

HI-FI CHOICE

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

MARCH 1990 £2.95

AMPLIFIERS

21 INTEGRATED & PRE/POWER
AMPLIFIERS UNDER REVIEW

AT HOME
WITH MUSICAL MAESTRO
AND QUAD FAN -

EDWARD HEATH

BEST BUYS AWARDED

WE CHOOSE
THE BEST BUYS
AND RECOMMENDED
PRODUCTS

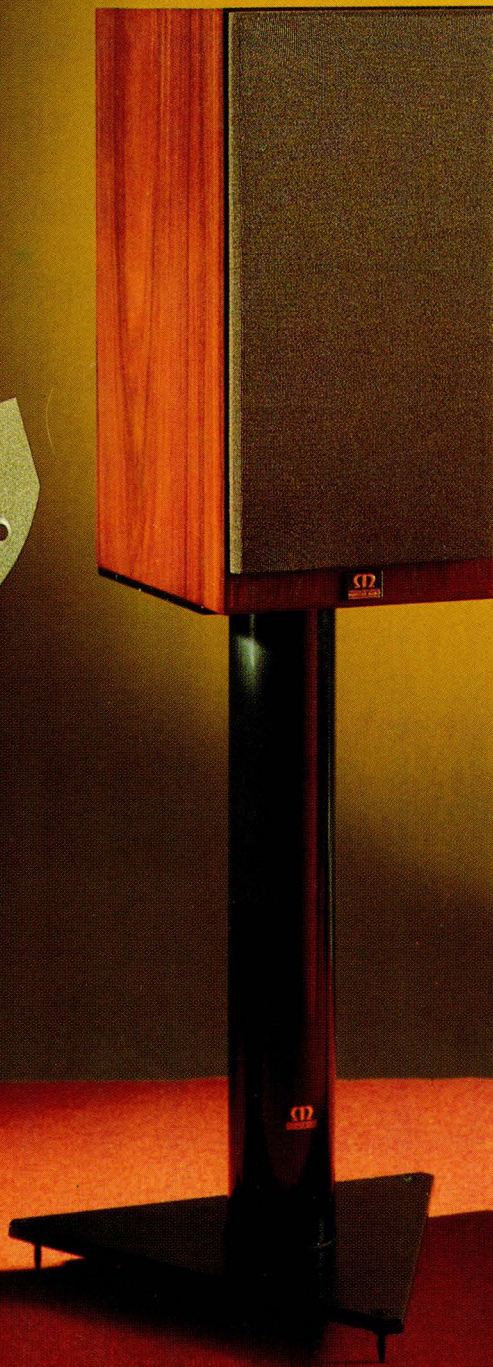
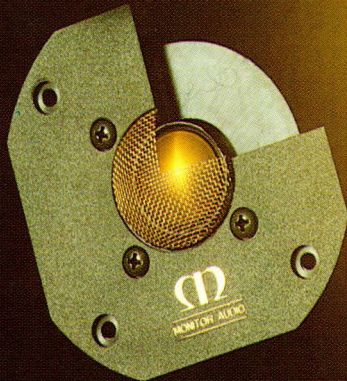
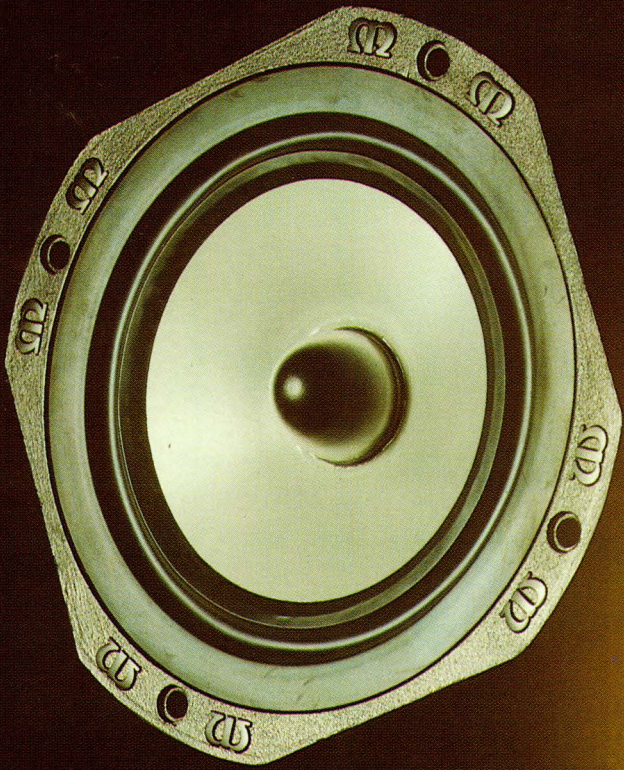
ISSN 0955-1115



