by a grey and muddled sound that taxed the concentration of our listeners. Better via MM disc	107W, 3 tape, 3 line + MM/MC Source Direct		97
Technics SU-810 £130	Average + Average	Our sample started off sounding fast, taut and well-integrated yet eventually failed on the MM disc input	66W, 2 tape + 3 line + MM. Tone + loudness		85
Technics SU-VX600 £200	Good + Good	What looks like a fairly ordinary mass-market offering is actually the first 'tweaked' amp from Technics, its solid and sharply focussed sound a taste of things to come.	90W, 3 line, 2 tape, MM/MC + power-amp inputs	R	104
Technics SU-VX800 £450	Very Good Average	On the other hand, this is a mass-market amp still hampered by over-enthusiastic protection circuits! It sounds raw and congested when the going gets tough - positive but raucous	148W, 3 line, 3 tape, balanced input + MM/MC		104
Threshold FET 10e system/	n/a Very Good	Almost valve-like limpidity and excellent soundstaging are star qualities of the Threshold amps. Line input resistive loading is too low	Component FET phono stage, line pre, FET power amp 100w		Coll. '9
Woodside SC26/STA35 Renaiss	Good Good+	Synergistic pairing with a cool, controlled sound, good focus and transparency. More about poise than grunt	35W, valve, 3 line, optional MM or MC, 2 tape outs		100
YBA 1 power amp £2995	Good Excellent	This equally well finished power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85W	R	62
YBA 1 preamp £2895	Very Good Excellent	A front line French audiophile product. Great stereo and a fine Krell style finish	MM/MC, 3 inputs, straight line	R	62
YBA 2 pre & pwr £1395/£1695	Very Good Very Good	Superbly finished French separates, with very good space and transparency, slightly softened bass. Needs extra transformer (£300) for MC cartridges	70W MM (MC extra) straight line	R	56
YBA Model 3 £995/£9	Good Good	Suited to highish sens. loudspeakers this duo produced see-through, ethereal stereo images that were more convincing towards the centre of the soundstage than at the edges	56W stereo amp MM only with 3 line i/p's.		72
YBA Model 3 £995/£995	Good Good	Suited to highish sens. loudspeakers this duo produced see-through, ethereal stereo images that were more convincing towards the centre of the soundstage than at the edges	56W stereo amp MM only with 3 line i/p's.		72
Yamaha AX-330e £100	Average + Average +	An improvement on earlier efforts but still a little bland or lack-lustre. Very compatible though	48W, MM, 3 line inputs, source-direct option		80
Yamaha AX-750 £399	Very Good Average	Big and bulky with remotely-controlled input and volume. Impressive handling, but two samples split the opinion of our listeners, one sounded squashed the other fast and articulate	149W, 3 line, 2 tape, MM/MC inputs + remote control		104

CABLES AND CONNECTIONS

Although cables and connections are sometimes thought to be the least important items in an audio system there has been a growing awareness in recent years that they have a significant effect on sound quality. To this end there is now a vast array of exotic cables and interconnects available to those interested in experimentation. The key observation on cables is that they are much more than mere accessories. Carrying the audio signal, just as any amplifier does, it's really not too surprising that they can influence sound quality.

The characteristics of any cable are determined by the materials and topologies utilised in its construction. The purity of the conductor, nature of the insulator dielectric, mechanical construction, physical geometry, RF characteristics, efficiency of screening and finally the connectors themselves, all play vital roles in the sonic character. These factors tend to vary more with interconnect cables which are used to carry the signal between active components like pre and power amplifiers. The interconnects summarised here were tested in 1m terminated lengths and therefore the results and prices relate

to that length - some cables may well perform differently when used in longer lengths. What's more, most cables are significantly cheaper if you are prepared to fit the plugs yourself. The features column contains information on the material makeup of the different cables with the following abbreviations: OFC - oxygen free copper, OFHC - oxygen free high conductivity (Audionote defines HC as high crystal), PC-OCC - pure copper by ohno continuous casting, LC-OFC - linear crystal oxygen free copper.

CABLES - INTERCONNECT

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Audio Note Copper ANA £44	Average Good	ANC sounded punchy with a faintly lean but tightly-focused bass character. This crystalline precision waned slightly at higher frequencies	OFHC copper twin-axial	R	59
Audio Note Flexible Silver ANS £99	Average Very Good	ANS scored a hit with its transparent midband and revealing but quite unforced treble quality. Bass transients were slightly softened	Silver signal & Copper screen	R	59
Audio Note Silver ANV £154	Poor Excellent	Far weightier-sounding than the flexible ANS, ANV interconnect also possesses a fair degree of treble clarity and sparkle	21 strand silver Litz		59
Audio-Technica AT-6115 £40	Very Good Average	This cable sounds somewhat 'quieter' than the original LC-OFC interconnect, but is also less transparent and three dimensional	PC-OCC copper coaxial		59
Audioquest Livewire Ruby £49	Average Good	Smother sounding than the Topaz, the extended crystal Ruby is less grainy and coarse, better able to resolve complex passages	FCL copper twin axial	R	59
Audioquest Livewire Topaz £35	Good Average	Sounding 'bigger' and faintly richer than Reference 2, Topaz was also slightly grainy at the top end	Gold-plated plugs, OFHC copper		59
Chord Mono-t £277/1.2m	Average + Average +	Offers a slightly rolled-off treble but its rich sound is an upgrade from patch-cords	Unsymmetrical 4-conductor cable	R	83 Supp.
Deltec Gortex Black Slink £152	Very Good Excellent	A true reference quality cable providing an exceptionally detailed and transparent sound	Symmetrical, 8-conductors, Gore-tex ins.	R	83 Supp.
Deltec Slink £32	Good Very Good	Ideally used in lengths of under 4 metres, it errs on the lean side of neutral but has an uncommon transparency in the midrange	4 silver plated OFC strands PTFE dielectric	BB	59
Kimber Kable KC-1 £65.55	Very Good Average	Tonally faintly leaner and brighter than the more open-weave PSB, KC-1's treble detail was just too sharp and grainy	Multi-gauge PTFE dielectric		59
Kimber Kable PSB £41.40	Very Good Very Good	An exceedingly transparent midband but slightly 'clanky' treble. It always managed to sound remarkably uncluttered and open	OFC, PTFE dielectric	BB	59
Monster Interlink 300 £30	Average + Average	A big, larger-than-life sound but with some emphasis of midband detail and loss of bass	Screened, symmetrical cable		83 Supp.
Monster Interlink 400 £50	Good Good	Bass is solid and punchy, counterpointed by a slightly overblown midband which tends to make vocalists sound larger-than-life	Multi-gauge	R	59
Origin Live Soli-Core Super £60	Good Average	Improves over previous Soli-core samples in stereo depth and bass weight, but a 'loud' treble presentation remains	Solid-core gold-plated AT plugs		59
QED Incon Graphite P1G Gold £19.95	Average Average	A shielded version of Incon P1, it sounded thicker at the frequency extremes, the top end being coarser and more out of focus. Good for long runs though	OFHC Graphite shielding	R	59
QED Incon P1-Gold £16.95	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
Supra EFF-1 £60/0.75m	Average Average	A new, costly and mildly disappointing addition to the range. Edgy, smeared sound	Screened, symmetrical dir. cable		83 Supp.
van den Hul MC-Gold £230	Average Good	It possesses a rich and beguiling treble balance that matches a weighty, slightly warm bass character. Seductive balance may prove worthwhile in some circumstances	Silver & gold plated copper		59
van den Hul MC-Silver £750	Good Good	Although remarkably transparent for an asymmetric design this costly cable was not considered to be of 'state-of-the-art' standard, and is bettered by cheaper models	19 silver plated copper strands		59
van den Hul MCD-102 III £61.50	Good Good	Possessing the same endearing qualities as the D300, it presented open and transparent soundstages and improved timbral resolution	Twin axial silver plated copper	R	59
van den Hul Thunderline £92	Good Average	Thunderline essentially parallels the sonic performance of the cheaper D102. HF is occasionally tainted by a 'tizzy' coarseness, bass is tight and dryscreening	Silver plated 'matched copper'		59

CABLES - LOUDSPEAKER

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Absolute Wire Force 4 £4.75 per metre	Good Average +	By current standards there was a loss of fine, sharp detail at the frequency extremes, but it has a big, friendly sound	744 OFC strands, PVC dielectric		64
Audio Innovations OR-200 £16 per metre	Average + Average +	Open and detailed throughout the midband but a grainy coloration tended to corrupt subtle timbral information at very high frequencies	200 LC strands, polyurethane and cotton dielectric		64
Audio Note AN-SP £100 per metre	Average - Excellent	A clean and open sounding cable that offered a deep and pleasantly detailed perspective. Bass was slightly restricted, but seemed tight and coherent	15 silver strands, polyethylene dielectric		64
Audio-Technica AT-6120 £10 per metre	Average + Average	Compared to earlier LC-OFC cables, this PC-OCC derivative sounded smoother and less aggressive	PC-OCC, PVC dielectric		64
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
Cyrus £2.50 per metre	Average + Good	Because of its impedance characteristic this cable will deliver a smooth and unfatiguing treble balance with loudspeakers offering an easy load	0.8mm single strand, PVC dielectric	BB	64
Deltec 8S £144 - 5m pair	Good Good +	The unerring transparency and detail resolution of 8S throughout the midband makes it a cleaner and more spacious sounding cable than others at the price	4 silver plated OF copper strands, PTFE	R	64
Deltec Gortex Black 16 £528 - 4.5m pair	Very Good Excellent	Improvements in bass resolution, transparency and treble poise maintains status of this cable	Silver-plated OF copper with Gore-tex ins.	R	83 Supp.

CABLES - LOUDSPEAKER

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Exposure £2.50 per metre	Good Good	It could sound a trifle matter of fact but this emotive flattening was also somewhat dependent on the music program. It is also highly suited to long runs	56 OFC strands, webbed PVC dielectric	R	64
Furukawa FS-2F09 £3.50 per metre	Good Average +	Some loss of bass weight but otherwise offers a fresh and open sound. Good value	Multi PC-OCC stranding, PVC dielectric	R	83 Supp.
Furukawa FS-2T15S £50 per metre	Good + Very Good	An advanced solid-core cable with a highly fluid, detailed and inherently musical sound	Single 1.5mm Super PC-OCC	R	83 Supp.
Kimber 4VS £7.15 per metre	Average + Average	Similar construction to 4TC but dissimilar materials infer a slightly tizzy sound	Open-weave, multistrand, PVC ins.		83 Supp.
Kimber Kable 4PR £54 - 5m pair	Average Average +	This directionally marked cable benefited from an open and airy treble quality but seemed notably leaner than 4TC. Bass was well round and satisfyingly taut	4 x 7 copper strands per conductor, PVC diel.		64
Kimber Kable 4TC £17.65 per metre	Good Good +	4TC made a great impression in the listening tests with an open midband, a smooth and unfatiguing treble with slightly rich but suitably weighty bass	OF copper, PTFE dielectric	R	64
Linn K20 £2.95 per metre	Good Average	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
Monitor PC Silverline PC4 £5.75 per metre	Good Average	Sonically, it laboured under a heavy and claustrophobic balance, lacking the see through transparency and lucidity of the better solid core cables	2072 x 0.07mm silver plated copper strands		64
Monster Original £3.49 per metre	Good Average +	Original sounded relatively congested and murky at higher frequencies but possessed weight and conviction in the bass	Multistrand		64
Monster SCI 16-4 £3 per metre	Average Average	Not as thick-sounding as early Monster cables but still slightly unbalanced. Versatile construction	4 x 16-gauge conductors, OFC strands		83 Supp.
NVA LS1 £6 per metre	Average + Good	A light and breezy sounding cable best suited to short lengths, NVA benefited from a clear and transparent outlook	7 x 0.25mm silver alloy strands, PTFE	R	64
QED 79-Strand £1 per metre	Good Average	For much of the last decade QED 79-Strand has been the first port of call for enthusiasts on the upgrading ladder, a tradition that should still hold true today	79 strand, PVC dielectric	R	64
QED Flat 200 £2.20 per metre	Good Good	I detected a degree of confusion at low frequencies but this did not stifle the acoustic atmosphere which remained open and positive	200 strands, flat webbed PVC dielectric	R	64
QED Incon Graphite £2 per metre	Average + Average +	This graphite version of Incon sounded cruder and generally more heavy handed than the cheaper unshielded type. Overall presentation was mildly restricted and cloaked in a faint aural fog	OFHC, polymeric screen		64
Rotel Supra 10 £8.95 per metre	Good + Good	Supra 10 provided a very free and open sound that was unhindered by any excess at low frequencies. Worth its weight in scrap copper!	2,562 OFC strands, webbed PVC dielectric	R	64
Rotel Supra 4 £3 per metre	Good + Good	Ideal for both long and short runs, it furnishes a big sound that benefits further from a smooth, unfatiguing treble	1,036 OFC strands, webbed PVC dielectric	R	64
van den Hul CS-122 £6.50 per metre	Average + Good -	Characterised by a driving and powerful bass, CS-122 is a heavy sounding cable. Mid treble detail was refreshingly clear but there was a slightly muted air about the extreme treble	19 x 0.45mm silver plated strands, rubberised dielectric	R	64
van den Hul D-352 £12 per metre	Good Average +	Subjectively it sounded like CS-122 only more so, the deep rumbling bass tending to overwhelm subtle musical details. It also appeared a trifle peaky in the treble	7 x 0.76mm + 168 x 0.125mm silver plated strands, rubberised diel.		64
van den Hul SCS-12 £10 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

Get wired!

For more information on interconnect cables please refer to the supplement attached to the cover of this issue. This free pocket guide contains reviews of nearly 60 interconnects and covers the latest offerings in both the analogue and digital domain as well as offering detailed advice about choosing and using both types of interconnect.

If you are considering buying loudspeaker cables then you'll have to wait until next month when we are continuing the *Hi-Fi Choice* pocket guide series with an issue dedicated to loudspeaker cables which we'll be giving away free with the August issue.

August issue on sale July 10th

CASSETTE DECKS

The bad odour of copyright theft hangs around the compact cassette, but there is no doubt it is the world's most versatile and ubiquitous music storage medium. Hi-fi buffs may wrinkle their noses pointedly, but are still happy to use cassette decks to make up tapes for the car or personal – at the same time complaining loudly about the quality of pre-recorded material. (In fact the very best decks can do a surprisingly good job with musicassettes.)

There is no problem in connecting a cassette deck to any normal amplifier, but some care needs to be taken in choosing the best tapes for a

specific machine. (Trial and error is one effective technique, but many decks have manual bias adjustment and some match up to the tape automatically.)

Lab performance and sound quality often go hand in hand, and are frequently somewhat dependent upon factory alignment. The mechanical integrity of the mechanism itself is another crucial factor, that is often reflected in the asking price.

All modern hi-fi decks have Dolby B and the majority have Dolby C besides; the very worthwhile HX Pro system is becoming steadily

more widespread. Remote control remains rare, though sometimes it is available as a system option.

Three-head recorders allow simultaneous checking of the recording being made. Auto-reverse is a useful convenience feature, but usually with some mechanical compromise, while double-mechanism 'dubbing' decks of dubious quality are fashionable at the bottom end of the market. The welter of different 'music search' systems available is some indication of their frequent ineffectiveness.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Acoustic Research RD-06 £300	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-F410 £100	Average Average	Comparable to AD-F500 but cheaper: Good all round performance, well adjusted, useful basic and not so basic features	2 head, Dolby B/C/HX Pro, bias adjust	BB	99
Aiwa AD-F500 £160	Average Good	Noise levels are a little higher than usual, but sound quality is otherwise very good - open, explicit and very neutral tonally.	Dolby B/C/HX Pro, cue/review, fine bias, record sensitivity adjust	R	93
Aiwa AD-F810 £200	Good Good	First class budget 3-head machine with a dual capstan transport that really works at reducing the 'fudge' factor	Dolby B, C, HX Pro, bias adjust, track search, variable hdpd	BB	99
Aiwa AD-WX616 £160	Poor Poor	Sonically sub-standard twin transport deck which has sensible range of well implemented features, yet which sounds compressed and uneven.	Twin full logic, 1 records, Dolby B/C track search	R	93
Aiwa AD-WX777 £190	Very Good Very Good	Excellent, middle price dual deck with quick side change and a living, breathing sound though prerecorded tapes sound bright	Twin auto-reverse, one records. Dolby B/C, fine bias	BB	75
Aiwa AD-WX888 £260	Good Good	Inaccurate set-up spoils metal tape operation, but with other tapes the deck works well. This deck offers fine engineering, facilities and sound	Dual auto-reverse twin deck, Dolby B, C and HX Pro	R	75
Aiwa XK-S9000 £700	Good + Excellent	Genuine state of the art in battleship pale gold/wood gloss clothes. Fabulous build, clunky transport and sharp, refined sound quality with Dolby S or B and metal tapes	Dolby B/C/S/HX Pro, built in DAC, R tape alignment	R	105
Akai DX-57 £200	Good Good	Confident sounding deck which eschews fancy gadgets for a good transport and decent electronics. Sound quality is firm and tidy under most conditions of use; avoid Dolby C	3 heads, dual capstans, Dolby B/C/HX Pro, variable bias		105
Akai GX-32 £170	Average Poor	Constrained sum up this deck well. It has poor bass and treble definition alike, though it proved well aligned for prerecorded cassettes	Dolby B/C, variable bias, headphone out, track search		69
Akai GX-52 £250	Very Good Very Good	Well finished and a pleasure to use, this well specified deck sounds clean and defined with all tape groups, with or without Dolby	Dolby B, C, HX Pro, track locate features	BB	57
Akai GX-65 £300	Average Average	Fine ungimmicky middle ranking deck with simple, purposeful controls, works best with metal tapes. Performance standards fair to good	3-head, dual capstan, Dolby C/HX Pro		87
Akai GX-95II £400	Good Very Good	Sharp, clear and articulate sounding deck, with superb performance extending to frequency extremes	3 heads, dual capstans, tape calibration, Dolby B/C/HX Pro	R	99
Akai GX-R35 £200	Average Average	Middling sound quality at best with Dolby B; deteriorates with Dolby C and unsatisfactory anyway with testing material due to loss of low level information	Auto-reverse (optically triggered), Dolby B/C/HX Pro, bias adjust		99
Denon DR-750A £250	Average Average	Workmanlike and simply equipped dual deck which is more appealing on audio grounds than most of its type	Dual transport, Dolby B, C & HX Pro	R	99
Denon DRM-510 £140	Good Average+	An amnesic Dolby switch and lack of timer standby detract from an otherwise strikingly successful deck with a consistently good performance	2 heads, Dolby B/C/HX Pro heads, record return	R	99
Denon DRM-710 £230	Average Average	Although this is a fair performing model, the design has lost some of the competitive edge of its predecessor, the DRM-700. Memo: must try harder - and where's the timer standby?	Dolby B/C/HX Pro, fine bias adjust, record return		105
Denon DRS-810 £300	Poor Average	Basically good deck with non-stressful material let down by an inability to deal with high energy tapes properly. The horizontal loading mechanism is a success.	CD style loading drawer, real time remaining display, Dolby B/C/		105
Denon DRW-650 £200	Average Average	This simply equipped model is a little fiddly to operate at time, partly because of the way the single set of transport keys is assigned. But sound quality is generally workmanlike - good value	Twin transport, Dolby B/C/HX Pro	R	93
Dual CC800RS £150	Average - Average -	Low(ish) cost auto-reverse deck has mic input but lacks some niceties. Delivers a punchy but ultimately rather crude impersonation of source material, and a thin, lightweight bass.	Auto reverse, Dolby B, C, HX Pro, microphone input.		105
JVC TD-R431 £170	Poor Poor	Modestly specified auto-reverse cassette deck which suffers the usual problems of the breed, to wit unstable, homogenised sound quality	2-head, Dolby B/C/HX Pro, auto reverse		99
JVC TD-R441 £170	Average - Poor	This deck would make a good choice for those who need the unattended recording time to deal with absentee recording off air, but is a less than wholly convincing musical advocate.	Auto reverse transport, Dolby B/C/HX Pro, CD direct input		105
JVC TD-V531 £260	Average Average	A simple but potentially Good deck with an excellent transport, let down by poor setting up. With all tapes, sound quality was thin and lacking in both substance and colour	3 heads, dual capstans, Dolby B/C/HX Pro, var bias		99
JVC TD-V541 £280	Very Good Very Good	Crisp, lively sounding deck with excellent timing and occasionally slightly thin tonal quality. Best with metals and Dolby B	Dolby B/C/HX Pro, 3 heads, fine bias, display off	BB	105
Kenwood KX-5030 £200	Good Average	confusing mishmash of listening impressions caused by poor set-up afflicting metal tapes and Dolby C in particular. Promising otherwise	2 head, Dolby B/C/HX Pro, auto-bias, track search		99
Kenwood KX-5530 £190	Average - Average -	Neat looking and well equipped deck, adequately engineered but somewhat lacking musically. Worth considering if auto-reverse is the key to your happiness.	Dolby B/C/HX Pro, auto reverse, auto biasing, auto fader		105
Kenwood KX-7030 £260	Good Good	Fine, articulate middle price cassette deck whose only (mild) failing with some programme material is a just perceptibly synthetic glaze	3 heads, dual capstans, Dolby B/C/HX Pro, auto bias	R	99
Marantz CP230 £330	Average Average	This is a competitively priced portable recorder though not suited to replay of musicassettes	Dolby B, bias adjust	R	52
Marantz CP430 £400	Average Average	Uniquely flexible and compact package for outside work which at a pinch can double as a domestic cassette deck. dbx is useful for location work; results with Dolby B are acceptable	Portable 3 head, dbx, fine bias, charger/adaptor	R	87
Marantz SD315 £180	Average Average	Sound quality is promising, but somewhat offset by 'shut in' top end. Pitch integrity suspect. Dolby C sound quality and dubbing performance poor	Dolby B/C/HX Pro, twin transports, one rec/play, one play only. Mic i		93
Marantz SD40 £150	Average Very poor	Obstructive aesthetics are offset by apparently good build and sensible features, but sound quality is uneven or worse.	Dolby B/C/HX Pro, fine bias	R	93
Marantz SD50 £230	Good Very Good	Fine, exacting all-rounder offering good stereo, precision and focus. Good with prerecorded tapes too.	Dolby B/C/HX Pro, track & intro search, variable bias etc	R	81
Marantz SD515 £350	Poor Poor +	Good electronic design is let down by mediocre alignment and poor transport stability. Disappointing at the price.	Twin auto-reverse, both transports record, HX Pro, parallel recording		93
Marantz SD60 £350	Good Very Good	A first rate, highly capable deck offering energetic yet refined sound largely due to good electronic design	3-head, Dolby B/C/HX Pro, variable bias & sensitivity	R	81