OVER
**950 TEST
SUMMARIES**

IN THE CHOICE
BUYER'S GUIDE

STUDIO 10
UNIQUE CERAMIC METAL
TECHNOLOGY
SOMETHING SPECIAL
LISTEN -----



Symbol of Quality

MONITOR AUDIO LTD

Unit 34, Clifton Road, Cambridge, CB1 4ZW.
Tel: (0223) 242898/246344
Fax: (0223) 214 532

THE WORLD'S No.1 GUIDE TO BUYING HI-FI
HI-FI CHOICE
ISSUE NUMBER 80: MARCH 1990

EDITOR:
John Bamford

CONSULTANT EDITOR
Paul Messenger

ASSISTANT EDITOR
Jane Hadley

NEWS/FEATURES EDITOR
Dan Houston

REVIEWS EDITOR
Jason Kennedy

CONTRIBUTORS
Paul Miller, Richard Black, Alvin Gold

ART EDITOR
Andrew Ryan

PHOTOGRAPHY
Chris Richardson and Colin Clarke

ADVERTISEMENT MANAGER
David Reynolds

ADVERTISEMENT EXECUTIVE
Miriam Young

ADVERTISEMENT PRODUCTION MANAGER
Kathryn Balchin

PRODUCTION MANAGER
Judith Middleton

MARKETING SERVICES MANAGER
Zoe Ringrose

SUBSCRIPTION FULFILMENT MANAGER
June Smith

NEWSTRADE CIRCULATION MANAGER
Stephen Ward

PUBLISHING DIRECTOR
Marianne McNicholas

ADVERTISEMENT DIRECTOR
Alistair Ramsay

FINANCE DIRECTOR
Colin Crawford

MANAGING DIRECTOR
Stephen England

CHAIRMAN
Felix Dennis

PUBLISHED by Dennis Publishing Ltd, 14 Rathbone Place, London W1P 1DE.
Tel: 01-631 1433. Fax: 01-436 0350
Company registered in England.
REPRO: Graphic Ideas.

TYPESET by: Time Graphics Ltd. PRINTED by: Riverside Press.
DISTRIBUTED by: SM Distribution,
6 Leigham Court Road, Streatham, London SW16 2PG.
Tel: 01-677 8111.

A



PUBLICATION

Enquiries regarding the content of this journal should be made in writing to *Hi-Fi Choice* Editorial, 14 Rathbone Place, London W1P 1DE. We regret enquiries cannot be dealt with by telephone. 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. This edition © 1990, Felden productions. ISSN No. 0955 111 5.

MENU

We're often asked how we conduct our blind listening tests when assessing amplifiers. There's no mystery to it, nor would we claim our methodology to be an exact science. What we do is much like what you might do at home if you had a few amplifiers to listen to, you had a small group of friends around for the evening, and you fancied having a bit of fun to see which listeners preferred the sound of which amplifier.

Two or three of us act as 'guinea pigs' listening to the music as our reviewer, Paul Miller, swaps and changes amplifiers behind the sofa out of our sight. He usually has half a dozen or so different amplifiers hooked up to the mains and 'warming up' in an adjacent room, and each one is carried through to the listening room and wired into the hi-fi system in turn. Consequently none of the amplifiers are auditioned stone cold – and we haven't got a clue which we've been listening to until Paul reveals all at the end of the day.

In the past we've scribbled our subjective assessments on to paper, leaving the reviewer with a pile of listeners' notes to assimilate when writing the reviews a few days later. Did the listening panel enjoy the performance? Was there a broad consensus of opinion or wild disagreement? Which aspects of the sound were liked or disliked? Paul Messenger, who conducts our loudspeaker tests, still prefers to work this way, but for this amplifiers project Paul Miller decided he would rather we discussed what we'd heard at the end of each presentation. "What did you think of that one," he would ask. And while we chatted amongst ourselves, describing what we'd heard and agreeing – or sometimes disagreeing – about what we liked and didn't like about the amplifier's sound, Paul tapped notes into his word processor. Remember, we still didn't know which amplifier we were discussing!

The basis of all this is that *Hi-Fi Choice* reviews of amplifiers, loudspeakers and CD players aren't the subjective opinion of just one individual, rather they take on board the collective thoughts of a group of listeners who may have different tastes and aspirations regarding what constitutes enjoyable sound. We believe this gives our readers a more useful guide to choosing components.

For next month's *Choice* Alvin Gold has just completed exhaustive tests on a batch of 20 new cassette decks, plus we'll be publishing the results of the listening tests we conducted around Christmas time on five large floorstanding loudspeakers – models from Mission, Apogee, SD Acoustics, B&W and Monitor Audio. The April issue will be on sale March 9th and includes a free cover-mounted stylus cleaner.

John Bamford



Cover photograph of
Rotel and Sumo
amplifiers by
Chris Richardson.

CONTENTS



Top: Ted Heath; politician, sailor and audiophile! Above: Dynavector's diamond cantilevered 17D2 and bottom right, computer style D/A conversion by Wadia.

THE FRONT END

6

UPDATE

The latest news on product and technological developments in the hi-fi industry.

18

CHOICE SESSIONS

Off the beaten track . . . an audiophile recording from America's *Stereophile* magazine; the best kind of cables for digital transmission; Dynavector's forgotten gem – the 17D2 cartridge.

44

READERS WRITE/CHOICE

ANSWERS

Write to us if you need advice or have a comment to make.

ASPIRATIONS

24

A SECOND SKILL

Dan Houston listens to Ted Heath's Quad system.

STATEMENTS

31

The first in a new series concentrating on High-End audio equipment – this month Alvin Gold auditions two very expensive outboard DACs from the United States.

PERSPECTIVES

36

TELLTALE TWEAKS

Jason Kennedy examines the worthiness of a selection of tweaking accessories billed to improve your hi-fi at reasonable cost.

INTERVIEW

100

BILL NELSON

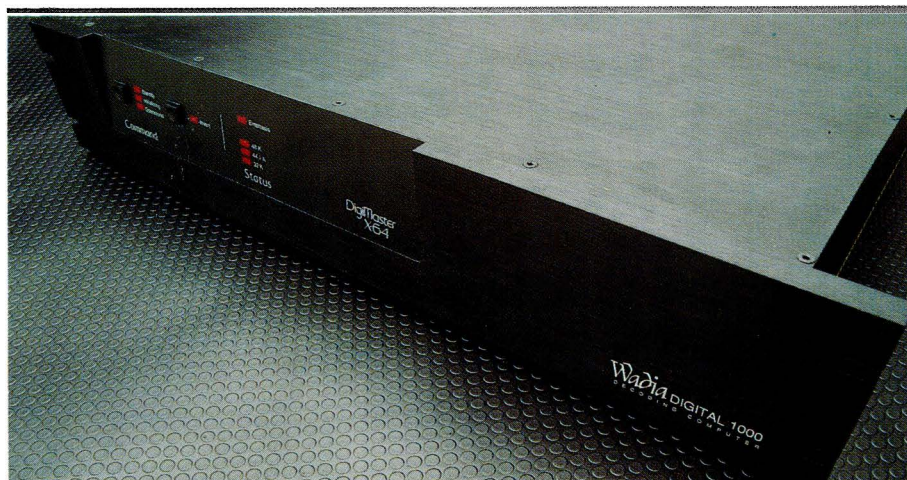
Dan Houston visits the consummate musician who has been churning out music from an attic studio since Bebob Deluxe split in 1978.

AMPLIFIERS

47

CHOOSING AND USING

An introduction to the role of the amplifier in the hi-fi system.





Clockwise from top: The well tweaked Systemdek, audiophile recordings on offer, the Aura VA-40 amplifier reviewed in this month's test group and ex-Bebopper Bill Nelson.



49

AMPLIFIER REVIEWS

Paul Miller conducts our amplifier test – looking at 17 integrated models and four pre/power combinations.

91

TECH TALK

Miller metamorphoses to mega-boffin in a more detailed explanation of the amplifier test procedures.

95

CONCLUSIONS, BEST BUYS AND RECOMMENDATIONS

Rounding off the test with a summary of which contestants made the grade.