The Directory

CASSETTE DECKS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Memorex SCT-5 £150	Poor Poor	Poor example of a twin cassette deck where everything has been sacrificed on the altar of flexibility	1 rec/play, 1 play only transport, Dolby B/C		87
Nakamichi Cassette Deck One £700	Good Good	New modernised Nakamichi is still curiously old fashioned in many ways, but offers unusually articulate sound of great insight	Dolby B/C, 3 heads, dual capstans, var azimuth	R	99
Nakamichi Cassette Deck 1.5 £500	Good Very Good	High grade 3 head deck with minimal features but fine engineering and sweet, open though slightly coloured sound quality.	Dolby B/C 3 heads, bias adjust	R	105
Nakamichi Cassette Deck Two £350	Very Good Very Good	Not completely neutral, this deck is assured, dynamic and quick, with abundant detail and some coarseness. Stable transport but rudimentary features accompany fine under the skin engineering	Dolby B/C, manual tape type selection, bias adjust	R	93
Nakamichi RX-202E £600	Good Very Good	Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control	Auto reverse, Dolby B, C, 2 head	R	63
Philips FC870 £250	Average Average	Disappointing at the price, this is a well equipped deck with off-tape monitoring, but a somewhat listless, smeared musical style	Dolby B/C/HX Pro, 3-heads, track/intro search etc		81
Pioneer CT-339 £150	Average + Average	Auto BLE tape alignment is the most interesting feature. Sound quality is a little flaky, but reasonable, though pitch problems were encountered with cheap tape stock.	Auto tape align, Dolby B/C/HX Pro, mic inputs	R	105
Pioneer CT-676 £250	Average Poor	Dull, compressed and hard sounding deck, which is hamstrung by high measured transport flutter. Good points include sophisticated (and accurate) tape alignment	Dolby B/C/HX Pro, auto tape alignment, 3 heads		99
Pioneer CT-900S £500	Good Average	High spec and well built derivative of CT-93, but disappointingly lacklustre sound	Dolby B/C/S/HX Pro, dual capstans, 3 heads, auto alignment		99
Pioneer CT-93 £800	Excellent Excellent	State of the art deck, built like something out of NASA's shuttle, with superb all round performance. Dolby S can muddle ambient information, but increases effective dynamic range	Dolby B/C/S/HX Pro, auto tape align, 3 heads, dual capstans	R	99
Pioneer CT-W650R £200	Average Average	There were some intermittent problems with the tape alignment system on the test sample, but the deck was otherwise good, despite a coloured bass and inability to exploit Type IV tape	Twin deck, both reverse, one records, auto align, B/C/HX Pro	R	105
Revox B215 £1727	Very Good Very Good	Fine, consistent and solid sound quality, with excellent under the skin engineering and many useful features — but you're also paying for the same	Dolby C/HX Pro, 3 heads, dual capstans, auto tape align	R	87
Revox B215-S £1826	Very Good Very Good	This is a superbly engineered deck with a classically fine performance that almost transcends the stereotypes. Ergonomics are flawed but the user interface is both powerful and flexible	3-head, dual capstan, Dolby B/C/HX Pro, auto calibration	R	75
Revox H1 £1,145	Very good Very good	Bare bones version of B215 is still a sophisticated piece of kit, and lacks for none of the 215's engineering prowess	3 heads, Dolby B/C, auto tape align, semi-auto record level set.		99
Revox H11 £938	Average + Average +	Costly and well engineered deck which boasts the bare minimum of facilities and which is primarily designed for the Revox multi-room H-Line system. Moderate performance.	3 head, Dolby B/C/HX Pro, manual tape alignment		105
Sansui D-X111E £120	Poor Poor-	Very high levels of flutter, and a shabby, hollow sound with metallic colorations and a severe loss of detail - is it necessary to go on?	Dolby B/C/HX Pro, fine bias adjust		105
Sansui D-X211HXR £170	Good Good+	Clean, stable and open sounding recording quality distinguishes this player, - and auto-reverse too. A great improvement on earlier mid price Sansui models, and excellent value.	Auto reverse, Dolby B/C/HX Pro, bias adjust	BB	93
Sansui D-X311WR £250	Poor Poor+	Not wholly successful auto-reverse deck which suffers because it has tried to be all things to all people. Lack of clarity is the main limitation	Twin optically triggered auto-reverse, Dolby B, C & HX Pro		99
Sony K870ES £350	Average+ Average+	Good but not outstanding deck which proved slightly disappointing on audition. This model is no standard setter	3 heads, dual capstan transport, Dolby B/C/HX Pro, tape calibration		99
Sony TC-K520 £170	Average Good	Fine, assured and detailed performer with a very well designed and straightforward user interface	Dolby C/HX Pro, variable bias, display on/off	BB	87
Sony TC-K570 £200	Good Average+	Good if slightly untransparent sounding recorder, comfortable with all noise reduction circuits and all tape groups	3 heads, Dolby B/C/HX Pro, bias adjust	R	99
Teac V-5000 £300	Average+ Good-	Fine middle ranking heavyweight with blemish free overall performance, beaten only on subtleties by the best at the price	3 heads, dual capstans, bias/sensitivity adjust, Dolby B/C/HX Pr		99
Teac V-7000 £400	Good Good	Intrinsically sharp, clear and solid sound spoiled by exaggerated detail with prerecorded material and losses imposed by Dolby circuits	3 heads, quartz locked dual capstans, tape align, Dolby B/C/HX		99
Teac R-9000 £450	Good + Good	Much better than average auto-reverse deck, well worth considering, though short of the special qualities required for formal endorsement at this price. Nicely engineered too.	Auto-reverse, 3-head, tape calibration, Dolby B. C, HX Pro		105
Teac V-8000S £700	Good + Excellent	Superb stability and real subtlety from a cassette deck, this must be the best Teac yet. The only disappointment was the Dolby C circuit which was coloured and lacking in transparency.	3 heads, dual capstans, Dolby B/C/S/HX Pro, tape calibration	R	105
Technics RS-B965 £380	Very Good Very Good	Messy control layout, but ultra capable deck with clear electronics and excellent headroom, low noise, an ultra-stable transport - and first rate sound quality.	3 head, dual capstan, Dolby B/C/HX Pro, dbx, assisted tape alignment	R	93
Technics RS-BX606 £180	Average + Average +	Good middle ranker with accomplished metal tape handling but some HF roughness. Good with both noise reduction systems and with prerecorded material.	Dolby B/C/HX Pro, 3 heads, variable bias	R	105
Technics RS-BX707 £220	Average Average -	Uneven but ultimately messy sounding deck with a number of oddities, including a tape calibration system lacking in accuracy and poor Dolby alignment	3 heads, Dolby B/C/HX Pro, bias & level calibration		105
Yamaha KX-250 £150	Good Good	Excellent if somewhat fiddly deck with all mod cons. Play trim helps bring recalcitrant tapes back into line. Refined, expressive sound quality and stable transport	Dolby B/C/HX Pro, Intro Scan, Play Trim	BB	93
Yamaha KX-330 £180	Average Good	Cramped control panel but a strong, dynamic and comparatively stable performance distinguish this strong middle-price deck	Dolby C/HX Pro, optional remote control	R	87
Yamaha KX-530 £230	Good Good	Excellent all-rounder that does most things at least competently and many things well. One of the best middle price decks	Dolby C/HX Pro, 3 motors, optional remote control	BB	87
Yamaha KX-650 £300	Average+ Good	Fine audio manners, especially in the midband and treble, mark this high class deck out from the crowd	3 heads, dual capstans, Dolby B/C/HX Pro, play trim, bias adjust	R	99
Yamaha KX-930 £400	Good Average	Worthy but ultimately slightly disappointing mixture of fussy ergonomics and tidy but cluttered sonics	3 heads, dual capstans, Dolby C/HX Pro, remote control		87

CD PLAYERS

Now nearly a decade old, this all digital music source is well established despite high disc prices and the opposition of many hi-fi enthusiasts. Compact Disc's strengths over conventional vinyl are complete freedom from surface noise, ease of use, and more robust software. Remote control is just about standard on all new players.

However, many vinyl enthusiasts find CDs

*sound less involving than top quality vinyl.

Prices average out at a little over £200, although entry level models are now available for little more than £100. Even the most basic models can sound very good indeed and employ state of the art decoding chips and the most useful play features. Extra money can buy remote volume control, audio 'tweaks', plus improved build and component quality control.

Digital outputs facilitate an easy upgrade path.

Machines can be split into bitstream and multi-bit with each school having its adherents. Bitstream is the newer technology and will probably win in the end, although the development time spent on multi-bit systems means that excellent results can still be obtained.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Acoustic Research CD-06SE £450	Average- Average-	Basic Philips machine with beefed-up chassis and a revised analogue board. Distortion is higher than normal while the sound lacks both immediacy and clarity.	Remote control, programming but no direct track access, 16bit 4x		95

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CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Acoustic Research CD-07 £300	Good Good	AR's first Bit Stream CD player relies heavily on Rotel know-how to produce a smooth, detailed but undemanding sound	Few features on player, remote, dig o/p. SAA7321 PDM DAC	R	100
Aiwa XC-300 £130	Average + Average +	Cheap, cheerful and gratifyingly free of digital 'nasties', this new bitstreamer is well-equipped but safe rather than thrilling on the sonic front.	Remote control, optical output, Toshiba bitstream DAC.	R	107
Aiwa XC-700 £180	Good+ Very Good	Generously equipped player that harbours a top Philips' Bit Stream DAC. Offers a characteristically smooth and effortless 'bitstream sound'. Exceptional value	Remote control plus index skip, midship transport and 7350 PDM DAC	BB	95
Aiwa XC-900 £210	Good + Good -	The loss of transparency and general awkwardness of this player comes as a surprise after the XC-700. Extra features have taken their toll	Remote control with variable o/p, midship transport, 7350 PDM DAC	R	100
Akai CD-52 £249	Good Good	A nice surprise from Akai, genuinely good sound from this mid-priced model. Better linearity will help further	Remote, digital output, headphone socket	BB	64
Akai CD-55 £230	Good Average -	Budget model which fails to compare with the CD52	Remote, hdph, Good programming		83
Akai CD-57 £180	Average + Average +	A very flexible machine with a slightly lumpy but fullsome bass, no model of clarity but very entertaining!	Remote control, motorised volume, hybrid PWM DAC	R	107
Akai CD-62 £330	Average Very Good	Looks, build quality and the technical specification are right up to date. As it stands it sounds ve good but if the indifferent lab performance is improved, it would probably sound even better	Remote, programme, hdph, comprehensive display etc	BB	70
Akai CD-73 £450	Good Average	A little uneven musically, the Akai tends to smother fine detail, but has first class dynamics and stereo imagery. Worth auditioning	Track entry keypad remote, menu display (switchable)		62
Akai CD-93 £700	Good Very Good	Undoubtedly a CD player of real class in build, presentation, lab performance and sound quality, but also a shade expensive for formal Recommendation though that's not to dissuade lovers of	Track entry remote, menu display etc.		58
Arcam Alpha £420	Very Good Very Good	Arcam's new star, its best CD player yet and great value	Remote, etc, coax dig. out	BB	83
Arcam Delta 70.3 £650	Good Good+	Latest in a line of Delta 70 CD players and one that offers a distinctly rugged, beefy sound. Plenty of power behind individual instruments but lacks a feeling of involvement	Remote control, display dimmer, variable and dig outputs. 7350 PDM		95
Ariston CD1 £400	Good Good	Easy on the ear compact disc for those who like their music Radio 2 flavoured. And it looks good	digital output, remote control	R	87
Ariston Maxim CD2 £550	Good+ Good+	Yet another re-worked Philips player with chunky alloy casework and sophisticated analogue stage. Narrowly escaped a recommendation with its dynamic and purposeful sound. Still a hint	Remote control, coax digital output. 16bit 4x chipset.		95
Ariston Maxim CD3 £430	Good Good	CD1 electronics given room to breathe in the heavyweight CD2 chassis. The result? A fine all-rounder with a positive, dynamic sound that's better than either parent.	Remote control, display-off facility, Philips 16-bit chipset.	R	107
CEC 880CD £230	Poor Average	The dynamic and spritely sound of this machine is gratifying in the light of its primitive design but is otherwise poor value	Remote control, direct track access, dig o/p, hybrid PWM DAC		100
Cambridge Audio CD3 £649	Poor Good +	Unique internal configuration gives the CD3 a fluid and detailed sound falling off at the frequency extremes. The controls and displays are primitive	Optical/electrical digital out, remote control		87
Carver TL-3220 £495	Good Average	A lightweight player with primitive display. We thought it sounded rather sparse and dry, and though Carver's DTL feature certainly fleshed-out the bass it also softened the stereo focus	Remote control with volume keys, 'Digital Time Lens', 18bit 8x		95
Carver TL-3300 £595	Good + Poor	Carver needs to listen critically to CD sounds; in our opinion, DTL does not improve the recipe	DTL, remote, programming, digital output		83
Cary Audio Design CAD-955 £899	Average Average +	Rotel's latest 16-bit wonder with an add-on valve processor to filter-out any residual RF garbage. Nice idea but the player sounds very dry and taut, lacking warmth and body.	Remote control, triode-output stage, Philips 16-bit chipset.		107
Creek CD60 £500	Good + Good	A big and confident sound from a player that's stuck with a green display, green lettering and green-fronted drawer. So it looks ghastly even if the internal design is very thoughtful.	Remote, spring-loaded buttons, coaxial digital output, 16-bit.		107
Denon DCD-1290 £319	Good Good -	This player certainly looks the business but its sound is a real five-minute wonder. Its compelling fizz lasts about as long as your average firework.	Remote, pitch control, index skip, variable output, 18-bit		107
Denon DCD-1460 £400	Good+ Average+	Here's a player that benefits from solid casework and decent features yet the overly complex electronics knock the stuffing from its sound	Remote control, volume, index search. 18+2-bit DACs		100
Denon DCD-2560 £550	Very Good Good	Beautifully built and, once again, generously equipped yet with a sound that's decidedly sluggish or reserved, particularly through the bass. Vocals are more forward but can sound a little glassy	Remote, pitch, tape edit features, opt/coax digital output, 20bit 16		95
Denon DCD-860 £250	Average+ Good+	This is a well designed and generously equipped budget player that offers a very spacious and appealing sound. There's a hint of treble emphasis but it still sounds great at high volumes!	Remote, pitch and full tape edit facilities. 18bit 8x.	R	95
Denon DCD-960 £300	Good + Average	A fine feature package with good lab results, but unfortunately an unexceptional sound quality	Remote inc vol, hdph, keypad, well featured		88
Dual CD1080RC £200	Very Good Average -	A rather strange-sounding player with a top-heavy treble that does little to redress its lack of vibrancy and emotion. The back-lit LC display and clean digital output are plus points.	Remote, coaxial digital output, digital volume, MASH/PWM DAC.		107

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CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Ferguson CD007 £130	Good Average	The cheapest recommendation in the test group; don't expect the earth but the value is good	Manual, digital output, headphone socket	R	64
Ferguson CD008 £150	Average Average	Not as strong as its relatives, sample fault perhaps? Though performance is fair enough overall	Remote, midi digital output, 2x O/s, timeshare 16 bit	R	64
Goodmans GCD-435 £140	Poor Average -	Goodmans has the power to source with more care than this, music centre quality!	multibit, remote, basic facilities		88
Harman Kardon HD7450 £230	Poor Average +	This player looks little different to other HKs but its performance is dominated by a budget decoder/oversampling IC. Good bass nonetheless but pop tracks can sound fizzy and tiring.	Remote control, display-off, timed-shared mono 18-bit DAC		107
Harman Kardon HD7450 £300	Good Average	A very stylish machine but one that is let down by its aggressive and 'dirty' treble quality which pierces through most types of music. Weak bass resolution undermines the 'roots' of the player	Remote control but no headphone socket. MASH/PWM bitstream		95
Harman Kardon HD7500II £350	Good+ Good+	An update of the original HD7500 but featuring superior analogue electronics to the HD7450. Tonal integration is much improved, packed with detail that's expressed with enthusiasm.	Remote, variable, digital and headphone outputs. MASH/PWM	R	95
Harman Kardon HD7600II £429	Good+ Average+	Based on the HD7500II but with a motorised volume control and extra-heavy casework. Either way it lacks the transparency and sparkle of the cheaper machine	Remote, variable and digital outputs. MASH/PWM DAC		100
Harman Kardon HK7300 £200	Average Average -	Budget low bit technology, does not deliver enough for a recommendation	No remote, no digital out; basic control features		83
JVC XL-V231 £149	Excellent Average -	Text book lab result but below par sound, nice and boring. Must be some potential here	Remote, hdph (fixed), JVC 1-bit PFM		88
JVC XL-V241 £160	Good Average	Even with its mkII PEM DAC this new machine sounds pleasant but not especially interesting. Stereo imaging is a trifle suspect	Remote control, slim centralised drawer, PEM bitstream DAC		100
JVC XL-Z1011 £520	Very Good Good+	JVC's current flagship combines old K2 technology with PEM bitstream to deliver a full, beefy and engagingly dynamic sound	Remote control, variable and digital outputs, PEM bitstream	R	100
JVC XL-Z431 £200	Very Good Average-	This is a player that started life off the back of the successful XL-V231 but whose performance fails to come up to scratch. The sound is weak and uninspiring - poor use of JVC's PEM DAC.	Remote operation, motorised volume + tape edit. PEM bitstream		95
JVC XL-Z441 £200	Very Good Good	The smoothest-sounding of JVC's budget machines - clear and bold but also very even-handed. One if not their best sub-£500 players to date and strongly recommended.	Remote control, tape edit, index skip, PEM bitstream DAC	R	107
Kenwood DP-4030 £180	Good+ Good+	Kenwood's first and cheapest bitstream player enjoys a deceptively detailed and refined sound but one that is mildly veiled right across the spectrum. Excellent value nonetheless.	Remote, variable and opt digital outputs. NPC bitstream DAC	R	95
Kenwood DP-5030 £200	Good+ Good+	This looks like the DP-4030 but has more in common with the DP-7030 inside. Either way its neutral, uncluttered and intimately detailed sound is better than both	Remote control, motorised volume, R disc file. Sony PLM DAC.	R	100
Kenwood DP-5040 £200	Very Good Average	Better built and technically superior to the older DP-5030 but its untidy, detached treble quality proved a real disappointment in our listening tests.	Remote, display control, tape edit, peak search, Sony PLM DAC.		107
Kenwood DP-7030 £300	Good+ Good+	By adapting established Sony bitstream technology Kenwood has moulded its own exceptionally smooth and polite sound. Very nicely built machine with midship transport mechanism.	Remote, index scan, variable and optical outputs. Sony PLM bitstream	R	95
Kenwood DP-7040 £300	Very Good Good	A classy, polished sound from a decidedly refined piece of engineering. Close to the older DP-7030 in terms of performance but better value in construction and technology.	Remote control, Disc File memory, R display control, Sony PLM DAC.	R	107
Kenwood L-1000D £830	Very Good Good	A beautifully constructed and very stylish player that really only gives off its best when teamed-up in balanced-mode with Kenwood's matching pre/power combination	Remote control, balanced XLR's, 16-bit integrating DACs		100
Luxman D105u £699	Average Average	Visible valves are essentially for show in this rather ordinary player - both sound and lab	"valves", remote inc vol, hdph, well equipped		88
Marantz CD-42 £180	Average + Good +	Not as warm or rugged-sounding as the CD-52 but still wonderfully spacious and intimately detailed. Currently the best player under £200, plus it's got a decent coaxial digital output.	Remote control with direct track access, SAA7350 Bit Stream DAC	BB	107
Marantz CD-52 £200	Average+ Good+	Hardly the most neutral player on the planet but its rich, full and very generous sound cannot fail but warm the coldest of hearts	Remote control, FTS and dig outputs. SAA7350 PDM DAC	BB	100
Marantz CD-52SE £180	Average + Very Good	A similarly dramatic yet far more neutral sound than the basic CD-52. Either way, its engaging and believable performance was a real hit with our listeners.	Remote, FTS memory, switchable digital output, Bit Stream DAC	BB	107
Marantz CD-62 £300	Good Good-	Basically this is a Philips CD850II with Signetics op-amps all plonked into an old CD-50 chassis. Something of a range-filler	Remote control, index, 8-step volume and FTS. SAA7350 PDM DAC	R	100
Marantz CD-72 £400	Good - Good +	A heavily-constructed player based on the same digital electronics as the CD-42 and CD-52. This implementation sounds astonishingly solid and immediate but also rather too 'clean'.	Remote, variable and digital outputs, FTS, Bit Stream		107
Marantz CD-80 £560	Very Good Good	A dynamic and bold sound from a machine that is equally bold in appearance. It betrays no fear of the most thundering crescendos yet can sound a little hard or glassy with pop CD's	Remote, motorised volume + FTS programming, 16bit 4x.		95
Memorex CD1650 £200	Poor Poor	An overpriced music entre player. Surely the giant Tandy corp. can get a better standard than this?	remote, keypad, multi bit, midi		88
Meridian 206B £995	Excellent Excellent	What a stunner! Audiophile quality from the reference one box CD player, and at a most realistic price	Differential bitstream, keypad remote, prgming	R	88
Meridian 206B (DAC7) £971	Good + Very Good	Plenty of tight, strong bass but a little mechanical or even sparse at times. Its technical presentation of music is spot-on, only the sense of drama or anticipation needs working on.	Remote control, novel direct-loading transport, DAC7		107
Meridian 208 £1,550	Excellent Excellent	State of the art CD sound combined with a decent preamp and full remote control	Hdph + remote level. Programming, R phase invert, various outputs	R	83
Micro Seiki CD-M100 £5541	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
Micromega Logic £500	Good- Good	A rather expensive version of Philips CD624 with new op-amps and CD tray. Still, it does sound rather meatier, better integrated and more purposeful	Remote control, no FTS but switchable digital output, SAA7321 DAC		100
Mission DAD5 £300	Good Average +	Similar-sounding to Philips' 600-series players: lively, plenty of space and full of 'bounce' but a little too eager to impress in the short term.	Stylised remote, no 'stop' key on player, digital out, Bit Stream		107
Musical Fidelity CD1 £400	Average + Good -	Put together in Taiwan to MF's specifications, the main PCB and digital electronics are also used by Rotel's RCD-965B! This version lacks the creamy, engaging quality of the latter.	Simple remote, index and track skip, digital out, SAA7323 DAC		107
NAD 5425 £200	Very Good Very Good	Not much in the way of facilities on offer but a sound that is both wonderfully open, detailed and appealing. This is a very communicative player that sounds positive without being brash	Worthless remote control, track skip/scan. MASH/PWM bitstream DAC	BB	95
NAD 5440 £300	Very Good Good+	The 'no compromise' version of NAD's 5425 but still rather lacking in facilities. Its sound is smoother and richer than the 5425, preferring to seduce with subtlety rather than have	Remote with direct track access, variable output, MASH/PWM	R	95
Nakamichi CD Player 2 £625	Average+ Average+	This may look like a CD Player 4 but features a special transport able to store 7 CD's with one in play. Nevertheless its digital electronics are flawed and its sound powerful but blunt	Music bank, remote, volume control, digital o/p, 18 bit DACs		100
Nakamichi CD Player 4 £300	Average+ Good-	Attractively styled but suffers high-ish distortion for a modern CD player. Best suited to up-beat pop rather than complex classical works which seem to lack focus and secure soundstaging	Remote with track access, coax dig. output. 18bit 8x		95
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, I		51

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MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Nakamichi OMS-7EII £2000	Good + Good	The only serious criticism here is of the price. And in our opinion you can get better sound quality for less elsewhere in Nakamichi's range	10 digit track entry programming, hdph		51
Philips CD604 £130	Poor Average +	To all intents and purposes this slightly ponderous but weighty-sounding player is the older CD610mkII minus remote control. Good sound at a daft price	No remote, tape edit, peak search, digital out. 16-bit	R	107
Philips CD618 £170	Good Good	Cheapest of Philips bitstreamers and quite possibly the best with its excellent definition, punch and sparkle	Remote control, shuffle play, variable headphone, SAA7321 PDM	R	100
Philips CD624 £200	Good Good-	Philips' cheapest Bit Stream machine is still equipped with a vast array of features. Sounds pretty civilised too but lacks the crispness and freedom necessary to set it apart.	Remote, FTS programming, digital output. SAA7321 Bit Stream DAC		95
Philips CD634 £250	Good Good-	The all-singing all-dancing version of Philips' budget Bit Stream player and one that seems better able to cope with the pizzaz and dynamics of a decent recording. Nevertheless it	Remote, FTS + Title + personal programming SAA7321 Bit Stream		95
Philips CD850mkII £400	Very Good Good	This looks just like the original but sounds completely different, trading a little transparency and pizzaz for an altogether smoother but slightly less memorable performance	Remote control, 2 FTS, personal presets. SAA7350 Bit Stream DAC	R	100
Philips CDV185 £350	Average + Average	Hard to value with the video singles facility but it all works well enough for a recommendation	Video singles + CD scart + digital out etc	R	76
Pioneer PD-75 £800	Very Good Very Good	A confident yet beautifully poised and relaxing sound from an equally luxurious package. Oodles of refinement plus Pioneer's hi-tech Stable Platter transport, but still expensive.	Remote, index and track skip, display off, PDM Bit Stream DACs		107
Pioneer PD-7700 £250	Good+ Good+	A busy-looking player with an upside-down transport yet one that offers a very tight, confident and dynamic sound. Bubbly and entertaining but still very refined	Remote control, turntable drive mechanism. 1-bit PDM DAC	R	100
Pioneer PD-8700 £300	Good+ Very Good	A pair of PDM DACs builds upon the sound of the 7700, crafting a generous soundstage populated with big-hearted and thoroughly captivating musical images	As 7700 plus index skip, display off and motorised volume. 1-bit	BB	100
Pioneer PD-91 £900	Excellent Excellent	Close to state of the art in nearly all areas soundstaging, clarity and simple lack of artificiality. A well made and sophisticated player	Track entry remote, calendar display	R	64
Pioneer PD-93 £1430	Very Good Good+	The extremely civil, understated feel of its music contrasts markedly with the over-engineered construction of this unit. It will not offend anyone but then neither will it spark much excitement	Remote with fader and index facilities. Two dig o/p's. 20bit 8x		95
Proton AC-120 £180	Average Average -	Fine styling, low price but barely average performance	15 track memory, simple design, remote, hdph		76
Revox B126 £649	Very Good Good	Made in Switzerland so the build quality and technical performance is high, but then so is the price and the sound quality is only good	Programming, Revox system compatible		70
Revox B226S £840	Good Average	Top quality build and finish for the Revox system enthusiast. For high value sound look elsewhere	Remote vol, hdph, 19 track memory, digital op		76
Rotel RCD-955AX £260	Good + Average	Touted as a repackaged version of the evergreen RCD-855. In practice, however, our sample disappointed on several visits lacking the clean, cohesive quality of the original.	Remote control, digital output, repeat, scan, Philips 16-bit		107
Rotel RCD-965BX £300	Average+ Excellent	Two years on and the 865's replacement turns out to be an exceptionally refined bitstreamer: transparent, exquisitely detailed and powerfully emotive. A landmark player	Remote control, index skip, digital out. SAA7323 PDM DAC	BB	100
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	Remote (inc volume), skip, scan etc.		58
Sansui CD-X311mkII £250	Good+ Good	Sansui's mid-ranked player uses Technics' technology but provides a warm and cuddly sound that's atypical of the breed	Remote control, variable and digital out, MASH/PWM DAC	R	100
Sansui CD-X317 £300	Good + Average	Not in the same class as Sansui's older CD-X311mkII. Same technology and a similar appearance but the sound is neither as responsive or engaging	Remote, fixed, variable and digital outputs, MASH/PWM DAC		107
Sansui CD-X711 £600	Excellent Very Good	Luxury features, finish and sound from this classy Sansui; no excuses required here	Hdph + vol, remote full programming	R	83
Sharp DX150 £129	Average Average	This is one oversampled player which is rather outclassed for technical and sonic merit by the vast majority of the competition. Pretty enough but would you want to put discs in it?	Programmable, skip, search, repeat		70
Sharp DX750 £179	Average Average	It has a remote control but it's too like the 150 which is rather outclassed for technical and sonic merit by the vast majority of the competition	Remote, programmable, skip, search, repeat		70
Sony CDP-591 £160	Good+ Average+	Tons of features at a highly affordable price but let down by its lacklustre if inoffensive sound quality. The sound of these new Sony players lacks the grip and purpose of the last generation	Remote control, variable and optical digital out. PLM bitstream		100
Sony CDP-797 £200	Good + Good -	Another day, another DAC. This new budget player succeeds with its taut imaging, clean and impressive soundstaging. Can seem a little too lean or dry, however.	Remote, motorised volume, edit and scan facilities, PLM DAC	R	107
Sony CDP-991 £230	Good+ Average+	Another well-equipped and well-specified machine and one that can sound very up-beat and detailed with simple material. Tends to lose its way with complex stuff, however	Remote control, Custom File programming, variable out. PLM DAC		100
Sony CDP-X333ES £400	Very Good Good-	This beautifully built player has a very tidy and well-ordered style of music-making, but in the long run it lacks the ability both to excite and involve	Remote control, Custom File programming. Complementary PLM DAC		100
Sony CDP-X339ES £430	Excellent Very Good	Superbly constructed, this tour-de-force of features and technology offers a tightly detailed almost cavernous sense of acoustic. The mid and treble can sound positively magnetic.	Comprehensive remote, Custom/Edit Navigation System, new PLM DAC	R	107
Sony CDP-X77ES £1000	Excellent Good+	Rather like Pioneer's PD-93 this flagship player is beautifully put together but simply lacks the thrill or conviction of cheaper and perhaps more ragged-sounding machines. Still,	Remote, everything but Custom File titling. Complementary PLM		95
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 CD-P4500 £250	Good + Good	TEAC's first genuine 1-bit player uses Philips BS DAC to great effect, its sound described as having a certain 'organic warmth', very composed and easy-going.	Remote, pitch control, variable out. SAA7350 Bitstream	R	107
Technics SL-PG200A £160	Good+ Good+	This season's version of last season's favourite (the SL-P277A) offers extra features and a similarly punchy, dynamic and up-beat sound. All this plus an uncommon poise - Best Buy	Remote control, random play, variable out, MASH/PWM bitstream	BB	100
Technics SL-PG420A £160	Good + Good +	No repackaged version of the SL-PG200A but a new player in familiar clothes. Still offers an open, transparent and uncommonly fresh sound but a little of the 'magic' is missing.	Remote, digital volume, synchro edit, auto cue, MASH/PWM DAC	R	107
Technics SL-PG520A £200	Good + Very Good	A cracking player that builds upon the astonishing out-of-the-box sound of earlier budget players. Superb clarity and dynamics, thrilling but musically involving too.	Remote, shuttle search dial, edit mode, peak search, MASH/PWM DAC	BB	107
Technics SL-PS900 £350	Very Good Good-	Just about the quietest transport in existence and a sound that is equally unobtrusive, polite and refined. There's plenty of detail too but the overall result won't set your pulse racing	Huge remote control, function manager MASH/PWM DAC		100
Wadia WT-2000/Digimaster 2000 £	n/a Very Good	Very high grade player which provides state of the art in believable music making from CD, and promises a degree of upgradeability	Transport/multi bit DAC - 32, 44.1, 48kHz o/s		Coll '9
Woodside WS2 £1095	Good Good+	Prompted a mixed reaction on audition, responding well to our jazz and classical selection but sounding bright and grainy with the pop CD's. RF emission is very high	Remote control, display defeat, variable and digital outputs, 16bit		95
Yamaha CDX-450 £170	Average+ Good	A contentious player this and one that prompted a range of reactions from enthusiasm to disinterest among our listeners. It could prove too safe-sounding but worth a try at the price.	Remote control, track access, variable out. 18-bit hybrid DAC	R	100
Yamaha CDX-750 £250	Good Average+	A sleek machine that can sound rich and vibrant with simple material but seems to lack expressiveness and subtlety when dealing with busier, more complex passages	Remote control, variable and digital out, LC display. PDM DAC		100

CD TRANSPORTS AND DACS

A CD player can be split into two basic components, the mechanism which reads the information from the disc, known as the transport, and the device which turns the digital numbers contained on the disc into the music that comes out of your speakers, this device being referred to as a digital to analogue converter or DAC. Although at the lower end of the market both of these are contained in a single box, at the top end of the market two box machines consisting of a CD transport and a separate DAC become more common.

Although many of these units will be purchased as two box machines, which are generally considered to sound better than a one box equivalent, a DAC can also be used to upgrade an existing CD player. A good example is where an early machine with a satisfactory drive unit but a rather dated DAC can be brought up to the latest spec by the addition of a new DAC.

When upgrading an existing player best results are usually obtained using the electrical digital output rather than optical, and obviously

to be upgradeable your CD player must have a digital output in the first place

The choice of interconnect is crucial in linking drives and DACs and conventional interconnects used for analogue signals should be avoided, a dedicated 75ohm digital cable will give far better results.

Mixing and matching transports and DACs from different manufacturers can be a bit of a lottery and readers are referred to the full reviews where this subject is discussed in more detail.

CD TRANSPORTS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Arcam Delta 170.2 £620	Very Good Good	An upgraded Delta transport, it sounds different but not really better. More research is required here	Transport only, display off, usual programming		88
Kenwood DP-X9010 £500	Average Average +	Compromised by jitter, RF noise and poor clock selection this transport generally encourages a dynamic but bright and edgy sound with most DACs	CD transport, optical + coax outputs, Class 2		96
Marantz CD-95DR £1500	Very Good Good	At its best with Philips-based DACs, this transport sounds confident if not totally pure, sparkling or fresh	CD transport, optical + coax digital, Class 1		96
Meridian 200 £895	Very Good Very Good	Broadly compatible with most DACs and offering a light, fresh and very bubbly sound that is both natural, engaging and unfatiguing	CD transport, optical + coax outputs, Class 1	R	96
Meridian 602 £1,750	Very Good Good	This dedicated CD transport teams-up most successfully with the 606 DAC. Otherwise it lacks the life and pizzaz of the 200	CD transport, optical + coax outputs, Class 1		96
Philips CDD882 £500	Good Good	A butchered CD880 CD player-cum-CD transport that pairs up well with most Philips-based DACs. Dynamic and lively but can also sound a little mechanical	CD transport, optical + coax outputs, Class 1		96
TEAC P-10 £1499	Good Very Good	A chunkier and altogether more successful transport than the P-500 with an especially beefy and compelling sound. TEAC's best	CD transport, coax + optical outputs, Class 1	R	96
TEAC P-2 £2849	Very Good Good	TEAC's flagship CD transport is beautifully styled and constructed but its sound is bleached and generally less inspiring than that of the P-10	CD transport, coax + optical outputs, Class 1		96
TEAC P-500 £649	Good Good +	Provides a smooth and very sympathetic sound with most DACs yet is also rather vague, lacking the crispness and resolution of its peers	CD transport, coaxial and optical outputs, Class 2	R	96
Technics SL-PA10 £470	Good + Good	Built to partner the SU-MA10 upmarket integrated amp/DAC, this transport has the unusual limitation of only optical output. Reassuringly solid and more immune to vibration than most	CD transport, optical output only, remote		88
Wadia WT2000 £5614	Very Good Good +	Based on TEAC's P-2 with outboard mains transformers, active digital output and solid alloy casework. Dynamic and crisp sound best realised with Wadia DACs, otherwise less impressive	CD transport, AT&T opt +direct -coupled coax outputs, Class 1		96
Wadia WT3200 £1800	Excellent Very Good	Based on Marantz's CD-95DR with new casework, active digital output and revised grounding. Very clean, clear and authoritative sound with Wadia and Philips-based DACs	CD transport, AT&T opt + direct -coupled coax outputs, Class 1	R	96

DIGITAL TO ANALOGUE CONVERTORS (DACs)

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Arcam Black Box 2 £260	Very Good Very Good	An upgraded version of the old BB1 with more inputs and improved sound quality	Optical and wired inputs	BB	76
Arcam Black Box 3 £360	Good + Very Good	Top of a series of three decoders it can offer a high sonic standard with top class transports	Bitsream, auto input switching,	R	88
Audio Alchemy Digital Decoding Engine V1.0 £376 £3898	Good Very Good	A very sweet and seductive sounding unit that gives good results with a wide range of CD players/transports	Coaxial and optical inputs, phase invert, Bit Stream DAC	BB	101
Audio Research DAC1-20 £3898	Very Good Good	This expensive DAC works surprisingly well with Meridian's cheaper 200 transport, an impressively weighty and engaging combo that proved entertaining on audition.	BNC, Toslink and AT&T optical inputs, phase invert, 20-bit DACs		103
Audiolab 8000DAC £695	Very Good Good	Needs to be used with a genuine Class 1 digital drive. At its best with the Wadia WT3200 where it sounds vivid and alive. Otherwise can sound a little antiseptic.	Coax and opt inputs, phase invert, crystal lock, Bit Stream		103
Deltec Bigger Bit £650 + £98	Good Very Good	Partnered with either TEAC P-10 or Meridian 200 transports, the Bigger Bit delivers a very taut and dynamic sound, bathed in an open acoustic. Deltec's RF mains filter is a must.	Coax and opt. inputs, Deltran sync facility, DAC7 Bit Stream	R	103
Deltec Little Bit (Optical) £400	Very Good Good	Our sample suffered from radiated RF interference but new LB's are now cured. Works especially well with Meridian's 200 transport but does require the services of Deltec's 'Power' mains filter.	Coaxial and optical inputs, SAA7350 Bit Stream DAC		101
Deltec PDM1 £500	Average Very Good	A no frills audiophile bitstream converter at an affordable price	Coax-in, special cable and mains filter options	R	83
Deltec PDM1 Series 3 £1195 + £196	Very Good Good +	Hailed as a budget version of the PDM2, it bears technical comparison with both the PDM2 and Bigger Bit but - in terms of sound quality - is no great advance on its cheaper relative.	Coax and opt inputs, two-box construction, DAC7 Bit Stream		103
Deltec PDM2 £2000	Excellent Excellent	State-of-the-art technical performance with a pristine sound to match. Repertoire includes a solid, invert, two-box DAC7	Coaxial and optical inputs, phase invert, two-box DAC7	R	101
Forte Audio Model 50 £950	Good Very Good	The first American DAC7 design and one that offers a typically big and full-blooded sound, infiltrated by a slightly euphonic quality but never hard or gritty.	2 Coax and 2 optical inputs, DAC7 Bit Stream technology	R	103
Kelvin PDM DAC £200	Average + Average +	Don't disregard this DAC-in-a-matchbox for though it can sound a little unconvincing it is capable of developing a surprisingly lyrical and natural sound with the right transport.	Single coaxial input, low analogue outputs, SAA7320	R	103
Meridian 203 DAC7 £510	Good Very Good	This is another broadly compatible DAC that's free of fatiguing nasties yet remains bubbly and exciting. If you find the 606 too sober then the 203 will undoubtedly suit	Coaxial and optical inputs, single-box DAC7 Bit Stream	R	101
Meridian 606 DAC7 £1220	Very Good Good	Extra cash buys you a better standard of construction and finish over the 203 yet by refining its sound further Meridian have also tempered its vibrancy and 'life'. Fickle with other transports	Two coaxial and optical inputs, phase invert, DAC7 chipset		101
Micromega Duo BSII £500	Average Good	This DAC has a tendency to sound light, airy and 'fast' but it can also become a little hard or - fatiguing with some digital outputs. At its best with Meridian's 200	Coaxial and optical inputs, phase invert, SAA7321 Bit Stream		101
PS Audio Superlink £1498	Average Good -	Another transport-fussy DAC that, once again, does the business with Meridian's 200 but can sound bloated, smeared and even vaguely electronic with standard 75ohm digital outputs.	Touch-sensitive coax and optical inputs, phase invert, 18-bit		103
Proceed PDP2 £1595	Average Good -	The PDP2 has a wobbly input impedance that's suited to specific drives, ie Meridian 200, or Proceed's own. At its best expressive and enticing, otherwise it can seem gutless and smeared.	Coax and XLR inputs, balanced outputs, 18-bit DACs		103
Stax DAC-Talent £1400	Excellent Good +	Natural, refined and never over-zealous, the DAC Talent is also capable of sounding very spicy and dynamic. Capable of wielding a maturing influence over a light or bright-sounding system	Coaxial and optical inputs, phase invert, mute, 20-bit DACs		101
TEAC D-500 £399	Good + Good +	An unusual combination of NPC oversampling filter and no less than two Philips' DACs. Its reliable 75ohm input infers broad compatibility. A dynamic and 'interesting' sound	Coax and optical inputs, complementary 16-bit DACs.	R	103

The Directory

DIGITAL TO ANALOGUE CONVERTORS (DACs)

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Threshold DAC 1/e £3150	Very Good Very Good	The DAC 1/e can sound beautifully detailed with a marvellous sense of scale and sharp, solid images. Its unpredictable behaviour with unknown transports precludes recommendation.	Coax and opt inputs, balanced outputs, phase invert, MASH/PWM DA		103
Wadia DigiMaster X-32 £2000	Average - Good -	Wadia's freaky input circuit gives unpredictable results with non-Wadia transports. Otherwise it can sound bold, dynamic and crisp but lacks the warmth to bind its music together	BNC and optical (TosLink and HP) inputs, 18-bit 32x		101
Wadia DigiMaster X-64.4 £5000	Average Good*	The X-64.4 positively buzzed with vibrant, sharply-etched detail. An exciting sound	BNC + Toslink/AT&T optical inputs, phase invert, 18-bit 64x		101
Woodside DAC 1 £895	Good Good	Fine but slightly dated and costly package in performance terms - but flexible, musical and t well built	2 electrical + optical i/p. tape ou		87
Woodside DAC2 £510	Good Good +	Based on Woodside's earlier 16-bit CD player and offering a similarly sharp and dynamic sound, all the more captivating for its lack of graininess and 'tizz'. Should be a reliable upgrade	BNC coaxial input (no optical), 16-bit 4x	R	101

DIGITAL AUDIO TAPE

DAT, or digital audio tape, has been on the market for quite some time now but has never really 'made it' as a consumer medium, probably due to the fact that very little prerecorded software has been made available.

In the last year or so it has begun to carve itself a niche at the top end of the market replacing reel to reel tape recorders as the audiophile's tape based medium.

The DAT standard specifies a 48kHz sampling rate, which is higher than CD, so direct copying in the digital domain is only possible on those machines with dual sampling frequencies, ie 48kHz and 44.1kHz. Some machines also record at 32kHz to give a longer recording time for a given length of tape

To try and get around the copying problem many machines incorporate SCMS, the Serial

Copy Management System, a device which enables you to record from a CD but not to 'clone' one digital tape from another.

Portable machines are now entering the market but make sure the price you are quoted includes an analogue to digital converter, with some portables these have to be purchased separately and increase the price considerably.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa HD-S100 £450	Average - Average -	Largely bulletproof in non-critical and semi-critical applications. Despite the usual limitations of DAT as a hi-fi medium, the HD-S100 is a practical and well built tool.	Portable, ADC, mic in, phone/line sockets (3.5mm), 70 min battery	R	105
Aiwa XD-S1100 £550	Poor Average -	A muddled fascia detracts from the appeal of this inexpensive deck, but the real no no is a significant loss of the finer virtues: detail, imagery etc	SCMS, analogue, coaxial & optical in/outputs, full subcode editing		99
Aiwa XD-S260 £500	Poor Poor	Unlovely sounding deck lacks weight, clarity and presence. Low pricing and mini dimensions excuse many sins however	SCMS, optical/coaxial and analogue in, optical/analogue out		99
Denon DTR-2000 £800	Good Very Good	Not cheap, but first rate DAT recorder, good to excellent fidelity in all modes, with a slightly cool detached quality when differences are detectable.	Digital LP/digital & analogue SP rec/play, LP analogue play only	R	93
JVC XD-2505 £620	Good Good	Competent middle market DAT with uncomplicated (but still flawed) user interface, but good basic sound quality. A fine CD dubbing machine.	DAT SP/LP en/decode, low bit conversion, remote control	R	105
Kenwood DX-7 £500Sony	n/a Average	Sound quality is pretty fair, but a little rougher than the best of the breed. Controls are good, the display however is poor - and most users will require the accessory pack	Mains recorder, LP mode. Optional accessory packs adds battery/ADC		94 Supp.
Kenwood DX-7030 £700	Average Average-	Bland sounding deck that lacks low level clarity and imaging. No analogue LP mode. Build quality is good however and ease of use ranks highly	Remote control, stand-alone DAC facility, optical/coaxial in/out		99
Pioneer D-500 £600	Good - Average	Looks extremely good. Fascia design is complex yet accomplished, and offers very slick tape handling. Musically however it is on the messy side compared to others in this price area.	SP/LP en/decode 1-bit converters, many search/display aids		105
Sony DTC-750 £450	Good Good	Superb value for money: the lowest price full size DAT on the market, fine features, build, measurements and sound approaching the best DAT has to offer at any price.	SP/LP record, real time/date recording	BB	105
Sony DTC-77ES £1000	Excellent Average	Superb engineering, many well implemented features (including off tape monitoring) and technical near perfection (!) don't offset perceptibly slowed, thickened sound	4-head, tape monitor, many search/display options, SP/LP		105
Sony DTC-M100 £799	Very Good Very Good	Only available from professional outlets. Clean clear sounding second generation model with most of the features and sound of the DTC-1000ES	Mid-width, alpha-numeric display, remote, optical/interfaces	R	63
Sony TC0-D3 £500	n/a Very Good	At the time of writing, this model represents the state of the art, and beats all comers.	DAT recorder, detachable rechargeable power pack, LP/SP	BB	94 Supp.

EQUIPMENT SUPPORTS

It's becoming more and more apparent that all the components in a hi-fi system benefit from being placed on the right kind of support. It is already acknowledged that performance of electro-mechanical transducers, such as turntables and loudspeakers, can be greatly improved by using highly rigid supports. This notion has been expanded to include electronics such as amplifiers and compact disc players, and inevitably a broad range of stands and supports have been produced to cater for this requirement.

With loudspeaker stands there seems to be two broad schools of design. The most common

is the open frame type which uses square section steel tubing (usually less than an inch square) made up to form a tripod or quadropod stand usually fitted with spikes top and bottom to ensure good coupling to both floor and cabinet. However, for reasons of domestic harmony this latter option is often not pursued as eagerly as perhaps it should be.

The alternative approach is to use mass. Larger section (approximately 3 inch x 2 inch) tubing is welded between square top and bottom plates and filled with sand and/or lead shot. Again, this type uses spikes at the base but Blu-

tack or the like for coupling with the cabinet.

Equipment supports generally place isolation quite high on the list of priorities and usually use a lightweight steel frame to support an MDF platform. Once again spikes are used to minimise contact with the platform and ensure good coupling to the floor. Minimising weight without compromising rigidity seems to be the aim with turntable supports but those designed for electronics often employ some form of damping to kill vibration, sometimes in the form of mass.

EQUIPMENT SUPPORTS - COMPONENTS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE (H x W x D)	VALUE	ISSUE
Alphason R444 £120	Rack Good	A heavyweight structure with stressed MDF shelves, ideally suited to the Sonata turntable	82 x 60 x 39.5cm	R	83
Audioquest Sorbothane Feet £40 for four	Feet Good	These large gumdrops are very useful for damping vibrations in amplifiers and especially CD players.	6.5 x 2.5cm (circular)	R	57
Cornflake TCS6 £60	Shelf Good	A squat and rigid frame supports a Medite top board with four adjustable spikes, better suited to suspended sub-chassis turntables.	43 x 23 x 33cm		83 Supp.
Foundation Stable Table £100 (with Supe	Table Good	Similar to Stand Design's table though less well finished and certainly less stable	64 x 46.5 x 36cm		58
Origin Live Skyline Super £100	Table Good	An asymmetric table that helps provide a quick, lucid and solid sound with most decks	41 x 50 x 40cm	R	83
Roksan Equipment Table £169	Rack Good	An upgradable/expandable system suited to Roksan's Xerxes if not other competing turntables	65 x 52 x 38cm		58

EQUIPMENT SUPPORTS - COMPONENTS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE (H x W x D)	VALUE	ISSUE
Sound Organisation Table £55	Table Very Good	A deceptively simple structure that just happens to be engineered in a thoughtful, and ultimately successful manner.	37 x 45 x 35cm	BB	57
Sound Organisation Wall Stand £40	Shelf Very Good	The first of its ilk and still amongst the best, this simple framework represents a vast improvement over standard furniture shelves.	27.5 x 43 x 35cm	BB	57
Sound Organisation Z022 £97	Table Excellent	A small but costly table made from thin steel tubing. Suited to the LP12 but not other decks	49 x 45.5 x 36cm		58
Stand Design Duplex £75	Table Very Good	Well made and nicely finished, this table is broadly compatible with most heavy turntables	63.5 x 46.5 x 36cm	R	83
Target TT2 £64	Table Very Good	Standing up to the best in most areas, the TT2's only real foible concerns a slight loss of bass 'slam'. Design was updated in 1990	52 x 46.5 x 35.5cm	BB	57

EQUIPMENT SUPPORTS - LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE (H x W x D)	VALUE	ISSUE
Appolo A10 £52.50	4 leg Average	A robust and lightweight model, it would make an ideal upgrade for those still happy with the big boxes of old.	19 x 19cm 44cm	R	58
Appolo A820 £44	4 leg Average	A light open-framed budget design slightly lacking in rigidity and subjectively superceded by other stands costing £10 more.	19 x 19cm 53cm		58
Foundation Fred £70	2 leg Average	With sand filling the Freds made speakers sound tight and coherent with a more even balance.	19 x 19cm 36/43/59cm		58
Foundation Maggi £159 to order	Plinth Very Good	Made for Magneplanar and other similar panel speakers they seem to have a healthy effect on the sound quality thereof.	50 x 2cm 2cm	R	58
Foundation Pi £269 to order	2 leg Very Good	Overpriced in material terms the Pi nevertheless has a very positive effect on the low frequency performance of conventional speakers.	20 x 20cm 25/38/46/5	R	58
Foundation Sir Fred £80	2 leg Good	Upgraded 'Fred' with special in-fills. Sweet sound but one that also lacks bite and edge	19 x 19 x 46.5cm		83 Supp.
Golding Black Satin £65	1 leg Very Good	Screw together stand tastefully hewn from medite. Some loss of bass but still pleasantly rhythmic	18 x 20 46cm	R	83 Supp.
Heybrook HBS1 £109	4 leg Very Good	With its new aluminium base frame the HBS1 fared very well in the listening tests. It allowed much of the speakers own 'sound' to remain intact.	23 x 21cm 47cm	R	58
Heybrook P5S £69	3 leg Very Good	An unusual triangulated open frame stand that can help certain speakers sound more transparent and fluent - a good value stand	23 x 21.5cm 47cm	BB	58
Linn Kan II £101	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 £112	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
Origin Live Three Leg £89	3 leg Good	An unusual tripod stand devoid of top plate and taking up more floor space than normal, subjective and technical performance was exemplary.	(support area) 22 x 17.5cm 52cm	R	58
QED TS22 Tristand £60	3 leg Very Good	Most tracks sounded uplifted or buoyant, never thick nor coloured. It worked well with most of the speakers tried and encouraged a fluid and revealing midband.	19 x 17cm 45/50/58cm	BB	58
Standesign Z20 £75	1 leg Excellent	Well built and finished with optional sand in-fill. Ideally suited to Wharfedale 505.2's	16.5 x 19 50cm	R	83 Supp.
Target HJ15/3 £107	3 leg Very Good	Sound quality was basically very good though without the sand infill some loudspeakers may sound a little unbalanced as both bass and treble regions are subjectively exaggerated.	28 x 28cm 40cm	R	58
Target HS20 £64	1 leg Excellent	This monopod stand can be used either filled or unfilled and encourages different characteristics in the speakers sound accordingly	19 x 16.5cm 53cm		58
Target T-40 £51	2 leg Very Good	Not very stable, tends to infer a slightly forward, ragged sound with diluted pitch	19 x 19 40cm		83 Supp.

HEADPHONES

There are a variety of different approaches to headphone design, and examples of each turn up in this group. Amongst the more expensive esoteric models, electrostatic drivers are used in square open-backed phones such as the Jecklin and Stax models.

The majority of these come with some form of transformer which takes the signal initially from the speaker terminals on the amplifier. The actual speaker cables then travel from this unit

bypass switch to the loudspeakers.

The more down to earth models feature dynamic drivers in circular open-backed designs. The advantage of open backs seems to be a correspondingly open sound and a less claustrophobic feel to the music.

One can also of course hear external noises, as well as irritating the hell out of people on public transport

The third category are closed-back designs,

which are useful in situations where it is necessary to block out background noise. Another means of distinguishing different types is the way they sit on your head.

There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs press on the outer ear (pinna); and intra-aural types rest inside the ear and are popular amongst users of personal stereos.

MODEL PRICE	FIT SOUND	COMMENTS	TYPE	VALUE	ISSUE
Aiwa HP-X30 £31	Good Good -	A flashy personal stereo phone which alternatively could be used at home. A slight LF tonal preference slightly colours the response, but it ain't a bad can	Supra-aural, closed-back, dynamic		75
AKG K1000 £500	Very Good Excellent	One of the best moving coil headphones on the market, hooks directly to speaker outputs and makes much of the competition sound lame. Looks a tad weird	Extra-aural, open-back, dynamic	R	99
AKG K135 £33	Poor Average	Despite a very appealing design the K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural, semi-open, dynamic		63
AKG K145/S £60	Good + Good +	Electrostatic tweeters combine with a dynamic mid/bass unit to create very confident sounds in a comfortable headphone. Balance is on the bright side	Supra-aural, semi-open, electrostatic/dynamic	R	75
AKG K240 Monitor £60	Very Good Good	Something of a classic, these AKGs are very user friendly in all respects; sonically on the warm side of neutral	Circumaural, semi-open, dynamic	R	63
AKG K280 Parabolic £90	Good Very Good	A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural, open-backed, dynamic	R	63
AKG K340 £140	Good Excellent	Heavyweight cans in most respects, the K340 with its electrostatic tweeter is a very revealing headphone. Gives the total electrostatics a good run for their money	Circumaural, closed-back, electrostatic/dynamic	R	75
AKG K44 £40	Good+ Average	Good quality personal oriented phone, could have a better sense of space but is musically quite communicative	Supra-aural, open-back, dynamic		99
Audio-Technica ATH-609 £31	Average Average-	Warm feeling and sounding with impressive physical substance for the price, could be more relaxed and open	Circumaural, open-back, dynamic	R	99

The Directory

HEADPHONES

MODEL PRICE	FIT SOUND	COMMENTS	TYPE	VALUE	ISSUE
Audio-Technica ATH-611 £51	Average Good	Same basic design as 609 but bigger thinner diaphragm makes this a more relaxed and informative headphone	Circumaural, open-back, dynamic		99
Audio-Technica ATH-909 £60	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 £70	Average Good	The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural, closed-back, dynamic	R	55
Audio-Technica ATH-911 £80	Very Good Very Good	Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural, open-backed, dynamic	R	63
Beyer DT 325 £32	Very Good Average	Lightweight in more ways than one, the 325s may be a little bright for some systems and tastes but will suit duller sources	Supra-aural, open-back, dynamic	R	63
Beyer DT330 Mk II £50	Good Poor	Not the most revealing 'phones encountered, the 330s were nevertheless enjoyable and rarely offended	Circumaural, semi-open, dynamic		55
Beyer DT550 £61	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 £80	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 £102	Very Good Very Good	The 990s are definitely a significant pair of dynamic headphones; they have a smooth and yet revealing neutral sound that is hard to criticise	Circumaural, open-back, dynamic	R	55
Beyer IRS690 £203	Good + Very Good	High quality infra-red headphones with soft comfy earpads and mellow but informative sound quality which is hard to dislike	Circumaural, open-back, dynamic	R	75
Jacklin Float Electrostatic £399	Good Excellent	One version of the state-of-the-art, these electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural-ish, open-back, electrostatic	R	55
Jacklin Float Model One £79	Good Very Good	Whilst very unusual in appearance, the Floats give remarkable sound quality and openness at a reasonable price	Circumaural-ish, open-back, dynamic	BB	55
Jacklin Float Model Two £99	Good Very Good	Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. Note lack of adjustment means you should try before you buy	Circumaural-ish, open-backed, dynamic	R	63
JVC HA-D990 £65	Good + Good +	Good looking well made cans that offer good sound quality for the money. Sonic nature is of the easy-going, laid-back variety	Supra-aural, closed-back, dynamic	R	75
Koss K/6X Plus £30	Average Poor	'Sixties-style' phones from the good ole US of A, their sonic style is unique and can make a system sound quite different	Supra-aural, closed-backed, dynamic		63
Koss TD/60 £20	Good Average	Although they're devoid of channel identification and have a decidedly Stateside approach to sound, these are very listenable phones for the price	Supra-aural, closed-back, dynamic		75
Pioneer SE-72 £30	Good + Average -	Neat, very nicely made personal stereo phones along the lines of Sony V3s. Sound is on the veiled side, good for aggressive sources	Supra-aural, closed-back dynamic		75
Quart Phone 30 X £40	Good Average	Slightly dark character makes these more suitable for some sources/material than others, specifically music that needs bass weight	Supra-aural, open-back, dynamic		99
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 Phone 95 X £100	Good+ Good+	Can sound even handed, relaxed and open with a good drive system but may be a bit too transparent for lesser headphone outputs	Circumaural, open back, dynamic	R	99
Ross RE2530 CD £20	Average Average	Rather an 'average' £20 phone that some found uncomfortable due to high pressure on the ears. Sonic balance is on the bright side	Supra-aural, closed-back, dynamic		75
Ross RE2560 CD £25	Good Average +	If you're not too fussy about quality of finish and don't have an elfin head then these British phones warrant attention. Sound could be smoother	Supra-aural, semi-open, dynamic		75
Sennheiser HD40 £20	Very Good Good -	Very light and comfortable headphones with an even sonic balance that will suit most sources, but jack is 6.3mm and not suited to personals	Supra-aural, semi-open, dynamic	BB	75
Sennheiser HD450II £40	Good+ Good-	A neat looking supra that makes quite acceptable noises with a variety of outputs, could sound more spacious but is pleasantly relaxed	Supra-aural, open-back, dynamic		99
Sennheiser HD480 Classic II £60	Good+ Good	The same basic design as the 450 but improved sound quality as a result of aluminium coil and extra damping, natural with good bass	Supra-aural, open-back, dynamic	R	99
Sennheiser HD520 £65	Good + Good +	A very comfortable and musically capable headphone. If you've got this sort of bread to blow on cans, give 'em a blast	Circumaural, semi-open, dynamic	R	75
Sennheiser HD530 £75	Very Good Good +	One of the better dynamics in its group, the 530s create a sense of space that eludes most sub £100 cans, and they're dead comfy to boot	Circumaural, semi-open, dynamic	R	75
Sennheiser HD540 Ref Gold £160	Good Very Good	The 540 Golds prove that dynamic headphones can be subtle, informative and capable of creating a remarkable sense of space	Circumaural, open-back, dynamic	R	55
Sennheiser HD560 Ovation II £120	Very Good Good+	A comfortable and nicely styled headphone that could be more natural sounding at HF, but is detailed and open with good power	Circumaural, open-back, dynamic		99
Sony A21EX £20	Good - Good -	Forward facing in-ear drivers on a folding plastic band provide exceptional clarity for such an inexpensive phone. However, no bass, and fit isn't to everyone's taste	Intra-aural, semi-open, dynamic	BB	75
Sony MDR-CD3000 £300	Very Good Very Good	Better than most of the headphone outputs around so hard to make the most of, potentially up there with the electrostatics	Circumaural, closed-back, dynamic	R	99
Sony MDR-CD350 £32	Good+ Good	Very impressive for the price the 350 is possibly the most open sounding cheap closed back can around, lightweight in balance but transparent	Circumaural, closed-back, dynamic	BB	99
Sony MDR-CD550 £50	Good+ Good+	A very competent headphone for the price, creates a remarkable sense of space for a closed back design and sounds natural to boot	Circumaural, closed-back, dynamic	BB	99
Sony MDR-R10 £2500	Excellent Excellent	Costly state of the art sealed moving coil design built to the highest standards using the finest materials. Sound quality reflects this care, being big, clear, sweet and refined	Circumaural, closed-back, dynamic	R	72
Stax Gamma pro/SRD-X pro £296/£230	Very Good Excellent	The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural, open-backed, electrostatic	R	63
Stax Lambda Signature/SRM-T1 £470/£895	Very Good Excellent	The Signature when combined with the SRM-T1 valve driver must be the most transparent headphone available	Circumaural, open-backed, electrostatic	R	72
Stax SR Gamma £299 (inc. SRD-6 Adaptorat £100)	Very Good Very Good	The next model down the Stax range from the Lambda, the Gamma is an excellent headphone with little to criticise but the price	Circumaural, open back, electrostatic	R	55
Stax SR Lambda Pro/SRD-7SB Mk 2 Adaptor £360/£185	Very Good Very Good	A bit of an industry reference, the Pros are frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural, open-back, electrostatic	R	55
Stax SR Lambda Pro/SRM-1 Energisier £360/£635	Very Good Excellent	This combination extracts layers of information that other headphones only hint at. The SRM-1 has more edge than the SRM-T1, but it's good	Circumaural, open-back, electrostatic	R	75
Stax SR34 £140	Average Very Good	The least expensive Stax headphones around, the SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural, open-back, electret		55
Stax SR84 £210	Very Good Very Good	The stepping stone between dynamics and full electrostatics, these electret phones are revealing, open and highly enjoyable	Supra-aural, open-backed, electret	R	63
Yamaha YHL-006 £30	Average Average	Unusual personal stereo oriented phones that curl up when not in use. Earphones are like golf balls and balance is well suited to Walkmans	Supra-aural, open-back, dynamic		75

LOUDSPEAKERS

Last item in the hi-fi chain, to some extent the loudspeaker is merely the slave of what has gone before, capable only of reproducing a signal as good as it is fed. Nevertheless the distortions (colorations and stereo effects) introduced by loudspeakers (and rooms) tend to be more immediately obvious than those anywhere else in the chain, so careful choosing according to taste is very important.

The average loudspeaker consists of a smallish enclosure, much of which may have begun life as part of a tree, plus a couple of drive

units hidden behind a removable grille. Inside the box lurks a simple electrical circuit known as a crossover, which divides the incoming (full range) signal into the right bits for the drivers to handle. Variations on the above formula are specifically identified in the entries. The designer's primary task is to balance the sensitivity of the loudspeaker (how loud it goes for a given electrical input) against the bass extension (how low does it go) for the given box size. After that such subtleties as coloration and dispersion come into the equation.

Careful placement of the loudspeakers within the room is as important as the initial choice of model.

For good stereo they need to be more or less the same distance from nearby walls, and preferably on rigid stands. The listener should be about the same distance from and listening angle to each loudspeaker. The ideal placement depends on the way a particular model has been balanced (not to mention a number of other factors), and our recommendation is given in the entries.

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	ISSUE
ATC SCM20 £1320	Very Good Good +	Massively built to no-compromise Pro monitoring standards, the SCM20 is invariably informative but the rather forward presentation can be uncomfortable	44 x 24 x 31cm stands close to rear wall	82dB/w 28Hz (in room)		86
Acoustic Energy AE1 £767	Good Good	Amongst the best miniatures around, this metal driver pioneer shows exceptional mid focus and coherence, but is pricey and could be faster and more agile.	29.5x18x25cm stands clear of wall	84dB 48Hz (in room)		102
Acoustic Energy AE2 £916	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, free	88.5dB 45Hz	R	66
Acoustic Energy AE3 £1650	Very Good Very Good	Solid, authoritative and impressively accurate – if a shade ponderous and slow – AE's latest 'big one' is a much better bet than the earlier '4, combining	63 x 26.5 x 37cm low stands in free space	85dB/w 23Hz (in room)	R	86
Acoustic Research AR-112 £125	Average Average -	Nicely presented and engineered, but sounds a bit small and boxy without true coherence	36 x 19 x 18.5cm stands near rear wal	87dB/w 75Hz		66
Acoustic Research AR-122 £150	Average Average	Despite a promising enough list of ingredients, the 122 failed to excite real enthusiasm amongst the listening panel	38.5 x 19 x 22cm stands near rear wal	87dB/w 68Hz		68
Acoustic Research AR-132 £200	Average + Average -	Good presentation and detail engineering was not sufficient to counter bass heavy balance problems on auditioning	44.5 x 23 x 25.5cm stands 1ft from rear	87dB/w 50Hz		66
Acoustic Research AR-152 £373	Good Good-	Large bookshelf size model with luxury finish has a slightly thin overall balance, but fine coherence and agility makes it well worth considering	44 x 23.5 x 28cm stand 1-2ft wall	87dB 25Hz in room		98
Acoustic Research Red Box £100	Average Average	Lively and balanced if a bit crude and uneven, this econobox succeeds partly because of its simplicity, and works well with some rear wall assistance	32 x 19.5 x 17cm close to rear wall	87dB/w 85Hz	R	74
Alexander SE11 £299 (s)	Good Good	Clearly better than its cheaper stablemates, the metal jacket delivers a different – and in some respects superior – sound than the wood-based	52 x 14 x 17.5cm stands close to wall	86dB/w 25Hz (in room)	R	82
Alexander SE5 £199	Average Average	Particularly well suited to surround sound A/V applications, the SE5 can give any miniature a run for its money on bass performance; hardness and coloration	40.5 x 12 x 15cm ALS stands near wall	82dB/w 50Hz (in room)		78
Allison AL100 £120	Average- Average	Loud and lively budget wall-mount is bigger and beefier than most of the competition, if lacking some subtlety and refinement	33.5 x 24 x 21.5cm stands against wall	87dB/W 30Hz (in room)	BB	94
Allison AL105 £150	Average Average -	Pretty enough in appearance, sonically the AL105 doesn't really make the grade at the £150 asking price	37 x 24 x 21cm high stands against wall	87dB/w 45Hz (in room)		78
Allison AL110 £220	Good+ Good-	Compact bookshelf model is a little dry and mid forward, but bass is extended and solid. Free space balance is good, though build quality could be improved.	40x24.5x22.5cm stands 1-2ft from wa	86dB 28Hz (in room)	R	102
Allison AL120 £429	Good Average	Cleverly engineered compact floorstander is pretty well balanced if slightly mid forward, but sound quality is a little disappointing for the price	63 x 28 x 27cm floor, clear of walls	88dB 30Hz (in room)		98
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	88dB/w 45Hz	R	71
Allison MS 200 £220	Average- Average-	Built as small and solid as a brick, this micro-miniature has limited bass and bright balance, but sounds agile and communicative	25.5 x 14.5 x 15cm 50Hz (in room)	85dB close to wall		106
Alphason Amphion £680	Good Good	This fine-sounding, nicely finished compact wall-mount is just a little too expensive for formal Recommendation, but is a good performer for all that	44 x 23 x 27.5cm high stands against wall	88dB/w 47Hz (in room)		78
Alphason Artemis £299	Average Average+	Pretty little miniature sounds nicely unboxy but is also a bit short of punch and balanced rather too bright.	27 x 17.5 x 22cm stands 1ft from wall	86dB/W 50Hz (in room)		94
Alphason Orpheus £1000	Good Good +	Large hi-tech two-way features unusual, sweet-sounding isodynamic tweeter; well engineered and balanced if a shade odd in appearance	65.5 x 28 x 34cm stands near rear wal	87dB/w 43Hz	R	71
Apogee Caliper Signature £3998	Good + Very Good	Pretty but power hungry full range panels have remarkable transparency and delicacy, though loudness and bass 'grunt' are both a bit lacking	122 x 59-70 x 6.5-28cm floor, free space	81dB/w 30Hz (in room)	R	81
Arcam Alpha £200	Good Good	It has its own colorations to be sure, but delivers a fine room balance with unusually good dynamics, timing and 'life', and is fine material value	46 x 26.5 x 26cm stands close to wall	89dB/w 30Hz (in room)	BB	82
Arcam Delta Two £340	Average+ Good	Pretty luxury compact sounds a shade forward and coloured but has dynamic and lively bass for its size	37.5 x 22.5 x 27.5cm stands 1-2ft from wa	87dB/W 40Hz (in room)	R	94
Ariston Image £180	Average - Average -	Despite a sweet treble character, the Image fails to impress with a 'lumpy' over-rich balance that has room integration problems	42 x 22 x 27.5cm stands in free space	89dB/w 28Hz (in room)		82
Ariston Q £395	Average + Average	The prettily shaped Q delivers a good impression of scale from a small box, but a rather laid back, ponderous and over-rich overall sound	35 x 16.5-25 x 20-27cm high stands in free	85dB/w 30Hz (in room)		86
Audio Electronics TC10 II £599	Good - Good +	Oddball appearance is rescued by a respectable technical performance, interesting and impressive engineering and fine sound quality	70 x 33.5 x 33.5cm low stands in free space	87.5dB 40Hz	R	68
Audio Note AN-E £1300	Very Good Very Good	Lovely coherence, great midband dynamics and transparency, extended bass and high sensitivity – pity it's so darn ugly!	80 x 36 x 28cm 20Hz (in room)	90-91d low stands, free space	R	106
Audioplan Kontrapunkt £799	Good Good +	Cute little German miniature sounds as sweet as it looks, dressed expensively in real wood with matching stands. Not for bass or loudness freaks	31 x 24 x 13cm free space, matching stan	83dB/w 48Hz (in room)	R	86
B&W 610 £200	Good Average	Fine presentation and good perceived value, with good in-room bass extension and impressive loudness credentials too, but rather indifferent integration and coherence.	49x23.5x30cm stands clear o	89dB/W 25Hz(in room)		102
B&W 620 £299	Good Good	Good value floorstander has well balanced, laid back and slightly lazy sound that is pleasantly easy on the ears; could do with its own spikes	74 x 23.5 x 30cm floor, free space	89dB/W 25Hz (in room)	BB	94
B&W CM1 £400	Good Average	Cleverly thought out luxury design package is also fundamentally well engineered, if a shade pricey on 'sound for pound' basis	24.5 x 16 x 22cm close to rear wall	84dB/w 90Hz		74
B&W DM550 £149	Good + Average -	Beautifully presented, well engineered near-miniature with precise sound but a distinct lack of 'wellie'. Ideal for considerate flat dwellers	35 x 20.5 x 22.5cm stands in free space	86dB/w 70Hz		71
B&W DM560 £199	Average + Average -	Fine cosmetic presentation and good engineering for the price; overload protection may be handy but listening panel was underwhelmed	49 x 23.5 x 30cm stands in free space	88dB/w 55Hz		66
B&W DM600 £150	Good+ Average+	Attractive hi-tech appearance and clever engineering makes for an impressively smooth overall balance, but sound is a touch bland with it	35 x 20.5 x 25cm stands 1-2ft from wa	85dB 30Hz (in room)	R	98
B&W Matrix 801 £3295	Good + Good +	Lacks the transparency of the best panels, and the drama of the best dynamics, but is something of an acoustic tour de force, with low coloration and fine imaging	77/99 x 56 x 43cm floor or stands, fre	86dB/w <20Hz (in room)	R	81

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	ISSUE
B&W Matrix 805 £915	Very Good Good	A genuine compact monitor, stylish, with remarkable imaging properties, good balance and low coloration, though less successful at communicating musical	42(max) x 26 x 22.5cm Slate stands in free	87dB 30Hz (in room)		98
B&W Vision DS1 £120	Average Average -	Although significantly hampered by upper bass cabinet coloration, the DS1 cleverly combines high sensitivity with a rich and generous soundstage	36 x 21 x 19cm stands quite close to wall	91dB/w 40Hz (in room)	R	82
B&W Vision DS2 £180	Average Average -	Although the box is generous for the price, the DS2 is a rather uneven performer, both on the measurement and listening.	50 x 24 x 25cm stands in free space	89dB/w 43Hz (in room)		86
Bose 305 £350	Average Good -	A bit of an oddball, fine dynamic liveliness and a good room match more than make up for the strange stereo imaging and treble	28 x 45 x 23cm high stands near wall	88dB/w 40Hz (in room)	R	78
Bose 901 MK6 £1600	Good Average	Still controversial after all these years, the pre-equalised multi-driver 901 is cleverly engineered to deliver exceptional loudness.	33 x 54 x 32cm rigid stands in free space	(92dB/ midband) 28Hz (in room)		86
Bose Interaudio 3000XL £150	Average Average -	Lots of perceived value and well enough balanced, but low cost cabinet and driver engineering results in a crude and unsubtle sound	46.5 x 29 x 23cm stands in free space	89dB/w 45Hz		71
Boston A120 £349	Average + Good -	Ugly but cleverly engineered, the 120 combines a tiny main driver with much larger ABR to give a generous, bighearted and lively sound despite little bass	62.5 x 31.5 x 25cm stands in free space	89dB/w 48Hz	R	86
Boston A40II £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 63Hz		41
Boston Acoustics T830 £399	Good Good	A lot of speaker for the money, the T830 is a smooth and accomplished performer with a big and easy - or alternatively a lazy and laid back - sound	82.5 x 25.5 x 24cm floor, away from wal	87dB/w 30Hz (in room)	R	82
Brinkmann Endymion £395	Average- Average+	Omnidirectional design with rococo styled urn-shaped ceramic enclosure. Distinctly bass light, but sounds impressively coherent and solid	48 x 29 (diam)cm 50/150Hz (in room)	85-87d stands in free space		106
C-J Synthesis LM210 £895	Good Good+	Elegant compact US floorstander is eminently relaxing and listenable, with open and coherent midband, if a bit short on welly and drive	90 x 26 x 27cm 28Hz (in room)	86dB clear of walls	R	106
Cambridge SoundWorks Ambianc	Average Poor	Attractively styled sub-miniature sacrifices sensitivity in the interests of bass extension, but manages to lose dynamics along the way too	28 x 18 x 14cm close to wall	83dB/W 45Hz (in room)		94
Canon S-50 £349	Average Average+	Though only a small cone miniature at heart, the fascinating styling and extended stereo listening area feature make it utterly original and unique.	30x24(diam)cm stands in free space	84dB 48Hz (in room)	R	102
Castle Chester £599	Good Very Good	A brilliant throwback, using horn-type approach to provide startling midrange dynamics and coherence.	94 x 23 x 27cm floor, experiment	87dB 45Hz	BB	98
Castle Durham £259	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 £379	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 SG Trent £129	Average Average	The grey paint finish looks much more modern than black vinyl woodprint, and this miniature wall-mount sounds lively and engaging, if a bit rough at the top.	33.5x18x20cm stands close to wall	88dB 50Hz (in room)	R	102
Castle Warwick £229	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	88dB/w 50Hz		66
Castle Winchester £1400	Very Good Very Good	This unconventional and beautifully crafted model is physically large for its bass extension but is engagingly agile and sounds attractively open and airy	114 x 24 x 47cm in free space	87dB/w 25Hz	R	90
Celef CF2 Nimbus £230	Good - Good -	Nicely balanced overall but a little uneven with it, this lively and dynamic largebookshelf model came close recommendation	46 x 25.5 x 24cm stands in free space	88dB/w 55Hz		71
Celef Cirrus £180	Average Good	It's nice to see Celef back in the UK, with this decent sounding small reflex box that seems unusually tolerant of siting	39 x 20.5 x 23cm stands in free space	84dB/w 60Hz	R	66
Celestion 3 £109	Average + Average	This attractive little wall-mount gives good balance and stereo imagery, with a character which leans more towards indolence than excitement	31 x 18.5 x 21cm high stands against wall	86dB/w 55Hz (in room)	R	78
Celestion 5 £149	Good Average	Cunningly conceived and balanced, the 5 may be a little slow for some tastes, but is well suited to CD-oriented budget systems	35 x 20.5 x 26cm heavy stands close to wall	89dB/w 30Hz		90
Celestion 6000 £1470	Very Good Very Good	A genuine fullrange audiophile quality speaker system - with Star Wars styling to suit a high tech environment	Complex, on floor in free space	82.5dB	R	60
Celestion 7 £200	Average Average+	Good value, good looking large bookshelf size wall-mount has lively up front presentation. Can sound a bit coarse and stand selection is critical.	45 x 24.5 x 32cm heavy stands close to wall	87dB 30Hz (in room)	R	98
Celestion 9 £249	Good Average	Nicely presented and fair material value, with impressively flat bass-to-mid balance, the 9 doesn't really make a convincing case for the return of the three-way.	49.5x20.5x24cm stands clear of wall	89dB 30Hz (in room)		102
Celestion DL6 Series II £179	Good Average	Good tonal colouring and plenty of bass for the enclosure size; the metal dome tweeter is excellent, but bass and mid lack clarity and 'bite'	45.4 x 24.5 x 26.2cm near wall, on stands	87dB/w 65Hz		59
Celestion DL8 Series II £199	Very Good Good	A refined middle market speaker has a smooth but slightly dull quality, with good definition and deep, if slightly boxy bass	50 x 27.5 x 27.8cm open, stands	87.5dB 60Hz	R	59
Celestion SL12Si £599	Average Average	Careful setting up does reveal elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling	53 x 20 x 27cm matching stands clea	85dB/w 50Hz		66
Celestion SL600Si £799	Good + Good	This Aerolam high tech miniature has certain remarkable qualities that some will find irresistible, but needs careful system and room matching	27 x 20 x 23cm free air on tall stands	82dB/w 52Hz		68
Celestion SL6Si £399	Average+ Average+	This stereotype luxury compact can sound a bit dull and congested, but really opens up on Slate Audio stands; favours CD	37.5 x 20 x 25cm stands 1-2ft from wa	86dB/W 30Hz (in room)		94
Creek CLS20 £200	Good Average -	Looks good material value, but sound is distinctly over-rich and thick in the mid-bass region; maybe the box is a little too large.	49 x 24.5 x 24cm open frame stands, free	88dB/w 30Hz		90
DCM Timeframe TF250 £350	Average + Average	Neat and unusual floorstanding presentation, marred by indifferent build and cuddly but rather coloured sound, especially on spoken word	86 x 32 x 16cm close to rear wall	88dB/w 45Hz		90
Dali 700 £600	Very Good Average	Good material value and fine bass extension for size and price, but overall sound is disappointing, perhaps due to complexity of driver array	110 x 28 x 35cm clear of walls	88dB/w 20Hz		90
Diamond Acoustics Ref III £895	Average Good+	Lovely freestander suffers from indifferent bass alignment, but is fast, coherent, solid and very informative indeed.	87 x 27.5 x 28cm 30Hz (in room)	90dB well clear of walls	R	106
Duntech PCL1000 Crown Prince £8478	n/a Excellent	Immensely 'listenable', refined sounding speaker capable of creating lifesize musical images. Not overly transparent to source, but very civilised	180 x 30.5 x 43.5 free standing away from	90dB/w 42Hz	R	72
Duntech PCL500 Marquis £5250	n/a Very Good	Better value for money than the Crown Prince - and arguably more dynamic, with real bass 'slam' but a little less refined in the higher registers	147.5 x 27 x 40cm free standing away from	92dB/w 48Hz	R	65
Elitax Linear Response 8 £399	Average- Average+	Good material value Danish floorstander suffers from 'loudness contour' balance due to twin main drivers, but nevertheless has pleasing coherence	97 x 21 x 33cm floor, free space	88dB 22Hz		98
Epos ES11 £300	Good Good+	Pretty luxury compact uses integral baffle/driver to give a remarkable combination of low coloration, transparency and speed; bass is a bit shy	37.5 x 20 x 25cm stands 1ft from wall	86dB/W 45Hz (in room)	BB	94
Epos ES14 £449	Good Very Good	Substantial stand model delivers delightful midrange focus and delicacy with good bass control. Tends to be system sensitive	49 x 22.5 x 29cm own stands 1-2ft from wa	85dB 25Hz (in room)	R	98
Equation 0 £1290	Average + Very Good	Expensive but most attractive floorstanding miniature. Bass is limited and mid tends to shout but sound is fast and lively with fine dynamics and timing	85 x 20 x 35.5cm floor, c1ft from wal	85dB/w 45Hz	R	90
Faraday FS5 £589	Good Good	Pricey and ugly, but with its own sonic charm nonetheless, thanks to the substantial (largely positive) influence of the concrete enclosure has upon the sound	46x27x26cm stands in free space	90dB 28Hz (in room)		102

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	ISSUE
Faraday Siren £330 (d)	Average- Average-	Interesting if ugly high mass concrete cabinet is let down by imbalance of ageing driver combination	46 x 27 x 27cm stands, free space	87dB/W 48Hz (in room)		94
Goodmans HIM 440 £350	Good Average -	Amazing perceived value, sensitivity and good bass extension, marred by serious cabinet coloration, a nasty tweeter and a difficult amplifier load	87 x 38 x 40cm low stands clear of wall	94dB/w 24Hz		90
Goodmans M100 £80	Average + Average -	Effectively a Maxim on the cheap, the M100 measures more smoothly but sounds somehow less involving than its more famous stablemate.	20 x 17 x 26cm close to rear wall	85dB/w 50Hz (in room)	R	86
Goodmans M300 £100	Average Average -	Conveying much of the charm and life which has made the Maxim 2 so popular, the M300 is sensitive, bu hampered by upper bass cabinet coloration	38.5 x 21.5 x 17cm stands close to rear	89dB/w 50Hz (in room)	R	82
Goodmans M500 £130	Average Average-	Large 'bookshelf' size means plenty of speaker for the money plus good sensitivity, let down by unruly mid/bass performance and indifferent build	47 x 24.5 x 21.5cm stands, free space	89dB/W 50Hz (in room)		94
Goodmans Maxim 3 £110	Good Average	Smooth and accomplished wall-mount miniature makes a worthy replacement for the bestselling Maxim 2	26 x 17 x 21cm stands against wall	85dB 50Hz (in room)	R	106
Harbeth HL Compact From £5	Very Good Average	The clean and neutral sound lacks resolution and gives rather unobtrusive though well differentiated stereo. Can be bi-wired to advantage	52 x 27.2 x 28.1cm open space, on high	87.5dB 65Hz		59
Harbeth LS3/5A £343	Good Average	Still a classic miniature, though not to every taste, and none the better for the recent update under our listening conditions. Limited dynamic range	30.5 x 19 x 16cm stands in free space	81dB/w 60Hz		66
Heco Interior 120 £169	Good Average	Drab appearance belies a lively enough character, though the balance is altogether a bit bright for UK tastes	32 x 23 x 23cm high stands against wall	88dB/w 50Hz (in room)		78
Heco Interior 430 £429	Good Good -	This tall floorstanding enclosure delivers an impressively even sound balance with good bass extension, if not the lively dynamics to satisfy enthusiasts	85 x 24 x 27.5cm free space	88dB/w 43Hz	R	71
Heco Interior 90 £159	Good Average -	Neatly finished and engineered miniature, but the disappointingly 'lifeless' sound left the listening panel decidedly underwhelmed	27 x 18 x 16cm on high stands	87.5dB 90Hz		74
Heco Interior Plus 404 £400	Average+ Average+	Odd shape and size; twin main driver arrangement creates a slight 'boom'n'lizz' effect, but mid focuses well and bass extension is impressive	58 x 26 x 31cm low stands free space	88dB/W 25Hz (in room)		94
Heco Presto Superior 750 £600	Good+ Average	Tall slim and attractive floorstander delivers a fine, even in-room balance but lacks transparency, coherence and dynamic drive	95 x 24 x 27cm 22Hz (in room)	87dB clear of walls		106
Heco Reflex 10 £160	Average+ Average	This nicely balanced and well mannered small bookshelf wall-mount is a competent rather than exceptional package for the price, thanks to indifferent build.	32x21x23cm stands up to 1ft fro	90dB 30Hz (in room)		102
Heco Superior 740 £599	Good Good -	A similar sonic package to the cheaper Interior 530, these Superior clothes are very pretty indeed, though spikes are still awaited	84.5 x 22 x 25cm on floor in free space	88dB/w 30Hz (in room)		78
Heco Superior 940 £999	Good Good	This large and beautifully finished floorstander has an impressively smooth and transparent midband. Bass is well extended but follows rather than drives the music	110 x 26 x 31.5cm free space	88dB/w 20Hz		86
Heybrook HB1 S3 £250	Average+ Good	Latest version of long established favourite delivers good liveliness and fine coherence for the price, even though the shape looks a bit dated	47 x 29 x 24cm HBS1 stands close(ish) to	88dB 30Hz (in room)	BB	98
Heybrook HB100 £279	Average + Good	Well matched for wall siting, the HB100 is a lively and informative performer in the tradition of the popular HB1	47 x 26 x 28cm stands near rear wall	86dB/w 50Hz	BB	66
Heybrook HB150 £369	Average Good	Convincingly communicative but a bit coloured and congested, this lively compact wall-mount is nicely finished but a little costly for the content	40.5 x 23 x 22cm stands close to rear	89dB/w 42Hz (in room)		82
Heybrook HB200 £429	Average Average	This luxury successor to the HB2 is lively and informative, but sounded insufficiently balanced to convince our listening panel	46 x 23 x 26cm stands against rear wall	87dB/w 55Hz		66
Heybrook Point 5 S2 £179	Good Good	Lively, revealing and enjoyable wall-mount can sound unruly with multi-strand but comes dramatically into focus with solid core cable.	37.5 x 23 x 24.5cm HBS1s against wall	85dB/W 28Hz (in room)	BB	94
Heybrook Point 7 £185	Average Average	Physically an attractive package, but not entirely convincing in lab or listening panel test; interesting for all that	40.5 x 23 x 23cm stands against rear	85dB/w 60Hz		68
Heybrook Sextet £949 (i)	Good Very Good	Elegant floorstanding three-way wall-mount is engagingly coherent and a highly analytical, partly due to distinct and not always comfortable upper-mid forwardness.	96x27x20cm close to wall	85dB 25Hz (in room)	R	102
Heybrook Solo £159	Average + Average +	Discreetly styled wallmount sounds a little untidy in both bass and treble but handles complex rhythmic material much better than most	36 x 23 x 22cm HBS1 stands close to wall	87dB/w 28Hz	R	90
Infinity Kappa 6 £795	Good Good	Interestingly styled US loudspeaker has unusual high tech drivers and good neutrality, but the sound seriously lacks excitement	63 x 38 x 24cm stands, free space	88dB/w 35Hz		66
Infinity Kappa 8 £1850	n/a Very Good	Very nicely made and unobtrusive but large four-way speakers which have a tendency to sound bass heavy unless used with solid core cables	118 x 51.5 x 17.5cm floor standing, open	89dB/w 33Hz		72
Infinity Modulus £695	Good Average +	Luxury high-tech miniature, carefully conceived and beautifully built. Undeniably attractive in the mid and treble, it failed to handle the bass as successfully	30 x 18 x 26cm high stands 1ft from wall	84dB/w 45Hz (in room)		86
Infinity RS2001 £180	Average Average +	A little coloured and unruly in the treble, the 2001 nevertheless retains the lively dynamic bounce of its predecessor; pity the price has gone up	36.5 x 22.5 x 20cm lightweight stands	87dB/w 50Hz (in room)	R	78
Infinity Reference 10 £149	Average Average	Follows the Infinity tradition in providing an engaging and lively sound from a prettily finished and substantial small bookshelf size model	36 x 23 x 23cm stands in free space	87dB 50Hz (in room)	R	98
Infinity Reference 20 £220	Good Average	Large bookshelf size model is well presented and balanced with good bass control, but somehow lacks convincing cohesion and agility; build was slightly suspect too.	46x27x24cm stands 1-2ft from wa	88dB 27Hz (in room)		102
Infinity Reference 30 £330	Good Good	Drivers from Ref 20 in box from Ref 50 creates a well balanced and extended floorstander at a very competitive price	85 x 26.5 x 25cm clear of walls	87-88d 25Hz (in room)	R	106
Infinity Reference 50 £499	Average Average-	Despite hi-tech drivers, attractive presentation, good bass extension and sensitivity, this three-way floorstander suffers from a forward, coloured sound	86 x 26.5 x 25cm floor in free space	89dB 25Hz (in room)		98
JBL Control 1 Plus £229	Average Average	Sub-miniature with forward midrange and no real bass; highish price partly justified by cute, near-indestructible Pro styling and build	23 x 15.5 x 14cm close to rear wall	89dB/w 50Hz		90
JBL L20T3 £249	Average- Average-	Compact bookshelf model delivers bouncy miniature-type sound when free space mounted; pleasant enough but uneven and undistinguished	39 x 23 x 20.5cm stands free space	87dB/W 48Hz (in room)		94
JBL LX33 £259	Average + Good	A bit of a cheat, but a lot of speaker for the money, which manages a better room balance than many 'large bookshelf' rivals, and delivers a fine acoustic	80 x 25 x 21cm floor, 1ft from wall	89dB/w 48Hz	R	82
JBL LX44 £339	Good - Average	This generously built model offers good power handling, bass extension and dynamic range, but suffers from the 'three-way syndrome', with middle muddle	58.5 x 30 x 29cm stands in free space	89dB/w 40Hz		71
JBL LX55 £350	Good Average	This big bluff three-way provides lots of speaker, bandwidth and loudness for the asking price, but is ultimately a bit of a dinosaur	66x34.5x29cm stands clear of wall	91dB below 20Hz (in room)		102
JBL XE2 £149	Average- Average-	Budget Danish-built 'bookshelf' model has anomalous 'laid back' balance and lacks the genuine JBL spirit	38 x 23 x 23cm stands in free space	88dB 48Hz (in room)		98
JBL XPL 90 £699	Good Average +	Though undoubtedly pretty and very expensively engineered, this elaborate near-miniature didn't really convince our listeners.	39.5 x 24 x 24cm stands in free space	85dB/w 45Hz (in room)		86
JPW AP2 £180	Good Average	Good size bookshelf model offers real wood veneer at a bargain price; performance is cleaner but broadly comparable to P1 Vinyl overall	43.5 x 25.5 x 26cm stands in free space	86dB 45Hz (in room)	R	106
JPW AP3 £225	Good Average +	Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52 x 25 x 29.5cm near wall on stands	90dB/w 57Hz	R	46
JPW Minim £85	Average + Average -	Very civilised but dynamically limited, the Minim is well suited to the smaller room and where limited loudness is acceptable	27.5 x 18 x 19.5cm stands against wall	85dB/w 28Hz (in room)	R	82

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MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	ISSUE
JPW P1 £145	Good Average +	Honest and basically articulate if not very sophisticated, resolution is good but it can sound a little wearing in bright systems or with rough sounding material	44 x 25.9 x 26.1cm free space on stands	89dB/w 60Hz	R	59
JPW P1 Vinyl £135	Good Average	Not particularly pretty, this is still a lot of highly competent loudspeaker for the price, with a safe and middle-of-the-road sound that's unlikely to disappoint.	43.5x25.5x26cm stands 1-2ft from wa	87dB 32Hz (in room)	BB	102
JPW Sonata £115	Good Average +	Well balanced and integrated, this near-miniature offers fine sound if limited bass and dynamic range, plus real tree wood at a nearly silly price	32 x 23 x 20cm stands near rear wall	86dB/w 55Hz	BB	71
JPW Sonata Plus £135	Average Average -	This luxury variation on the redoubtable Sonata theme features a metal dome tweeter, and is not the better for it	32 x 23 x 21cm about 1ft from wall	87dB/w 30Hz		90
JRT AD1 £500 (s)	Average + Good +	A most auspicious Choice debut for relative newcomers JRT. A fair share of cosmetic deficiencies do little to spoil the impressive coherence and timing	59.5 x 28 x 36cm own stands close to rear	86dB/w 28Hz (in room)	R	86
JRT AD1 Micro £389	Average Good	Beautiful bijou miniature has delightful life and coherence and gives surprising impression of scale; some aggressive tendencies but very open to system tuning	28 x 17 x 21cm stands against wall	87dB/W 50Hz (in room)	R	94
Jamo Concert II £250	Good Average -	A thoroughly respectable 'bookshelf' performer that needs free space siting but includes attractive cabinetwork and a neat grille	41 x 24 x 25cm stands in free space	85dB/w 48Hz		66
Jamo Concert V £500	Average Average	Compact, solid, nicely finished floorstander delivers unusually extended bass at the expense of lowish sensitivity; midband is smooth but laid back.	86x24x28cm well clear of walls	85dB below 20Hz (in room)		102
Jamo Concert VII £650	Average+ Average	Beautifully built large floorstander uses unusual double reflex bass system, unsuccessfully as far as low frequency resolution is concerned	96 x 28 x 31.5cm floor, free standing	87dB/W 25Hz (in room)		94
Jamo Cornet 40 £100	Average- Average	Pretty little Danish-built miniature with respectable rather than exceptional sound quality for the price	32 x 20 x 22cm stands 1-2ft from wall	86dB 48Hz (in room)		98
Jordan JH400 £504	Average- Average+	Beautiful piano finish hexagon has single full range driver and controversial sound, with uneven balance but delightful mid coherence	33 x 24 x 30.5cm 1-2ft from wall	83dB 50Hz (in room)	R	106
KEF 104/2 £1,295	Very Good Very Good	A reference point for dynamics, preferred without KUBE, suited to many rooms. Good stereo, high sound level	90 x 28 x 41.5cm floor standing in free spa	92dB/w 50Hz	R	60
KEF K120 £159	Good Average	Physically pretty and sonically competent but undistinguished medium bookshelf size model has good sensitivity but limited extension	34 x 20.5 x 26cm 1ft from wall	87dB 45Hz (in room)		106
KEF Q60 £349	Good Good	Uni-Q co-axial driver provides fine imaging and mid coherence, while magnet decoupling reduces cabinet coloration. Goes loud, bass not entirely convincing	48x25x27cm stands close to wall	90dB 25Hz (in room)	R	102
KEF Q80 £499	Good Average+	Uni-Q floorstander has good stereo and fine midband coherence, but bass lacks extension, drive and resolution	85 x 24.5 x 26.5cm free space	87dB 45Hz (in room)		106
Kammerzelt Reference Mini Monitor	Average+ Good	Lovely miniature has a beguilingly sweet sound with good pace and drive, but scale is restricted and presence a little dulled considering the high price	stands 1-2ft from wall 85dB/W	50Hz (		94
Kenwood LS-770E £260	Good Good	Impressively communicative made-in-Japan large bookshelf size model has fine vigour, scale and dynamics, if not the smoothest sound around	48 x 27 x 25cm stands in free space	89dB 25Hz (in room)	R	106
Lindley New Age £1100	Average - Average +	Attractively different presentation with classy finish, this tall cylindrical floorstander has fine bass extension but a rather uneven overall balance	105 x 23 x 23cm clear of walls	86dB/w 25Hz		90
Linn Helix II £357 (s)	Good Good+	Ku-Stone supported, this is one of the best 'large bookshelf' size models around. Dry, controlled bass and very open, if slightly aggressive balance.	57x24x30cm KuStones 1-2ft from	88dB 33Hz (in room)	R	102
Linn Index II/KuStone £235/£1	Good Good	Combination of stand and speaker looks and sounds very good for the price, with good bass extension and control, fine dynamic range. Clean, clear if a shade slow	44 x 21 x 23.5cm (box only) close to rear	86dB/w 28Hz	BB	90
Linn Kaber LS500 £1098	Average Good +	Discreet wall-mount package trades sensitivity for fine bass extension and midbass performance; can be a little relentless but has prodigious dynamic capabilities	93 x 19 x 28cm floor against rear wall	86dB/w 28Hz (in room)	R	82
Linn Kan II £439	Average + Average +	A niche product for those prepared to tolerate its strong character for the sake of its fine bass performance and near invisibility	30.5 x 18.5 x 16.5cm Kan stands against	82dB/w 35Hz (in room)		78
Linn Nexus LS250 £458	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	89dB/w 60Hz		59
Magneplanar MG1.4 £1090	Good + Good +	Replaces the stalwart MG1c with a revised panel layout. Offers a very crisp and articulate sound, particularly revealing of upper mid vocal details	155 x 8 x 57cm open space	88dB/w 40Hz	R	72
Magneplanar SMGa £688	Average - Average	Tonally 'rich', in the right room it proved a satisfactory musical experience	122 x 48 x 4.5cm on floor clear of wall	85dB/w 56Hz		46
Marantz LD-50DMS £230	Very Good Good	Well behaved larger two-way has fine balance, stereo and integration with good bass extension, albeit with mild boxy, chesty and fizzy effects	106 x 22 x 32cm floor, free space	88dB/w 30Hz (in room)	R	71
Martin Logan CLS II £3998	n/a Very Good	Much improved high resolution design, fussy about system set-up and demanding of ancillaries and software alike. It rewards the efforts though	60 x 28 x 7.5cm open space	86dB/w 45Hz	R	72
Meridian Argent 1 £1,200	Good+ Good+	Beautifully built, finished and shaped but pricey compact has fine bass extension and virtual absence of 'boxiness'; needs a big amplifier	33 x 27(max) x 27(max)cm Slate stan	83dB 28Hz (in room)		98
Meridian Argent 2 £995	Good+ Good	This beautiful but pricey high-tech 'large compact' delivers an extended, smooth and neutral sound with fair speed. Slate Audio stands are almost essential	48.5 x 21 x 29.5cm stands free space	85dB/W 23Hz (in room)		94
Meridian M30 £895	Average + Average	Pricey but easy on the ears and worth considering especially where space is at a premium	38.5 x 18 x 32cm free space on stands	Active 40Hz		46
Mission 760 £100	Good Average +	Smart presentation and an engaging sound, this sensitive budget miniature sounds notably more lively and less boxy than most of its peers	29 x 18 x 20cm stands close to wall	88dB/w 50Hz	BB	90
Mission 761i £150	Good Average	Variation on 760 theme adds an extra main driver for easier amp loading and power handling. Sound was judged slightly inferior to its simpler, cheaper stablemate.	38x19x24cm stands close to wall	88dB 48Hz (in room)		102
Mission 762 £200	Average Average -	Mission's 'bookshelf middleweight' offers high sensitivity and loudness capability, but at the expense of a somewhat untidy and rather 'heavy' sound	50 x 25 x 27cm stand, experiment advised	91dB/w 55Hz		66
Mission 763 £300	Average + Average +	A very artful combination of generous volume and good bass extension at a modest price. Works well in the listening room despite a few rough edges	77 x 25 x 32cm near rear wall	86dB/w 40Hz	BB	68
Mission 764i £480	Good Average	Despite improvements, this large floorstander still lacks low frequency authority, which is probably a function of its comparatively modest price	1ft from wall, freestanding 87dB/W	below		94
Mission 767 £2500	Very Good Very Good	Magnificent and massive part-active monoliths have fine acoustic subtlety and impressive loudness capability, ultimately limited by partnering (Cyrus) electronics	138 x 29 x 43cm floor, flexible	91dB/w <20Hz (in room)	R	81
Mission Cyrus 780 £180	Good Average +	Pricey but very pretty miniature based on Mission 760 but with beefed up box and crossover network to enhance sound quality still further	29 x 18 x 26cm light stands close to wall	88dB/w 50Hz	R	90
Mission Cyrus 781 £250	Average + Good	Properly run in, the pretty little 781 delivers a fast, dynamic and informative sound which more than justifies its price.	43 x 22.5 x 28cm matching stands 1ft	88dB/w 28Hz (in room)	R	86
Mission Cyrus 782 £350 (s)	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
Monitor Audio MA1200 £900	Average Average +	This smooth and civilised slimline floorstanding loudspeaker is well built and nicely presented. But it is also expensive	94 x 20 x 26cm in free space	85dB/w 48Hz		68
Monitor Audio MA1800 £1400	Good Average +	Attractive and beautifully finished, even when ballasted with lead shot the 1800 inclines towards upper bass richness and lacks genuine extension	106 x 22 x 32cm floor, free space	88dB/w 30Hz (in room)		81
Monitor Audio Monitor 11 £330	Average Good	This tall and slim and attractive free space compact has an extra driver to help out in the bass, giving extra urge at some price in delicacy	52 x 20 x 24cm stands free space	87dB/W 48Hz (in room)	R	94

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MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	ISSUE
Monitor Audio Monitor 14 £400	Average Average	Floorstanding version of M11 suffers from excess upper bass, giving a thick, chesty coloration beneath a quite lively and well focused mid and treble	78 x 20 x 24cm floor well clear of walls	86dB 30Hz (in room)		98
Monitor Audio Monitor 7 £180	Average - Average	This lively and punchy near-miniature looks pretty enough and is good value but is let down by an unruly and indifferently integrated tweeter	34 x 16.5 x 17cm stands 1ft from wall	84dB/w 70Hz		74
Monitor Audio Monitor 9 £220	Good Average	Despite a much better treble balance than the 7, the Monitor 9 is less engaging and lively at low frequencies than its smaller sibling	37 x 20 x 21cm high stands near wall	85dB/w 30Hz		78
Monitor Audio Monitor One £180 (rosewood)	Average+ Average+	Pricy but very cute little micro-miniature just about gets away with it sonically, though performance envelope is inevitably limited	24 x 15 x 16cm stands against wall	85dB 55Hz (in room)	R	106
Monitor Audio Studio 10 £1200	Average Average +	Expensive, luxury build/finish and all-metal driver diaphragms provide engagingly transparent midrange and treble, spoiled by over-strong mid-bass.	40 x 20 x 25cm heavy stands clear of wall	87dB/w 45Hz		90
Monitor Audio Studio 15 £1,600	Average+ Good	A little slow and lazy but better balanced than the smaller Studio models, the midband coherence and focus is superb, but it ain't cheap	51x20x26cm free space	87dB 45Hz (in room)	R	102
Monitor Audio Studio 5 £500	Average+ Average+	All metal diaphragm luxury miniature has splendid presence coherence but sound can be aggressive and lacks welly.	32 x 18 x 20cm stands close to wall	83dB 28Hz (in room)		98
Mordaunt-Short 5-30 £200	Average+ Average-	Good hi-tech material value for money, but a disappointingly dull and rather bland sound. Safe but uninspiring.	42.5 x 25 x 28cm stands clear of walls	86dB 28Hz (in room)		106
Mordaunt-Short Classic 20 £395	Average+ Average+	Luxuriously finished compact delivers beguiling mid transparency but bass is altogether less convincing — one for the carpet slippers generation perhaps	37x22x27cm stands in free space	86dB 45Hz (in room)		102
Mordaunt-Short MS3.10 £110	Average Average+	Probably the liveliest and most communicative miniature around, this beautifully presented design is probably better suited to budget 'real hi-fi'	28.5x17.5x20cm stands in free space	88.5dB 48Hz (in room)		78
Mordaunt-Short MS3.20 £140	Average Average+	All the charm of its BB rated £99 baby 3.10 brother, plus a smidgeon more bass for those in a suggestible frame of mind	35.5x18x20cm stands against wall	85dB/w 50Hz (in room)	R	82
Mordaunt-Short MS3.30 £200	Average Average+	A little too mid-forward for neutrality or formal recommendation this attractive, good sized model nevertheless has more than enough appealing qualities	46x23.5x27cm stands 1-2ft from wall	87dB 38Hz (in room)		78
Mordaunt-Short MS3.40 £260	Average+ Average	It looks pretty and sound civilised but the 3.40 failed to ignite any degree of enthusiasm amongst our listeners. LF room matching is critical	57x23.5x27.5cm stands in free space	87dB 30Hz (in room)		86
NAD 8100 £300	Average+ Average+	Floorstanding variation on attractive 8225 miniature adds some half convincing extra bass thump and saves the price of stands - very cost effective	75 x 20 x 25cm floor clear of walls	88dB 25Hz (in room)	R	98
NAD 8225 £150	Good Average +	Notwithstanding lacklustre styling and an unprepossessing appearance, this NAD miniature has a smooth and even midband plus an appealing overall jauntiness.	34 x 20 x 18cm stands close to wall	87dB/w 45Hz (in room)	R	86
NVA Cube 1 £600 (s)	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 wa	85dB/w 52Hz	R	71
NVA Cube 2 £380	Average Good	A rude but exciting miniature, with unusually accomplished bass capabilities for its size	28.5 x 27 x 28.5cm NVA stands against wall	85dB/w 48Hz (in room)	R	82
NVA Cubix £1100	Average Good	Too idiosyncratic for formal recommendation, the Cubix possesses remarkable bass extension for its size, but is tricky to optimise	60 x 32.5 x 32.5cm	84dB/w 28Hz (in room)		78
Naim NA IBL £798	Average+ Good	This tiny and elaborately engineered floorstanding wall mount delivers outstanding dynamics, speed and detail, marred by pronounced upper mid forwardness	wall, freestanding 84dB/W	30Hz (		94
Naim SBL £1,527	Good Very Good	Impressive scale and full bandwidth coherence from an attractively discrete floor standing wall-mount — coloured midband but very well balanced and agile with it.	88x26.5x17-27cm close to wall	86dB 25Hz (in room)	R	102
Neat Petite £525	Average Good+	Pricy and far from perfect, this near miniature is nevertheless one of the most entertaining and enjoyable speakers around, colorations notwithstanding.	30.5x20x18cm stands close to wall	86dB 33Hz (in room)	R	102
Opus 3 Capella £599	Good Good	The sound of this Scandinavian curiosity certainly benefits from the crushed marble enclosure, though presentation is strictly DIY	32 x 40.5 x 26(ave)cm amongst books in	86.5dB 45Hz		66
Opus 3 Credo £399	Average Average	Credo's odd-shaped silicate-based cabinet confers good box and bass performance, but the sound could be more neutral for the price	32 x 28 x 32cm stands in free space	88dB/w 65Hz		74
Origin Live OL1 £499	Very Good Good	Luxury miniature has very good overall balance, sacrificing sensitivity to achieve remarkable bass extension for the box size	30.5 x 19 x 21cm stands close to wall	82dB 25Hz (in room)		106
Pearl & Oakley Victoria 200 £1099	Average - Average -	Extraordinary — and to many very attractive — 'ginger jar' presentation in Staffordshire ceramics, but let down by need for further acoustic development	93 x 33 x 33cm on floor in free space	87dB/w 30Hz (in room)		78
Philips FB815 £250	Average Average	An impressively — indeed imposing — physical package for the price, clever engineering gives a very competent if slightly hard and brittle sound quality	63 x 27 x 27cm low stands in free space	85dB/w 30Hz		86
Philips FB820 £450	Good Average	Big-but-less-than-beautiful three-way is well enough balanced but lacks communication skills in the time domain	86 x 27 x 35cm floor clear of walls	87dB 28Hz (in room)		98
Philips FB825 £650	Good Good	Generous sounding and impressively uncongested for the type, loudness and bass extension don't quite match the large and rather plasticky box	110 x 29 x 41cm on cones clear of walls	88dB/w 25Hz	R	90
QLN Model One £700	Good Average	Similar to Signature at two thirds the price, Model One exaggerates the latter's rich and heavy midbass and lacks its velvet smoothness	35 x (16-25) x (21-27)cm pillar	85dB/w 28Hz (in room)		82
QLN Signature £1100	Good Good	Beautiful but expensive luxury compact has a rather laid back and 'heavy' sound, but coloration is low and stereo imaging very good	37 x 18 x 36cm heavy stands in free space	83dB/w 30Hz (in room)		78
Quad ESL-63 £2072	Good + Very Good	With its unusual but subtle characteristics this classic electrostatic may not be punchy in the bass, but has strengths that some cannot live without	92 x 66 x 27cm open stand well clear of	84dB/w 34Hz	R	60
RAM Hermes £425	Average- Average+	Slim small floorstander is a bit tall for its footprint. Good sensitivity is combined with an attractively lively sound, but it's uneven and not truly coherent	70 x 21.5 x 23cm floor, freestanding	91dB/W 45Hz (in room)		94
RCF Mytho 3 £1,395	Average Average+	Undoubtedly very attractive and well built, incorporating a number of unusual and interesting ideas, the highish price isn't really justified by the performance.	100x21.5x30cm away from walls	88dB 25Hz (in room)		102
Richard Allan CD5 £184	Average - Average -	This neatly presented small reflex design can sound engagingly communicative, but is flawed sonically and technically and quite expensive too	38 x 19 x 23cm on rigid stands	88dB/w 80Hz		68
Rogers LS2a/2 £209	Good+ Good	Balance is a bit warm and rich but 2a/2 has delightful mid-to-treble coherence and transparency, and more welly than Mk1	35.5 x 23 x 22cm stands clear of walls	84-85d 30Hz (in room)	BB	106
Rogers LS8a £425	Average + Average +	This modestly priced floorstander is a mixed bag, with plenty of scale and welly but lacking the subtlety, clarity and agility delivered by some rivals	89x25.5x25cm clear of walls	91dB 30Hz (in room)		102
Rogers Studio 1a £599	Very Good Good -	The classic BBC monitor style sound sensitively updated — transparent and natural with fine stereo, but a touch 'heavy' in balance	63.5 x 30.5 x 30.5cm stands in free space	87dB/w 36Hz	R	66
Roksan Darius £1569 (	Good Very Good	Now totally realigned, the current Darius provides an exceptionally impressive combination of transparency and delicacy with fine information retrieval and speed	47 x 27 x 40cm own stands angled in spa	82dB/w 20Hz	R	86
Royd A14 II £199	Average Good	Not the smoothest or prettiest around, this is still an informative if sometimes aggressive large bookshelf model, with plenty of welly for the price	40 x 26 x 23cm stands 1ft from wall	87dB/W 30Hz (in room)	R	94
Royd A7 Series 11 £115	Average + Average	Lively clear sound; good upper bass and dynamics, but treble "ramp" made vocals sound shut in. Try before you buy	31 x 20 x 17cm shelf or 50cm stands near	86dB/w 75Hz	R	53
Royd Apex £485	Average + Good	Not the smoothest sound around, it more than compensates with an impressively communicative and informative musical presentation	85.5 x 20 x 30cm on floor close to wall	87dB/w 33Hz (in room)	R	78
Royd Eden £235	Average Average +	Delightful mid/treble speed and transparency but determinedly bass light, this oddball miniature threatens cult status but could use a sweeter tweeter	31 x 20.5 x 18.5cm stands close to wall	87dB/w 85Hz	R	66

The Directory

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	ISSUE
Royd Sapphire £200	Average+ Good-	Neat little miniature sounds a touch cold and thin but unusual main driver delivers remarkable speed and coherence for such a reasonably priced model	30.5 x 20.5 x 21cm frame stands 1ft fro	88dB 28Hz (in room)	R	98
Royd Sintra £330	Average + Good	Balance is bass light and a little bright, but superb dynamics, speed and timing make this luxury miniature musically very informative and satisfying	30.5 x 20.5 x 19cm stands close to wall	88dB/w 50Hz	R	90
Ruark Swordsman £219	Good Average	Very attractively styled and finished, the Swordsman is a well built 'small bookshelf' model that delivered better test than listening results	38.5 x 20 x 27.5cm stands 0.5m from wal	84dB/w 50Hz		71
Ruark Swordsman Plus £269	Good Average	This real wood variation on the established Swordsman theme looks and measures rather better than it sounds, probably due to rather prosaic drivers	38 x 20 x 28cm stands 1-2ft from wall	84dB 27Hz (in room)		98
Ruark Talisman £629	Average Good	Clever and beautifully finished compact floorstander has some coloration but is impressively informative and communicative, with fine pace and timing	83.5 x 21.5 x 31 (max) cm close to rear wal	86dB/w 30Hz	R	90
SD Acoustics OBS £845	Average Good	Recent changes have added some refinement to a seductive midrange, good timing and fine sensitivity, though bass extension is limited and coloration obvious	102 x 35 x 25cm floor, angled, away from	92dB/w 30Hz (in room)	R	82
SD Acoustics Ribbon £2150	Average Good +	Entertaining but a little underdeveloped and rather amplifier sensitive, the Ribbon is a lively and loud hybrid marred by some colorations; some like it, others don't	152 x 30 x (15-30)cm floor, angled, away	91dB/w 30Hz (in room)		81
SD Acoustics SD1 £1350	Average Very Good	A large scale, airy and unusually detailed system with excellent dynamics. Current model has more civilised top-end and warmer balance than original model	123.5 x 38.2 x 31.9cm free space	90dB/w 50Hz	R	60
SD Acoustics SD3 £379	Average Good	Neither cheap nor perfect, this near miniature sounds unusually lively and dynamic within inevitable physica constraints. Both engaging and entertaining!	38 x 19 x 29cm stands 10cm from wall	83dB/w	R	86
SD Acoustics SD3 £399	Good Good	Port firmly blocked, the new SD3 has the agility and charm of a quality miniature, with good bass extension but low sensitivity	38 x 19.5 x 29cm stands 1ft from wal	83dB 25Hz (in room)	R	106
Seventh Veil System IV £1290 (	Average Good +	Lacks welly and loudness but delivers astonishing results with female vocals in particular. Antithesis of the 'good allrounder'	72 x 44 x 21 x 29cm own-stands close to	84dB/w 28Hz (in room)	R	86
Shan Shimna £315	Average+ Good-	Pretty little miniature with resin-based enclosure has a bright, thin but sweet and communicative sound; loudness and welly are both limited	31 x 21 x 17cm own stands 1ft from wal	84dB 48Hz (in room)	R	98
Sony APM-101ES £100	Good Average	Big hearted sound from small bookshelf successor to BB '10ES, sounds a little untidy at frequency extremes, so suits CD better than vinyl	39.5 x 22.5 x 23.5cm stands, free space	86dB/w 52Hz	R	71
Sony APM-121ES £150	Average Average -	Good perceived high tech value, but the balance has an artificial 'loudness' character, too rich in the bass and too strong in the treble	43 x 25 x 28cm stands, free space	86dB/w 25Hz (in room)		86
Sony APM-141ES £200	Average Average	A great deal of loudspeaker for the money, the rich sounding '141 needs a big room and still shows significant 'loudness' (boom'n'tizz) tendencies	61.5 x 26 x 32cm stands in plenty of	88dB/w 30Hz (in room)	R	78
Sony APM-181ES £300	Very Good Average	Big and beefy but equally fat and bass heavy, this well engineered 3-way has notable strengths but lacks transparency and sounds better at lower levels	57.5 x 29 x 36cm low stands, free space	87dB/w 40Hz		71
Spendor S20 £510	Very Good Good	This solid and elegant luxury compact maintains Spendor's tradition for peerless mid-to-treble coherence and perspectives. Bass is rather unconvincing.	38x22x26cm stands 1-2ft from wa	83dB 25Hz (in room)	R	102
Spica Angelus £1295	Good Average	A little bass shy and soft in the bass and lower mid, the free standing Angelus is otherwise tidy, extremely lively and fluid, if uneven overall	116.8 x 53.3 x 26cm away from walls	86.5dB 50Hz		60
Spica TC50 £599	Good - Good	This triangular-profile 'grown up' miniature is a shade boxy and laid back but has good rhythmic and musical integrity	40.5 x 33 x 29cm stands in open space	88dB/w 55Hz		71
Spica TC50SE £799	Good - Good	A heavily UK-modified TC50, the SE sounds less boxy and more spacious, but lacks some of the urgency of the standard model	40.5 x 33 x 29cm stands in open space	88dB/w 55Hz		71
Studio Power DMS100 £249	Average + Average +	Close to a BB rating, and in many respects remarkable value for money. Delivers an impressively smooth and large sound, but sheer ugliness will limit its appeal	51 x 26 x 32cm open stands 1ft from wall	86dB/w 25Hz (in room)	R	82
TDL Monitor £1799	Very Good Very Good	Fine solidity and good accuracy, with enough bass extension to satisfy even organ freaks. Needs a big room and can sound a bit lazy and a shade tinkly	118.5 x 30 x 47cm 0.5m from walls	85dB/w 28Hz	R	66
TDL Studio 0.5 £399	Average Good	This tiny floorstanding transmission line has good agility but doesn't provide the coherence or even balance of the slightly bigger Studio 1	55 x 20 x 30cm own stand, free space	85dB/W 40Hz (in room)		94
TDL Studio 1 £599	Average + Good	Delivering genuinely extended bass from a compact floorstanding enclosure, the Studio is very detailed but a shade clinical and detached in presentation	76 x 23 x 33cm	84dB/w 25Hz (in room)	R	78
Tannoy 603 £120	Average+ Average+	Pretty hexagonal cabinet miniature is optimised for free space siting and delivers fine imaging with little boxiness, but little in the way of welly and power either.	33.5x22(max)x16cm high stands in free	85dB 45Hz (in room)	R	102
Tannoy 605 £150	Good Average+	Largish bookshelf size hexagon is potentially fine performer, though unusual stand sensitivity makes optimisation difficult	40 x 27.5 x 18cm stands 1-2ft from wall	85dB 25Hz (in room)	R	106
Tannoy 609 £250	Good Good	Distinctive hexagonal cabinet reduces box colorations, and new dual concentric driver is sweeter than its predecessors, making this one very superior speaker	50x32(max)x22cm stands clear of wall	90dB 25Hz (in room)	BB	102
Tannoy Westminster £3600	n/a Good +	These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge, flat against rear wall, away from	96dB/w	R	Coll '87
Technics SB-EX2 £180	Average- Average	Nicely presented, well built and decent size enclosure sounds solid but somewhat dull, thanks presumably to rather ordinary, low cost drivers	48 x 23.5 x 27cm stands clear of wall	86dB 20Hz (in room)		98
Technics SB-RX50 £650	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
Townshend Glastonbury IIS* £1700	n/a Very Good	What? No bass? Actually, like the KEF 107, Glastonbury II goes down so low you might not notice how good it is. A truly remarkable performer. Superb	91.5 x 28 x 4 6 free standing in room	88dB 27Hz	R	65
Townshend Glastonbury Tor £1495	Average - Very Good	Prodigious bass extension, stunning stereo focus and low cabinet coloration, but limited loudness from low sensitivity and power handling	99 x 26.5 x 33cm well clear of walls	82dB/w below 20Hz	R	90
Vandersteen Model One £1000	Average + Average +	This compact American floorstander's elegant staggered baffle arrangement contributes to a refreshing freedom from boxiness, but the price is quite high	100 x 30.7 x 25.6cm floor clear of walls	87dB/w 23Hz (in room)		86
Vecteur Premiere £695	Average Good	Expensive for its material content, this pretty French compact nevertheless has a beguiling sound quality that indicates painstaking development	34 x 19.5 x 25cm light stands clear of wall	88dB 48Hz (in room)		98
Wharfedale 410 £130	Good Average-	One step up from the Diamond, this attractive and sensitive small bookshelf model sounds smoother but is also rather bland and uninvolving	34.5 x 22 x 22.5cm stand against wall	89dB/W 45Hz (in room)		94
Wharfedale 505.2M £260	Average+ Good-	Luxury red mahogany finish version of 505.2, confirms that this well balanced design remains fully competitive nearly three years after the original	44 x 25.5 x 25.5cm stands in free space	87dB 45Hz (in room)	R	98
Wharfedale 505/2 £190	Average Good	This lively Wharfedale provides plenty of speaker with unusual refinement for the money, and should be fairly tolerant of room siting	44 x 25.5 x 24cm stands 1ft from wall	86dB/w 55Hz	BB	66
Wharfedale 515 £260	Good Good		40 x 25.5 x 30cm stands clear of walls	85dB 28Hz (in room)	R	106
Wharfedale Coleridge C £600	Good Good	Very prettily dressed and sounds pretty good as well, though whether enough to justify the £600 pricetag is open to debate. Well balanced, smooth and a little dull.	48x25.5x25.5cm stands clear of wall	86dB 30Hz (in room)		102
Wharfedale Delta 30.2 £100	Average- Average	This hundred pounder has a bigger main driver than many of its rivals, and so packs a bit more welly and loudness. Coloration is rather obvious, but timing is good	38 x 22 x 17cm stands close to wall	88dB 48Hz (in room)	BB	98
Wharfedale Diamond IV £109	Good Average +	Thanks to a new metal dome tweeter, the new Diamond is much more civilised than its predecessors, with an attractive lively bounce but some boxiness	27 x 18 x 18.5cm stands close to wall	86dB/w 48Hz	R	90
Yamaha NS 1000M £900	Good Good +	Living up to its monitor label, and tonally well suited to digital material, the NS 1000M is superbly crafted and capable of high levels	67.5 x 37.5 x 32.5cm 30cm from wall, stan	90dB/w 40Hz	R	46

LOUDSPEAKERS - SATELLITE AND SUBWOOFER SYSTEMS

Satellite and subwoofer systems, sometimes referred to as three way systems, consist of a small pair of speakers (the satellites) and an extra box (or two) to handle the low frequencies.

Most systems use a single sub-woofer to supply low bass output, although stereo sub-woofer systems are available. By freeing the main speakers of the necessity of generating deep bass they can be made much smaller than a standard design and as a result satellite

and subwoofer systems are usually visually unobtrusive.

Positioning of the sub-woofer is usually not as critical as the positioning of a conventional speaker and as a result the largest part of the system can be hidden away entirely, although please refer to the placement notes below as this does not apply to every system.

In general the sonic performance of these systems will fall below the performance of a good, comparably priced, conventional speaker.

The value ratings given below are judged in the context of sat and sub woofer systems only and are not judged by the same criteria as the main loudspeakers, thus a Recommended sat and sub system probably won't sound as good as a Recommended traditional speaker.

If you are prepared to compromise slightly in terms of sound quality then a satellite and sub-woofer system might represent a good solution for those situations where the loudspeaker should be heard but not seen.

LOUDSPEAKERS - SATELLITE AND SUBWOOFER SYSTEMS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE (cm) PLACEMENT	SENSITIVITY BASS FROM	VALUE	ISSUE
Allison MS 205 £420	Average Good -	Tasty high quality satellites give this quite pricey 3-box system a touch of class. Subwoofer is very compact and only slightly boomy.	25.5x14.5x15 + 29x 29x36 stands close to wall	86dB 30Hz	R	104
Bose Acoustimass AM3 £289	Average Average	Ultra compact 3-box is well balanced though limited in loudness and bass. Tiny satellites are a bit fierce, and grilles unhelpful	9x11x11 + 20x37x19 close to wall	85dB 48Hz		104
Bose Acoustimass AM5 £569	Average + Average +	Pricey but cleverly engineered 3-box system is well balanced and uses tiny twin-driver satellites to good effect	16x7.7x12 + 36x19x48 sats at wall, sub 2ft from wall	85dB 40Hz	R	104
Heco Libero £375	Average Average	Attractive 3-box package uses neat metal satellites with versatile mounting accessories, but subwoofer is boomy in the midbass	18x11x12 + 21x55x 31.5 uncritical	85dB 45Hz		104
Jamo SW/SAT300 £300	Average Average	Attractively finished 3-box package has 'tenable' subwoofer that allows boom to be minimised and a good balance achieved	21x15x8 + 21x48x34.5 uncritical	85dB 40Hz	R	104
RSS Solid/Bass Station £550	Average Average	Multi-driver macho subwoofer adds mucho muscle to Solid satellites, but it's much more midbass than serious extension	24x12x12 + 47x 4x x 20 sub at wall, sats in free space	91dB 45Hz		104
Wharfedale 2130 £300	Average Average +	3-box system marred by indifferent boomy subwoofer but rescued by novel wide-dispersion satellites that give an open sound	14x24x11 + 19x32x 50 sub away from wall	86dB 48Hz	R	104

PERSONAL STEREOS

Whilst not exactly hi-fi components, personal stereos probably play more music to more ears than all manner of domestic systems and as such demand some attention.

Now that personal CD players have joined the ubiquitous Walkman in the market, the variety and standard of sound quality is huge, with obscurely named cassette players practically falling out of your cornflakes packet and the top Discmen going for £300 or more.

Despite their diminutive size personals attempt to incorporate as many gimmicks and features as possible, cassette players often incorporating tuners, Dolby noise reduction or

even graphic equalisers.

CD players are don't tend to vary that much on the features front, rather the amount and quality of accessories differs. Rechargeable batteries are extremely useful and increasingly popular, some can now be recharged within the unit and charge capacities are also being increased. Most models come with a mains adaptor, which in some cases doubles as a battery charger and some include a wired remote control. A few are now appearing with infra-red remote control.

Sound quality on the cassette front seems to have a proportional relationship to price and

integrity of construction – wow and flutter being quite obvious on the cheaper models.

CD players become less noisy as they get dearer and also reduce in size; one drawback of the latter seems to be that immunity to shock suffers as a consequence, although newer models are starting to buck this trend. Cassette players do, on the whole, seem better suited to the outdoor life than their digital counterparts, as does the software. Bear in mind that the sound and lab ratings given below cannot realistically be compared to those in other categories or between cassette and CD personals

PERSONAL CASSETTES

MODEL PRICE	SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa HS P505MkII £70	Good	Very good clutch of features and accessories plus good sound at a reasonable price. Could be more user friendly	Remote control, rechargeable battery and charger	BB	102
Aiwa HS-PL707 £135	Very Good-	Has a precise, attractive sound, if a little clinical and cold. This player might be ideal for the user who will listen to mostly classical music. Somewhat fiddly to use	Remote control, BBE sound enhancer, charger & battery	R	102
Aiwa HS-JX705 £220	Good	Rather expensive radio-equipped player. Sound quality on tape playback didn't match up to the Aiwa HS-PL707	FM/AM tuner, recording mic remote control, charger		102
Panasonic RQS15 £85	Good	Considerable power and immediacy to the music though with some raggedness. Good features and accessories. Well designed and easy to use	Remote control, rechargeable battery and charger	R	102
Panasonic RQV520 £100	Good	Features an onboard radio without sacrificing sound quality on tape playback. You lose out on accessories, though (no battery charger)	Radio, remote control, bass enhancer		102
Panasonic RQS65 £130	Good+	Solid, warm sound plus a good selection of features and accessories all combined in a stylish and very user friendly package. Comes with one of the better remote controls	Remote control, rechargeable battery and charger	R	102
Sanyo MGR401D £40	Average-	Easy to use budget model with a radio and some useful features (including a simplified remote control). Sound quality on tape isn't great but is helped by the bass enhancer	Radio, remote control, bass enhancer with graphic equaliser		102
Sanyo MGR580 £50	Poor	A more sophisticated radio than on Sanyo's 401D but the feature count is low and the tape playback unexceptional	Radio 'digital tuner', auto reverse		102
Sanyo SPT1000 £40	Average	Despite outlandish colourful trim and features completely unrelated to audio enjoyment (a 'Pedometer' for monitoring jogging) this has a better basic sound than the other Sanyos	Bass enhancer		102
Sharp JC-510 £30	Average	Serviceable sound quality and some decent features at a low price	Radio, bass enhancer, auto reverse		102
Sharp JC-K99 £160	Good-	Sharp's 'extremely lightweight' model. Well made, elegant and it certainly doesn't weigh a lot. Pleasant sound, marred on the test sample by some distortion	Remote, rechargeable battery and charger, bass enhancer		102
Sony WM DD33 £90	Good-	Well built and resistant to vibration on the move but comes with very limited features and accessories for the price	Bass enhancer		102
Sony WM EX80 £150	Good	User friendly Sony with a good remote control and high quality, accurate sound. Comes with all the extras	Remote control, rechargeable battery and charger	R	102
Sony WM DD99 £240	Good-	Mixed bag of accessories (nice headphone storage system, but no remote control) with variable sound quality at a steep price. But it does have Dolby B&C, good build quality and ergonomics	Dolby B&C, rechargeable battery and charger, auto reverse		102
Sony Walkman Pro £249	Very Good	One of the finest sounding cassette decks on the market today. A mandatory Best Buy, it takes other personals to the cleaners (except on weight and power consumption)	Dolby B, C, types I, II & IV, record, line in/out, varispeed	BB	52/56

PERSONAL CDS

MODEL PRICE	SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa XP-6 £150	Good	Punchy sound both via headphones and when used in a system but transport lets the side down a bit - not one to take out jogging	Digital output, mains adaptor, remote, headphones	R	106
Denon DCP-100 £250	Good	Solidly constructed and nicely finished in the slightly impractical Velvex, almost walkable, competent if uninspiring sound quality	Remote, mains adaptor, no earphones, rechargeable batts		94 Supp.
Denon DCP-50 £180	Average +	Not very walkable, but lightweight and nicely finished in a nextel like grey. Sound through a system is a tad unexciting but not too bad	No headphones, remote, mains adaptor		94 Supp.
Goodmans GCD-10 £120	Average -	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	Mains adaptor, headphones		66
Kenwood DPC-41 £130	Average -	Lightweight, not very walkable but nice control layout. Sound through the phones is on the thin side, through the line output it's pretty average for a portable	Mains adaptor, rechargeable batts headphones		94 Supp.
Kenwood DPC-81 £200	Good +	Chunky metal cased player that makes pretty confident sounds through a system but sounds dry via earphones and ain't exactly walkable	Remote control, mains charger and batts, digital output		94 Supp.
Philips AZ6897 £200	Good +	Unusually designed and equipped with a radio the Philips is almost joggable, it sounds remarkably good via a system and a little cautious through the phones	Mains adaptor with built in plug, wired remote, clock, headphones	BB	94 Supp.
Philips AZ6819 £300	Excellent	Unusual looking machine with interesting radio headphones. Excellent sound quality but not one to walk with, superb styling	Radio headphones, rechargeables, infra-red remote	BB	106
Samsung MY-CD2 £110	Poor	Cheap and not particularly cheerful, minimum of facilities and naff sound quality, could suit those on a very tight budget	Headphones, mains adaptor		106
Sanyo CP-12 £260	Good +	Sonically amongst the more enjoyable CD players and capable of revealing the musical aspects of a disc in an interesting and entertaining fashion	Wired remote, headphones main adaptor	R	66
Sony D-11 £135	Average -	Chunky player with old fashioned styling, a rather lightweight sound and limited dynamic range.	Headphones, AC adaptor bass boost		106
Sony D-202 £160	Average +	Good sound quality twinned with relatively good portability accounts for the recommendation, can also sound OK in a main system. Nice entry level machine	Headphones, AC adaptor rechargeables, remote, digital out	R	106
Sony D-303 £280	Excellent	Tidy design with adequate features but not as cluttered as the D-350. Excellent sound quality and will even serve as a CD transport	Headphones, AC adaptor rechargeables, remote, digital out	BB	106
Sony D-350 £300	Good	More buttons and widgets than any of the others but not the sound quality or walkability to go with it	Mains adaptor, clock, rechargeable batteries		94 Supp.
Sony D-66 £180	Average +	One of the few walkable CD players on the market, sound quality is a little muddled but not offensive	Mains adaptor, rechargeable battery pack	R	94 Supp.
Technics SL-XP1 £140	Good +	Remarkably competent and enjoyable player that you can actually use on the move and sounds enthusiastic through a domestic system	Rechargeable batts, mains adaptor/charger, headphones	BB	94 Supp.
Technics SL-XP505 £180	Average -	Excellent transport makes this one of the most stable players on the market and the infra-red remote control is a nice bonus. Sound quality leaves a little to be desired	Headphones, AC adaptor rechargeables, infra-red remote		106
Technics SL-XPS900 £280	Excellent	Great sound quality both via phones and in the home backed up with an impressive array of accessories. Transport is not up to use on the move	Headphones, AC adaptor rechargeables, infra-red remote	R	106

TUNERS

The radio medium operates at a much lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live Prom concerts can rival all other sources from a hi-fi perspective. Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen amplifier

cosmetically. However, the task they carry out is far from simple (or cheap), combining the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on local reception conditions, but money invested in a high quality outside aerial system is well spent.

Tuners come in two basic types. Analogue models tune gradually (and usually manually)

acrossthe 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.)

TUNERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Aiwa XT-003 £105	Average Average-	Economically designed and built in the UK, but trade-offs have a marked influence on FM and AM sound quality.	FM/AM digital, 30 presets, no signal strength meters.		93 Supp.
Akai AT-52L £150	Very Good Very Good	Holds its own on FM against many much more expensive tuners, but AM is very poor	All bands	BB	65
Akai AT-93L £250	Good + Good +	By AM standards presentable (good) while FM delivers the goods	All bands, aerial switch	R	65
Arcam Alpha 2 £185	Good Average+	Re-styled to blend in with the Alpha system, Arcam's cheapest tuner makes up for its lack of features with a sensitive front-end and mellow sound.	FM/AM analogue, no presets, manual tuning + AFC	R	93 Supp.
Arcam Delta 80 £340	Very Good Very Good	Hi-fi sound on FM, good on AM, a dependable British all-rounder	6AM, 6FM presets. FM/MW/LW display, manual tune	BB	55
Creek T40s3 £220	Average+ Average	Creek's FM-only analogue tuner is now in series 3 form, though the aesthetics remain unchanged. Ours was hampered by an obvious bass 'hump' though production units are said to be cured.	FM-only analogue, no presets, manual tuning + AFC		93 Supp.
Denon TU-260L £100	Very Good Good+	A new cheapie from Denon with the bare minimum of features. Careful designwork promises a surprisingly open and vivacious sound, so don't overlook it!	FM/AM digital, 20 presets, manual and auto tuning.	BB	93 Supp.
Harman Kardon Citation 23 £600	Good Very Good	Fine performance, interesting features and ease of use are this tuner's forté, and the sound quality is top notch	FM/AM seek/manual adjustment muting 16 presets remote control	R	60
Harman Kardon TU9400 £250	Good Very Good	Striking in appearance and with a sound to match, this new digital tuner comfortably exceeded our expectations. On stereo FM it's HK's best yet.	FM/AM digital, 24 presets, auto-tuning, signal strength meter	R	93 Supp.
Linx Theta £475	Good Very Good	A Magnum Dynalab on the cheap with the hallmark styling of this small British newcomer. Some of the best midrange from any tuner	Manual analogue tuning, no presets, signal strength meter	R	72
Magnum Dynalab FT101 £599	Good Very Good	Although expensive for its fairly minimum set of facilities, its excellent sound makes up for what it lacks elsewhere	Analogue manual tuning, no presets, signal strength meter	R	72
Marantz ST-40L £140	Average + Good	A little slow to tune but once accomplished it provides a meaty and dynamic sound on FM. AM too has a little extra bite to its performance	FM/AM digital, 30 presets, manual/auto tuning		93 Supp.
Meridian 204 £660	Good + Good	Pleasant sounding with a fine finish but does not make the grade at this price	FM only, auto scan, digital, remote, timer		55

TUNERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Naim NAT 01 £1377	Very Good Excellent	There may be better sounding tuners in the world, but we have yet to hear one	No presets. Two box, flywheel tuning, FM only. Analogue	R	50
Nakamichi ST-7E £750	Good + Good +	Exceptionally good for weak-signal areas, and good all round	16 AM/FM presets, auto time digital		55
Pioneer F91 £360	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 £399	Very Good Good +	Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7 presets. Digital	R	50
Revox B260 £1120	Excellent Very Good	Sophisticated and expensive, the B260 is ideally suited to the rest of the Revox range and should also work well in other systems	FM - virtually everything	R	60
SAE T-102 £449	Good + Good +	Expensive for all the radio you get, but sounds interesting. AM - poor	FM/MW only	R	65
Sony ST-S530ES £200	Good+ Good	The cheaper version of Sony's revered '730 certainly looks and feels the part but its sound is, well, less startling. Civilised, yes, but lacks much enthusiasm.	FM/AM digital, 30 presets, hi-blend + Cal tone + manual/auto		93 Supp.
Technics ST-G70L £200	Good+ Good+	Another very polite and refined-sounding tuner but one that does retain just enough sparkle to keep your interest. Plenty of widgets to play with too...	FM/AM digital, 39 presets, selectable RF/IF + fine tuning, signal. str. mtr.	R	93 Supp.

TURNABLES - 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.

TURNABLES - CARTRIDGES

MODEL PRICE	LAB SOUND	COMMENTS	ARM EFFECTIVE MASS OUTPUT/TYPE	VALUE	ISSUE
Arcam C77 £22	Average + Average +	A sensible moving magnet package with good bounce at a competitive price	6-16g Normal, MM	BB	48
Arcam C77Mg £30	Average - Average	Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8g Normal, MM	BB	67
Arcam E77Mg £50	Average Average	Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8gN Normal, MM	R	48
Arcam P77Mg £60	Average + Average +	Cautiously recommended, the P77Mg was preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9g Normal, MM	R	48
Arcam PMX10 £100	Good + Very Good	Not the very clearest in complex high-frequency sounds, but lively and exciting, good transients	5-11g Low, MC	R	85
Audio Note 102VDH £1295	Good Very Good	One of the best, giving 'an extraordinarily relaxing midrange clarity', needs a transformer	8-18g Very low, MC	R	43
Audio-Technica ART1 £800	Good + Very Good	This is a delicate and very fluid-sounding MC that tracks well, offers very low distortion and exceptionally good stereo separation	9-18g Low, MC	R	72
Audio-Technica AT-420E £35	Average Average	Better suited to pop recordings, this MM bears some of the sonic hallmarks of the Linn K5	7-14g (damp) Normal, MM	R	67
Audio-Technica AT-95E £19	Average - Average	Clear, dynamic if richly balanced, the magnetic '95E is a definite Best Buy	8-14g Normal, MM	BB	48
Audio-Technica OC-10 £307	Good + Good +	Good treble and good detail too, but some congestion and coloration reduces its informativeness.	4-12g Low/MC	R	103
Audio-Technica OC-5 £123	Good + Good	For the price, it's unusually effortless and detailed, but it tends to become rather relentless and tiring after a while.	5-14g Low/MC	R	103
Audioquest AQ 404i-L £400	Very Good Good +	Slight harshness detracted from the performance of this otherwise clear-sounding and detailed cartridge	8-16g Low, MC		84
Audioquest AQ 7000 £1200	Good Good +	Stunning stereo imaging and good detail at low levels are spoiled by less-than-perfect tracking and high sensitivity to arms.	6-20g Low, MC		91
Audioquest MC5 £220	Average Average	Offers high-output benefits but the drooping frequency response and severe VTA error preclude recommendation	10-20g Normal, MC		54
Cello Chorale £750	Average + Good	Now available through a new distributor at a saving of some £300, the Chorale is still blessed with a delicate but highly detailed treble. Arm matching is a problem	3-9g Low, MC		72
Denon DL103 £99	Good Average +	An oldie but in many ways a goodie, the 103's good performance in bass and general 'life' is seriously let down by its spherical stylus which kills subtle details.	9-22g Low/MC		103
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 DL304 £200	Very Good Excellent	Uncoloured, detailed, neutral, superb tracking; top notch altogether, and a top notch bargain too.	4-12g Low/MC	R	103
Dynavector 17D2 £280	Very Good Very Good	Clear, detailed, neutral and generally very informative - excellent	6-18g Low, MC	R	91
Dynavector DV-50X £99	Good Average	A high-output MC model with impressive lab performance, but whose tip and sound quality both disappointed	6-14g Normal, MC	R	48

TURNTABLES - CARTRIDGES

MODEL PRICE	LAB SOUND	COMMENTS	ARM EFFECTIVE MASS OUTPUT/TYPE	VALUE	ISSUE
Dynavector DV10X IV £125	Average Average +	Fine sounding and realistically priced, damping is recommended to ensure successful tracking ability	8-18g (damping) Normal, MC	R	48
Dynavector DV23RS £230	Average + Good	Sound quality was described as "shut-in", lacking energy and sparkle but with some "edginess" in high frequencies	10-22g Low, MC		28
Dynavector XX-1 £680	Very Good Good +	Good, but not immensely competitive at the price, and not helped by comparison with the low output version	7-15g Normal, MC		84
Dynavector XX-1L £680	Very Good Very Good	Very clear, very detailed, no troubles with tracking; response lift around 20kHz seems to do no harm	7-13g Low, MC	R	84
Empire Benz Micro MC-Gold £130	Good + Good	Nothing is obviously wrong, but nothing is stunningly right either and tracking isn't perfect. Safe, but perhaps a little too safe	7-17g Low/MC		103
Empire Benz Micro MC-Silver £130	Good Good	High output MC that though ultimately not the peer of the MCGold is more appropriate to the sort of equipment it's likely to be partnered with	8-18g Normal/MC	R	103
Empire Benz-Micro MC-2 £699	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 GMC-10EH £50	Good Good	The rising HF trend of this high o/p MC may cause problems in certain systems but with a favourable wind its seductive qualities will win out	8-14g Normal, MC	R	67
Glanz GMC-10LX £80	Average + Average +	Bearing some of the hallmarks of the '10EH, the '10LX is still less competitive in the sonic stakes	7-15g Low, MC		67
Glanz GMC-20E £129	Good + Good +	Very good tracking, smooth sound and good detail. Very slight surface noise enhancement	5-10g Low, MC	R	91
Glanz MFG-110EX £25	Average Average	A little bright but giving detailed bass and clear treble, this was competitive at the price	6-16g Normal, MM	R	43
Glanz MFG-310LX £50	Good + Very Good	Detail and treble outstanding for sub-£100 cartridge. Slight coloration may be due to body resonance	6-10g Normal, MF	BB	85
Glanz MFG-610LX £90	Good + Good +	Similar to cheaper '310 but slightly clearer transients and bass. Benefits from lowish impedance loading	3-10g Normal, MF	R	85
Goldmund Clearaudio £1500	Average + Very Good	Something of a mixed bag overall, its sonic character bears a strong resemblance to the Pradikat though it shares some of the hallmarks of the more expensive Accurate	5-12g Low, MC		60
Goldring 1012 £50	Good + Good	Slightly harsh sound but plenty of life and quite good detail. Some very high frequency coloration apparent	6-12g Normal, MM	R	85
Goldring 1022 £70	Good + Good	As with 1012, a touch harsh; detail and transient purity improved, though, and it goes well with electric guitar!	5-11g Normal, MM	R	85
Goldring 1042 £90	Good + Good	Not terribly subtle, and not such good value alongside 1012 and 1022. Quite lively, though	7-12g Normal, MM		91
Goldring Elan £20	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 Elite £200	Good + Good	The basics are right, and the Elite will cheerfully tackle any source material, but its sound possesses a certain dirtiness which can irritate.	8-18g Low/MC		103
Goldring Epic II £32	Average Average +	An excellent budget choice though the limitations of the stylus are rather obvious at higher frequencies	5-12g Normal, MM	R	67
Goldring Eroica H £105	Good Good -	More confused and coloured than its low-output sibling - high output less of an issue in these days of cheap MC-compatible amplifiers	8-15g Normal, MC		84
Goldring Eroica LX £120	Good + Good	Not the most subtle cartridge in the world; can sound edgy at times, but lively and informative	8-14g Low, MC	R	84
Goldring Excel £549	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
Goldring Excel GS £600	Very Good Good +	The Excel has some true high end quality in its lack of annoying colorations, but tracking seems indifferent and high levels tend to sound rough and edgy.	9-20g Low/MC		103
Grado ZF3E + * £47.50	Average - Average	Downtilting balance disguises the brightness of this cartridge; bit of a mixed bag at this price	9-20g (damping) Normal, MM		54
Grado ZTE +1 £26.50	Average - Average	Bass and treble are a trifle coloured but the midband proved highly enjoyable. Ideal for budget systems	6-13g (damping) Normal, MM	R	54
Kiseki Blackheart £1795	Good Good	This cartridge demonstrated refined poise and a delicate but at once potent security, however, the price did seem a little on the high side compared to other Kisekis	6-16g Low, MC		60
Kiseki Blue Goldspot £450	Very Good Good +	Good bass and imaging, but hints of spit and coloration let the side down slightly	8-15g Low, MC		84
Kiseki Lapis Lazuli £4000	Good Very Good	Combining very sensible design concepts at a silly price, the Lapis Lazuli is best thought of as combining the detail of the MC3000 and the fluidity of the Clearaudios	4-12g Low, MC		60
Kiseki Purpleheart Sapphire £799	Good + Good +	Rare, beautiful to look at and sweet to listen to, our review of this high-flyer conjured up images of Japanese art	5-14g Low, MC		48
Koetsu Black S £612	Average Good +	The S is an OEM design built to Koetsu's blueprint. It features a sturdier fixing plate and offers a brighter, faster and more tactile sound than the earlier K	8-15g Low, MC	R	72
Linn Asaka £373	Good + Good +	Disciples of Linn who are trying to realise their true "Karma" may find that saving money is not a short cut to heaven	9-18g Low, MC	R	Coll. '86
Linn K5 £39	Average Average +	Not as crisply focused as the costlier Linn magnetics, the K5 offers a smoother presentation	7-16g Normal, MM	R	67
Linn K9 £89	Average Good	Linn threw this model into the leading pack by beefing up the Basik's bodywork, adding a super stylus, and keeping the price fair	6-15g Normal, MM	BB	Coll. '86
Linn Karma £564	Very Good Very Good	A specialist which is strongly recommended for Linn-based systems; results may be less predictable in more general application	9-18g Low, MC	R	Coll. '86
Linn Troika £798	Very Good Good +	Good all-rounder, but still some hint of unhappiness at very high levels. Good imaging and bass.	6-18g Low, MC		91
London Maroon £149	Average Average +	Now manufactured under the London brandname this Decca cartridge is as iconoclastic as ever	9-20g (damping) Normal, MM		67
London Super Gold £300	Poor Average -	Immediate and (in the midrange at least) detailed, but very coloured, very nonlinear and questionable effect on records. Devotees swear by it	9-15g (damping) Normal, fixed stylus MM		84
Milltek Aurora £249	Good + Good +	An overall feeling of relaxed ease characterised this clear and atmospheric Kiseki-built cartridge	8-16g Normal, MC	R	Coll. '86
Milltek Olympia £349	Average + Good +	Warm and detailed sound - packs the punch of the best MCs with high output as a bonus	12-20g, (damping) Normal, MC	R	54
Nagaoka MM4 £9	Average - Average -	Clear punchy sound that delivers the rudiments of a good performance	6-16g Normal, MM	R	54
Nagaoka MP10 £18	Average Average	High frequencies sounded "shut-in" with this spherical-stylus model, but mid and mass were energetic, bouncy and punchy	5-13g Normal, MM	R	48

TURNTABLES - CARTRIDGES

MODEL PRICE	LAB SOUND	COMMENTS	ARM EFFECTIVE MASS OUTPUT/TYPE	VALUE	ISSUE
Nagaoka MP11 Boron £40	Average Average +	Responding well overall in PM's equipment and listening room, this model was mildly criticised for low level and dynamic limitations	5-13g Normal, MM	BB	48
Nagaoka MP11 Gold £47	Average - Average +	There were mild criticisms directed at most areas, but in general the sound was clear, open and even	3-8g Normal, MM	R	48
Ortofon 510 £30	Good Good +	For the price, a good blend of virtues - weight, clarity and neutrality.	3-11g Normal, MM	BB	85
Ortofon 520 £50	Average Average +	Very sensitive to load capacitance this new Ortofon maintains the company tradition for a lively, effervescent SQ	7-16g Normal, MM	R	67
Ortofon 530 £80	Good + Good +	Very clean and assured sound; transients not quite perfectly pure but plenty of detail.	4-11g Normal, MM	R	85
Ortofon 540 £100	Average - Average	Graced with an advanced FGII stylus our sample possessed too high a compliance for broad arm matching. It could also sound a little unforgiving	3-8g Normal, MM		67
Ortofon MC10 Super £70	Average Good	"What a delightfully sweet-sounding cartridge this is ..." we said	5-15g Low, MC	BB	48
Ortofon MC15 Super £100	Good + Very Good	A good all-rounder, with outstanding performance in detail retrieval, even if it can be very slightly bright and close-up at times.	10-24g Low/MC	BB	103
Ortofon MC20 Super £200	Average + Good +	An "inviting" sound quality; polite rather than exciting it approaches much more expensive models, but does not better them	6-15g Low, MC	R	Coll. '86
Ortofon MC3 Turbo £100	Average + Good	Not terribly subtle, but it obviously doesn't aim at that. The 3 Turbo is bright, cheerful and bouncy - take it as it comes!	10-24g Normal/MC	R	103
Ortofon MC30 Super £270	Very Good Good +	Beautifully engineered and well-balanced, it was slightly criticised as bland, though some may appreciate the lack of rough edges	5-14g Low, MC		Coll. '87
Ortofon MC3000 MkII £850	Very Good Excellent	Low levels of body resonance are a real ear-opener. Nothing to criticise elsewhere; one of the very best	9-16g Low, MC	R	84
Ortofon MC5000 £1500	Good + Good	Review sample could not be fully run-in, which might explain limited tracking ability and bright and forward sound, though imaging is excellent. Fussy about s.	12-20g Low, MC		91
Ortofon Quartz £120	Good + Good	Lively, quite detailed, and a touch bright, the Quartz has many qualities of the much dearer Quasar	3-12g Low, MC	R	91
Ortofon Quasar £300	Very Good Very Good	Many of the qualities of the MC3000, although a touch bright. Good detail and delicacy	8-15g Low, MC	R	84
Ortofon Quattro £200	Good + Good +	Undoubtedly a competent performer, the Quattro however seems a less obvious choice than the other Qs. Generally neutral, but can be edgy and bright in loud passages.	6-18g Low/MC		103
RATA RP20 £22	Average - Average	Good integration, a clear dynamic midrange and the beginnings of fine stereo imagery merits clear recommendation	6-14g Normal, MM	R	48
RATA RP40 £44	Average Average +	The '40 did a good job of sorting out the layers and complexity of the mix, with good focus, excellent stereo spread and fine scale	6-15g Normal, MM	R	48
RATA RP70 £77*	Average Average +	Clearer and sweeter than the '40 this also seemed heavier and less lively. For £99 you can have a van den Hul stylus	6-14g Normal, MM		43
Rega Bias £34	Average Average +	Difficult to mount in some arms due to its shallow build, the bias offers a gentile, refined SQ that certainly makes it worthy of audition	4-10g Normal, MM		67
Rega Elys £74	Good Good	Clearly superior to the Bias, despite their common heritage, the Elys is both more detailed, accurate and musically convincing	8-15g Normal, MM	R	67
Revolver £20	Average + Average	This modified AT-95E enjoys a very lively mid and treble even if the bass is somewhat 'slower' in comparison. A firm budget buy	8-16g Normal, MM	BB	67
Roksan Corus Black £110	Good + Good	Recognisably related to Corus Blue, but distinctly more civilised and smoother.	7-12g Normal, MM	R	91
Roksan Corus Blue £65	Good + Good	Roksan-specified modified Goldring 1012; slight harshness detracts from otherwise good sound.	7-11g Normal, MM		91
Shure M104E £36	Average - Average	Capable in many ways, but giving no substantial improvement over the 92E in our view	5-15g Normal, MM		38
Shure M105E £49	Average Average -	A slightly 'spitty' sound lacking deep bass and dynamic contrast, but can be used in virtually every system where it will perform "unobtrusively"	5-12g Normal, MM		38 Summ
Shure M110HE £60	Average Average	Sound quality was thought eminently presentable, but not exciting; smooth clear high frequencies, but a loss of bass definition	5-10g Normal, MM		38 Summ
Shure M111HE £72	Average Average	Early reviews of this cartridge complained principally of the price - which has since come down	5-10g Normal, MM		38 Summ
Shure M92E £17	Average - Average	Though lacking depth, the overall sound quality was competent, but treble was not its forte	10-15g Normal, MM		43
Shure M99E £29	Average - Average -	Sister to the 92E this is a solid but not particularly exciting cartridge	5-10g Normal, MM		38 Summ
Shure ME75ED £26.50	Average Average -	Rather bright and splashy in the high frequencies but nevertheless a competent model	5-10g Normal, MM		38
Shure ME97HE £49	Average Average +	It won't turn a sow's ear of a turntable into a silk purse, but will at least keep going and produce an acceptable result	8-20g Normal, MM	R	48
Shure ML120HE £95	Average + Average +	Quite decent sound quality and a generally fine balanced performance	6-18g Normal, MM		48
Shure ML140HE £120	Average + Good	Qualitatively the treble of this well-balanced moving magnet model was a match for many moving coil cartridges	6-16g Normal, MM		43
Shure Ultra 500 £499	Good Good	There was no doubting the accomplishments of what could well be the finest moving magnet cartridge around	6-14g Normal, MM		48
Shure V15 VMR £215	Good Average +	Initial listening gave promising results, but extended familiarity gave the feeling of a lack of energy and a "shut-in" sound	5-12g Normal, MM		38
Shure VST V £173	Very Good Very Good	Quite exceptional assurance with difficult material; very stable and clear sound. One of the best. Dynamic Stabilizer actually works!	4-11g Normal, MM	R	85
van den Hul MC One £699	Good Very Good	This extended all the positive qualities of the '10 but added greater authority and scale - worth it for the extra money	6-12g Low, MC	R	60
van den Hul MC Two £899	Good Very Good	Connected directly to any standard MM input the vdH MC Two rewards with a highly detailed yet fluid and musically convincing portrayal	6-13g Normal, MC	R	72
van den Hul MC1 Super £799	Very Good Very Good	Slight softening effect on transients was the only real flaw, but it didn't quite seem to have that special touch one expects for the money	8-15g Low, MC		84
van den Hul MC10 £599	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 MM1 £200	Good + Very Good	If its wooden-sounding midrange coloration could be tamed, the excellent imaging and admirable all-round security of the MM1 would make it an excellent performer.	7-15g Low/MC	R	103

TURNTABLES

The schizophrenic split between consumer electronics and 'real hi-fi' is most obvious amongst turntables. The former are supplied simply as a means of playing vinyl in a system context. Cheaply manufactured in the Far East, these are complete players with a variety of automatic facilities, sometimes tied into system remote control. But engineering compromises severely limit sound quality, cartridge choice may be P-mount restricted, and such machines are rarely stocked by specialist hi-fi dealers these days.

Specialist turntables offer big sound quality improvements, but lack so-called convenience features (that practised users often find irksome). Such turntables at the cheaper end of the market (sub-£350) tend to be supplied with matching tonearm, and often include a 'starter' cartridge. Still better quality is found at higher prices amongst the separate motor units and tonearms. Careful partnering and set-up is essential for these individual components, but 'naturally sympathetic' combinations do exist, and the good dealer can help.

Listed separately as integrated players and as turntable motor units and tonearms, our sound quality rating is based on results achieved using a high quality system – but in point of fact the turntable is usually the limiting factor soundwise in any system. Lab performance summarises the speed stability, vibration generation and environmental isolation of turntables, along with the friction, alignment and adjustment of tonearms. The tonearm's physical characteristics also define a range of compatible cartridges.

TURNTABLES - INTEGRATED

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	ISSUE
Acoustic Research EB-101 £230	Good Good	This genuine high fidelity product offers an impressive package at a competitive price	Subchassis, manual, 13.5g	BB	48
Alphason Sonata/HR-100S MCS/Atlas £835/£550/£400	Very Good Very Good	Good sound in all areas - bass, clarity and neutrality all in the top class and bettered by very few decks. Atlas PSU expensive but worthwhile	Belt drive, suspended, optional PSU, 13g	R	79
Ariston Pro £160	Good Good	Remarkably clear and detailed for the price, very neutral. Benefits from cartridge upgrade	Manual, belt drive. 12g, cart.	BB	91
Ariston Pro Maxim/RB250 £210	Average Fair	Warm, full sound with a deep bass and solidity is partly offset by lack of fine detail in mid and top. On a suitable surface, with a crisp sounding cartridge, it easily qualifies for shortlisting	Solid plinth, belt drive, manual, 11.5g		103
Ariston Q-Deck £180	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, inc. cart	BB	67
Dual CS-505-4 £170	Average Average	Easy to set up and to use, this is a consistent sounding and well isolated turntable with a long pedigree. It is slightly lacking in balls, but compensates with a consistently unmuddled presentation and good stereo focus perspectives.	Auto-armlift, interlocked cueing, 2 speed, pitch control	R	103
Dual CS-750 £300	Average- Average-	Attractive but lazy performance from a deck with many good ideas and which is a pleasure to use. Cartridge is past it's sell by date. Has 78rpm facility	Solid plinth, belt drive, cart. 3-speed, quartz referenced, auto lift		103
Dual CS430 £100	Average Average -	Ragged, sometimes unpleasant cartridge mixes with a modest pleasing player in a very sharply priced package	Belt drive, with cartridge, auto return, 5g	R	67
Dual CS5000 £230	Average Average +	The rare 78 facility may give grandma's collection a new lease of life but the player did not merit recommendation on price vs sound	Electronic, belt drive, subchassis, 10g		48
Dual CS-503-2 £145	Good - Average	Not wholly inspiring; generally coarse and woolly sound is at least not offensive, but easily bettered by the CS505-4. Good value in material terms	Semi auto, belt drive, 10g	R	91
Goldmund ST4 £4589	Very Good Excellent	The Studio turntable takes on a cheaper tonearm than the T3F, yet provides a similar reference standard performance at £2,000 less, in a neatly integrated though bulky package	Solid subchassis, direct drive, parallel arm, detachable h/shell	R	60
Goldring Excelda 1 £160	Poor Poor	Untidy, resonant sound, narrow effective dynamic range and lack of tracking security. The cartridge (the only authentic Goldring part) is quite nice	Manual integrated arm, synchronous motor, auto-start/stop		103
Heybrook TT2 turntable & arm £469/£269	Average Good +	A gradual process of informed evolution and a sensibly designed arm combine to make this a good sounding middle of the road package. Well supported by dealers	Manual subchassis motor with arm, R belt drive, 14g	R	67
JVC AL-FQ555 £170	Average - Poor	Clear midband sound but woolly bass and crude treble. Ease of use however ranks highly, and there's little to go out of adjustment	Auto, direct drive, 5.5g		67
Kuzma Stabi/Stogi Reference £995/£899	Very Good Very Good	Beautifully made in a solid oak plinth, the Stabi also sounds very clear, detailed and extended. Stogi Reference is also most capable.	Manual, belt drive, subchassis. 12g	R	91
Linn Axis/Akito £443	Good - Average +	A neat, attractive and well-made package which delivers a rather harsh sound with a 'one-note' effect in the bass, but it's well suited to mid market systems	Belt drive, semi-suspended, electronic PSU, 10g		79
Linn Basik £250	Good Average+	Strong midband analysis and imagery, clean if sharp treble is matched to a good if occasionally wooden bass. Good at the price, and requires no complex setting up or fine tuning in service	Solid plinth, inc cartridge, manual speed change	R	103
Linn LP12 Basik/Akito £599/£137	Very Good Good	Familiar Linn virtues and vices - plenty of the former though and few of the latter. Trails the full LP12 significantly, but pace, rhythm, timing etc. still in top class, and bass tauter than of old	Suspended subchassis, belt drive, R single speed, 45rpm adaptor	R	103
Linn LP12-Lingo/Ekos/Troika £1168/£1097/£798	Good + Good +	The classic reference is improved (at a price) by the Lingo but character remains the same - not as detailed or neutral as the best. Ekos arm, though pricey, is well made and suited to many decks	Manual, subchassis, belt drive, 9g	R	91
Manticore Mantra/Musician £340/£170	Good + Good +	Well engineered deck with satisfying sound. The arm is particularly fine and very good value	Belt drive, suspended, 15g	R	79
Marantz TT400 £160	Average - Poor	Everything one hopes a budget deck won't be; coarse, confused, muddled and woolly. Construction isn't wonderful, either	Manual, belt drive 16g		91
NAD 5120 £90	Average Average	A number of running improvements have given this player a range and tautness denied its lazier sounding antecedents.	Semi-auto belt drive, detachable arm tube/weight, 9g	BB	67
Opus 3 Continuo/Decca London International (Revise) £599/£99	Poor Good	Heavyweight motor unit with many fine properties, but which needs further development. The idiosyncratic arm is a suitable (though not ideal) platform for the Decca cartridge. For all its faults though, the whole transcends the sum of the parts	Belt-drive manual, damped unipivot arm, 12g		67
Rational Audio Aura 01 £189	Poor Good	Poor lab results reflect bad rumble, but midrange and treble are very pure and clean; idiosyncratic sound and styling should be tried!	Manual, belt drive, linear tracking arm 10g	R	91
Rega Planar 2 £185	Average + Good	A remarkable product at the price, surprisingly articulate and confident	Manual, 11.5g	BB	48
Rega Planar 3 £250	Good Good	A long time leader in its price category, the '3' (with its excellent RB300 arm) sounded nicely 'musical' in a balanced and coherent manner	Manual, 11.5g	BB	48
Revolver Rebel £185	Average Good -	Quite lively and detailed but not the strongest on subtlety, with slightly lumpy bass. Motor breakthrough audible, and watch for bent motor shaft on delivery!	Manual, belt drive, semi-suspended 12g	R	91
Revox B291* £892	Average - Average -	Sound quality ranks as below average. Subjective bandwidth is narrow and the music lacks grace and energy. Ease of use however is unrivalled	Automatic, remote controllable, direct drive parallel arm, cart		55
Roksan Radius/Tabriz zi £635	Good Good	Truly modern turntable in appearance. The design is subtle, refined and easy on the eye. Musically it offers exceptional performance with a minimum of setting up and operational fuss	Semi-suspended, belt drive, mains plug PSU.	R	103
Roksan Xerxes 33/Tabriz zi £550/£255	Good Good	Good but not exceptional sound quality from expensive package. At its optimum with a relatively inexpensive arm/cartridge unless upgrade to full Xerxes is contemplated. XPSII PSU adds 45rpm and much to sound quality	Semi-suspended, belt drive, 33rpm only, mains plug PSU, one piece arm tube, 'intelligent' counterweight		103
Roksan Xerxes/Artemiz /Artaxerxes £785/£655/£559	Excellent Excellent	Superb though costly record playing hardware, highly integrated and synergistic in nature, but suitable for use with any good MC cartridge. Will not suit all tastes, however	Semi-suspended, belt drive, quartz locked 2 speed PSU	R	103

TURNTABLES - INTEGRATED

■ MODEL ■ PRICE	■ LAB ■ SOUND	■ COMMENTS	■ FEATURES ARM EFF. MASS	■ VALUE	■ ISSUE
Rotel RP-855 £200	Good Good	Great sound for the money - detailed and clear with good bass and no irritating nasties	Belt drive, solid, speed adjust, 9g	BB	79
Systemdek 1/900 £188	Poor Average-	The motor unit is derivative of the Rega Planar 2, but sounds inferior by virtue of insufficient structural integrity. Pitch stability is also far from acceptable	Solid plinth, manual speed change, no cartridge		103
Technics SL-DD33 £120	Average Average	As with the QD33 though better value	Automatic, direct drive, solid plinth, 7.5g, P-mount	BB	48
Technics SL-L20 £120	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 £150	Average Average	The quartz speed controlled version of the DD is short on sound quality but not features. But it did have fair focus and some depth	Automatic, Quartz, direct drive, solid plinth, 7.5g, P-mount	R	48
Technics SLBD-22 £100	Average - Average -	Not bad for the price and a great improvement on the L20, it performs reasonably when not stretched	Semi automatic, solid plinth, electronic, 6g P-mount	R	48
Thorens TD 166 Mk V £240	Good Good	Classic suspended-subchassis deck with clear, stable sound of no particular character. Unlikely to make enemies	Belt drive, suspended, 12g	BB	79
Thorens TD 280 Mk II £190	Good - Good	Legendary Thorens build quality on the cheap - slightly unsuitable sound but eminently liveable-with and very good value	Belt drive, solid, electronic PSU, 12g	BB	79
Thorens TD 316 Mk II £250	Good Good -	Very solid deck with neat split-chassis construction. Sound is a bit insecure in the bass, but it could suit classical music lovers well	Belt drive, suspended, electronic PSU, 12g	R	79
Thorens TD-3001/TP90SF £850	Very Good Good	Excellent middle ranking esoterica, with strong all round abilities rather than excellence in particular areas. Engineering content is particularly high	Suspended subchassis, belt drive, available w/o arm	R	103
Thorens TD166 VI/UK/RB250 £270	Good Average-	Refined and articulate sound with well focused imagery, suitable for use with good MM and budget MC cartridges. The Rega arm is the best at its price, a good purist deck	Manual, belt drive, suspended, 11.5g	BB	103
Thorens TD2001 £650	Good Good -	Similar to TD320 but much dearer - why? Sound is comfortable but not very detailed	Semi-auto, belt drive, subchassis 15g		91
Thorens TD280 II/UK £189	Average Average	Excellent value for money from a built to last player which is also easy to use. Will benefit from a cartridge upgrade in due course, but has an energetic and detailed sound	Solid plinth 2-speed player, inc cartridge	BB	103
Thorens TD320 Mk II £400	Good Good	Good, consistent sounding deck with much improved (but not ideal) arm. A little expensive for performance offered	Semi-auto two speed belt drive, 14g		67
Townshend Rock Reference/Excalibur £2295/£745	Excellent Excellent	Overall the closest reproduction to master tape we've yet heard, with stunning real bass and excellent neutrality. Front end damping trough improves LF detail significantly	Belt drive, suspended, electronic PSU, front-end damping, 12g	R	79
Voyd Reference/Helios Cyalene £5414/£1350	n/a Excellent	Voyd's flagship is equipped with three of the biggest motors in the business, a Lexan platter and a real brute of a power supply (it dwarfs most power amps!). A strong contender for best turntable in the known universe	Belt drive, 3 motors, subchassis, outboard PSU, 12/14g	R	Coll. '90
Well Tempered WTAT £1690	Average Very Good	Intriguing and challenging design. Musically it is not ideal, but it has a limp quality and a lack of artificiality that sets standards as well as turning the ear, though it's not completely uncoloured. A charmer yet mainstream enough in its virtues to be viable	Manual 2-speed, damped, suspended arm, 7.5g	R	67
Zarathustra S4/Pluto 5A Prestige/PSU £1500/£2500/£500	n/a Excellent	The very well made and finished heavy platter S4 with the superb Pluto arm make a devastating combination ranking up there with the very best	Subchassis, manual, available without PSU	R	72

MOTOR UNITS

■ MODEL ■ PRICE	■ LAB ■ SOUND	■ COMMENTS	■ FEATURES	■ VALUE	■ ISSUE
CEC ST930 £599	Good Very Good	A rarity - a serious hi-fi product that loses nothing to budget rivals in finish or convenience. Good clean sound, very stable and assured	Belt drive, external PSU, 78 speed inc.	R	79
CS Audio Resan kit for Rega £90	Good - Good	After-market kit to convert Rega 2 or 3 to semi-suspended subchassis style. Looks good and sounds tidier than original. Feedback is much reduced	Conversion kit, all work reversible	R	79
Michell Gyrodec £595	Good Good	Sweet and natural sounding player, well exploited by the Rega RB300 arm. Aesthetics, and the acres of acrylic, are unique	Manual, belt drive, suspended motor unit		55
Michell Syncro £265	Good Good	A happy blend of qualities endows the Synchro with a blend of subtlety and force - the mailed fist in the velvet glove. Easy on the ear in the best sense.	Manual, belt drive, suspended motor unit	R	67
NVA Senior £450	Good - Average	Very high sensitivity to low-frequency vibration, especially on NVA stand, gives strange subjective bass response and confused sound. Looks are unusual but pleasing	Belt drive, electronic PSU, two-part plinth		79
Oracle Paris £695	Good - Average	Looks good but sounds coarse, confused and uneven, with bass liable to thump	Belt drive, semi-suspended, electronic		91
Origin Live Oasis A £495	Good - Average	Rather coarse sound with lack of detail resolution - but lively presentation may appeal. Appearance is industrial	Belt drive, external mains filter, 33rpm only, suspended		79
Origin Live Oasis B £199	Average Average +	Aesthetics are not its strong point, but its lively and articulate - if idiosyncratic - sound will please some tastes. Highly resonant construction is very sensitive to feedback	Belt drive, 33Gy1/3Gyrpm only, solid plinth/subchassis		79
Oxford Acoustics Crystal Reference £2495	Very Good Excellent	This big, open and powerful sounding turntable works beautifully with Airtangent arm to give superb 3-D imagery. Recently updated to mk.II form	Manual, belt drive, subchassis, stand	R	60
Pink Triangle Anniversary £1175	Excellent Excellent	Possibly the most detailed, clear, neutral and therefore accurate deck around. Likeness to master tape is almost uncanny	Suspended, belt drive, electronic, motor on subchassis	R	91
Pink Triangle Export £676	Very Good Excellent	Basically a PT TOO with built-in power supply. Retains features of great transparency and neutrality. Review sample had highish motor noise - presumed untypical	Suspended, belt drive, electronic	R	91
Pink Triangle Little Pink Thing £392	Good + Very Good	Leads the field for clarity and neutrality at this price or a good bit more. It also looks very smart! Excellent value. Arm cut-out suits Rega or Linn style	Belt drive, semi-suspended, electronic PSU	R	79
Revolver £150	Average Average	Nicely balanced, but unimpressive timing and lightweight bass made this deck rather average for the price. Manufacturer has since made several changes, but not re-submitted for review	Manual, belt drive, solid plinth		48
Systemdek IIX/900 £200	Good Good	The Systemdek IIX is a high performance, low cost turntable which is particularly strong in the areas of fine detail resolution and imagery. Tested with Rega RB250	Suspended subchassis, metal armboard, glass platter, 2 speed	BB	103
Systemdek IIXE/900AP £358	Good Good+	A development of the IIXE/900, with a comparably detailed sound reinforced by better frequency extremes, timing etc. Needs careful setting up.	Suspended subchassis, metal armboard, acrylic platter, PSU	R	103
Systemdek IV £495	Good Very Good	The level of wow is a theoretical concern at least, but elsewhere this player shines, combining euphony, information and imaging in a polished, untemperamental package	Two-speed manual belt drive	R	67
Voyd 0.5 £3062	n/a Excellent	Based on the standard 3-motor Voyd but with upgrade options (better bearing, platter, etc) which take it half way to a Voyd Reference. Superb build and finish; colourful, dramatic performance.	Belt drive, 3 motors, subchassis, outboard PSU	R	72
Voyd Valdi £868	Good - Very Good	Recent power supply upgrade has resulted in around improvements. This Perspex plattered, two motor deck is remarkably competent, revealing and neutral	Belt drive, suspended subchassis, electronic PSU		79
VPI HW-19Mk3 £1600	Very Good Very Good	Built to accommodate parallel tracking arms, this large but elegant deck produced clean, smooth sound when fitted with an SME arm. Good bass	Belt drive, suspended subchassis	R	79

The Directory

TONEARMS

MODEL PRICE	LAB SOUND	COMMENTS	ARM EFF, MAS	VALUE	ISSUE
Airtangent 1B £1990	n/a Excellent	A complex but superbly built arm for high quality systems, giving excellent stereo and resolution	7.5g (vertical)	R	60
Alphason Delta £230	Good Average +	A highly competent design from Alphason gives good sound quality but with slight blurring and treble fizz	16g	R	48
Alphason HR100S £490	Very Good Very Good	This S-shaped arm sounds smooth, but nevertheless reproduces transients with fine attack	10g	R	Coll. '86
Alphason Xenon £286	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
Audio-Technica AT-1130 £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 London International £49	Average + Average +	This uni-pivot design gives a rather rich tonal balance and some bass muddling. Could be good with Decca cartridges, but not well built	12g		48 Summ
Eminent Technology £1000	Good + Very Good	One of the best sounding tonearms around, the linear tracking Eminent delivers impressive stereo imagery, focus and transparent sound	9g (vertical)	R	Coll. '86
Goldmund T3F arm £4400	Excellent Excellent	This complex parallel tracker created an "ear-opening" experience when tested with a (since updated) Goldmund Studio turntable	16.5g	R	Coll. '87
Kuzma Stogi Reference £899	Very Good Very Good	A large, solid and well-made arm that holds the cartridge firmly, giving exceptionally clear sound with just a hint of brightness	12g	R	79
Linn Ekos £1097	Very Good Very Good	Superb, state of the art design which builds significantly on Ittok's strengths	9g	R	67
Moth Arm £95	Good Good +	The ultimate budget arm? Refined, detailed, sweet and natural - performance improves in line with the rest of the system	12g	BB	60
Naim Aro £752	Good Good -	Designed for use on the Linn LP12 turntable and Troika cartridge, the Aro is a little bright and congested.	10.5g		91
Rega RB300 £139	Very Good Very Good	Despite its modest price this sets exceptional performance standards and could be used on a number of high-quality turntables	10-11g	BB	60
Roksan Artemiz £655	Average Good	Interesting design which works a treat on the Xerxes deck. Fits Rega cut-out.	8g		67
Roksan Tabriz £165	Good Good +	Though obviously targeted at Roksan's own Xerxes, it is also a good alternative to the Rega arms in many applications. A trifle bright.	9g	R	91
SME 3009 Series III £253	Good Average +	Comprehensively adjustable and very well made, suited to MM and high compliance MC cartridges	5g		48
SME 3009 Series IIIS £182	Good Average +	A simplified less flexible (as regards adjustment) Series III with a similarly 'soft' sonic character	5g		48
SME 3009R £335	Average + Average +	A higher mass version of the Series III designed for low compliance MC cartridges	12g		48
SME 309 £568	Very Good Very Good	Beautifully made, finished and presented, this arm is fully and easily adjustable and a highly neutral performer	10g	R	79
SME Series IV £828	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 £1232	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

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.

VIDEO RECORDERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	ISSUE
Akai VS-75EK £550	Average Good	Excellent performance and a slick set of controls make this recorder a pleasure to use. Good price is a bonus	Hi-fi, NICAM, programmable remote	BB	71
Akai VS-967EK £500	Average Good	Many well implemented facilities, but unsuitable for dedicated audio use due to lack of LP mode, manual record levels or audio input	Hi-fi, NICAM, on-screen programming	R	86 Supp.
Grundig VS680 £1250	Very Good Average	State of the art technology gives top notch sound with tremendous flexibility but somewhat disappointing picture quality. It's also very hard to drive	Hi-fi, NICAM, LP/SP, teletext programming, on-screen graphics		86 Supp.
Nordmende V4405K £549	Good Good	Fine basic sound and picture quality, but the RF converter introduced significant losses. An excellent model, but configured for German home market. The recorder lacks NICAM	Hi-fi, transmitter handset, digital FX	BB	71
Panasonic NV-F65 £500	Good Average	Uninspired but competent and well made deck. Plenty of features, decent sound and reasonable video ensure recommendation	Hi-fi, NICAM, LP audio only, bar code programming	R	86 Supp.
Sanyo VHR-D4890E £1000	Poor Excellent	High grade S-VHS recorder with digital effects which gives first rate screen-based results but relatively poor sound recording	Hi-fi, NICAM, S-VHS, PIP etc		86 Supp.
Sharp VC-S1000H £1000	Good Poor	Clean, accurate and stable off air and from tape, and LP modes are satisfactory - but on-screen S-VHS results are well below par	Hi-fi, NICAM, LP, S-VHS, titling		86 Supp.

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Personal Messages

Would I like to go over to Massachusetts to visit Boston Acoustics? More than two days of tedious travel for just three in America, to visit a company I knew little about, with sporadic recent UK distribution. No way!

Yes way! Excellent travelling companions and Boston seafood were the first inducements. Chuck in the facts that the two BA speakers I reviewed a year or two back both showed impressively creative engineering, and that one Phil Jones emigrated from Britain to the US and joined BA eighteen months back and my mind was made up.

Paul Messenger goes to Boston to attend more than a clambake.

Co-founder and original engineer of the successful and influential Acoustic Energy range, Phil was one of the most interesting speaker designers to emerge during the Eighties. He and AE split acrimoniously a couple of years ago, so the temptation to find out what he'd been up to was the final persuader.

Boston Acoustics has hitherto been oriented towards the US home market, and has grown steadily through thirteen years to become a major American domestic and in-car hi-fi loudspeaker brand. The reasons why were apparent during the obligatory factory tour. Head engineering honcho and co-founder Andy Petit has a fine grasp of the art of compromise, and a notably sane and down to earth approach to the engineering and assembly detail.

Boston's US success is built on its solid reputation for mainstream box manufacture, but these relatively unglamorous products don't do much to attract attention in fiercer export markets. As British brands like Tannoy, KEF and B&W have shown, unique and special high-end speakers do much to build an international reputation and sales. Which is where Phil Jones comes into the frame. His first major task at BA

has been to head up the Lynnfield Project, a portentous title for two new, related and very innovative hi-tech speaker systems that are quite unlike anything Boston — or any one else for that matter — has produced before.

We only saw and heard prototypes, and it's likely to be the end of the year before production samples reach Europe. But the designs are so radical and interesting, and the sounds they made were so positive, that I can't resist giving a sneak preview.

The LP620 and LP4200 are expected to sell at around £1,500 and £4,000 respectively, the former being a two-way, ported, compact design measuring 41x29x23cm, while the latter uses similar drivers and enclosure (this time fully sealed) sat atop a 3ft tall dedicated subwoofer column.

There are many interesting details throughout the systems, but the most unusual and original is the use of tuned acoustic resonators (AMDs or amplitude modification devices in Bostonspeak) to modify driver output and compensate for resonances.

As his AE background shows, Phil is well into metal diaphragms, but is also realistic about their strengths and weaknesses. Excellent consistency and linearity on the plus side must be set against high relative mass (and hence lowish sensitivity) and the colorations associated with high-Q breakup modes, even though these usually occur outside the nominal working band.

Relying upon metal's high consistency, the little cast AMD tube-traps placed across the diaphragms provide a means of absorbing the high-Q resonances which is much more elegant and kinder to driving amplifiers than placing a nasty high-Q compensating resonant circuit in the crossover network.

The subwoofer uses coupled-cavity operation, driven from two internal (and very unconventional) paper cone drivers. The ports exit at the rear and at floor level, just below a set of much larger pipes which are used to tune out port colorations.

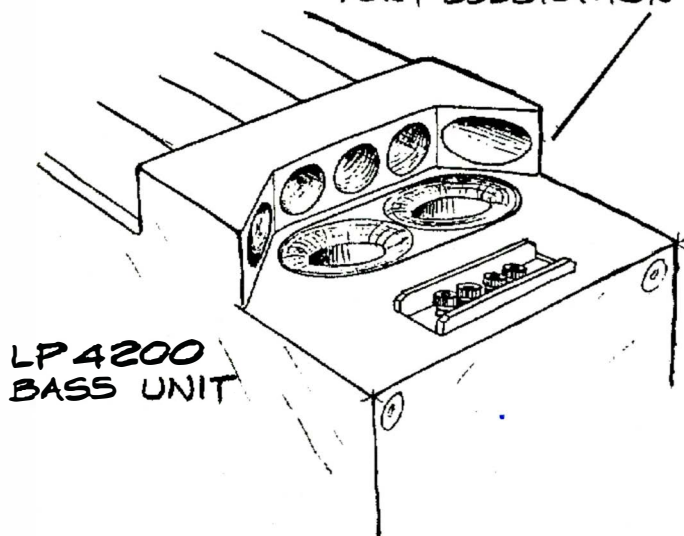
The cabinetwork too is the product of considerable experimentation, and is built up from a complex multi-layer sandwich of MDF, rubber foam and other unmentionables some 45mm thick.

It's dangerous to make snap judgements on new and prototype loudspeakers under unfamiliar surroundings, material and driving equipment, but I heard more than enough to whet my appetite and make me impatient to sample one or the other (preferably both) at home as early as possible.

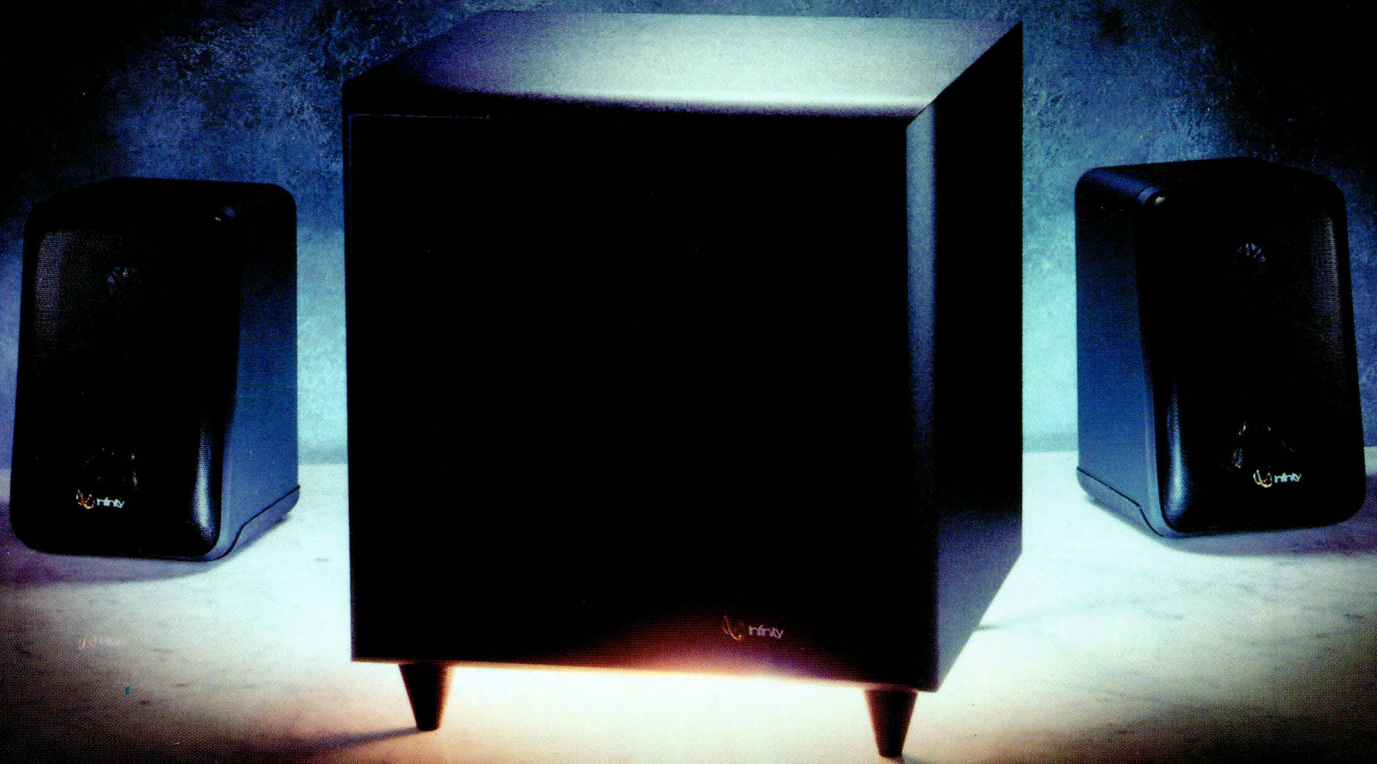
The combination of superb clarity and neutrality alongside a genuine turn of serious speed is as attractive as it is rare, the only cavil being that slightly below average sensitivity places some practical limitations on the ultimate loudness capability.

I suspect that the LP620 will set new performance standards for the luxury compact market that will comfortably justify its fancy price, and the full-range 4200 may well redefine the state of the dynamic speaker art, if not for headbangers. And there's absolutely no doubt that the exciting new technology and striking appearance will put Boston Acoustics much more firmly on the international map over the next year or three.

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