THE DIRECTORY

108

CHOICE DEALER DIRECTORY

A regional list of hi-fi stockists including many specialists.

114

THE CHOICE DIRECTORY

Our unique buyer's guide offers comment, price and value ratings on all currently available equipment we have tested.

CHOICE MATTERS

14

BACK ISSUES

Our annual and bi-annual reviewing style makes it easy for new readers to catch up on other topics – use this page for past issues.

17

COMING UP

Next month Alvin Gold fast-forwards, plays and pauses to give his findings on 20 cassette decks . . . plus news, features, and a Free cover-mounted stylus cleaner.

43

AUDIOPHILE RECORDINGS OFFER

Together with Audiofreaks *Choice* is offering UK readers an exclusive selection of superbly recorded classical and jazz music, from Scandinavia and America.

97

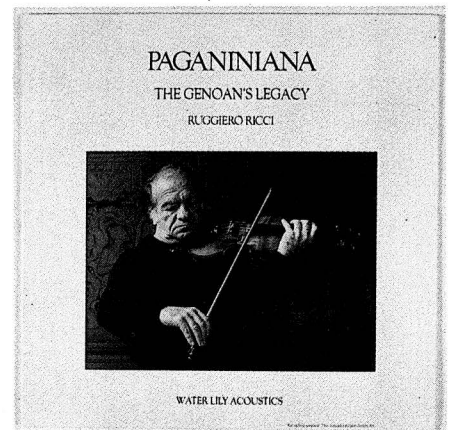
QUANTUM CABLES OFFER

Improve the performance of your hi-fi

107

SUBSCRIPTIONS

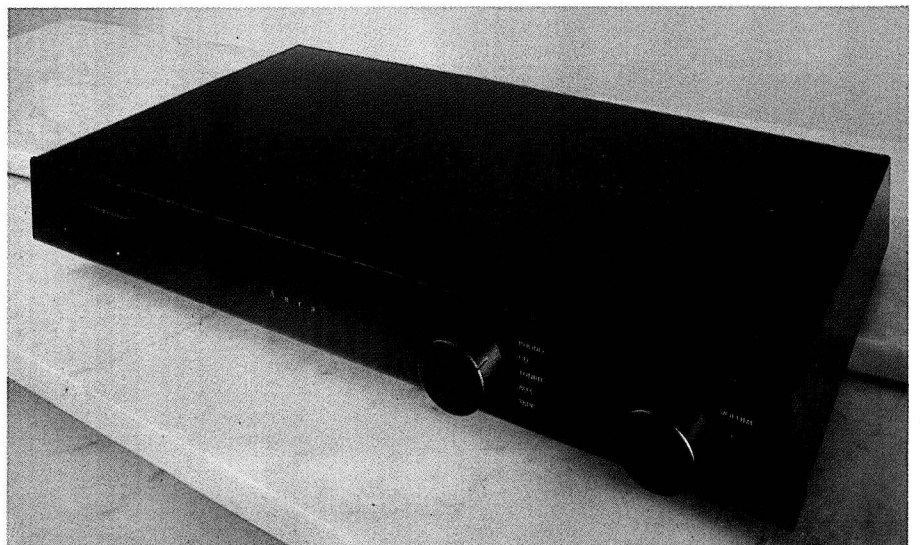
We'll post you the next 12 issues of *Hi-Fi Choice* for just £19.95 – at well over a million words it's a bargain!



152

PERSONAL MESSAGES

The Carpet Piercing Spike!! (Say what!!) Paul Messenger considers the most important technical developments of the 1980s and gives the decade crown to this most simple innovation.





Clockwise from top: The well tweaked Systemdek, audiophile recordings on offer, the Aura VA-40 amplifier reviewed in this month's test group and ex-Bebopper Bill Nelson.



49

AMPLIFIER REVIEWS

Paul Miller conducts our amplifier test – looking at 17 integrated models and four pre/power combinations.

91

TECH TALK

Miller metamorphoses to mega-boffin in a more detailed explanation of the amplifier test procedures.

95

CONCLUSIONS, BEST BUYS AND RECOMMENDATIONS

Rounding off the test with a summary of which contestants made the grade.

THE DIRECTORY

108

CHOICE DEALER DIRECTORY

A regional list of hi-fi stockists including many specialists.

114

THE CHOICE DIRECTORY

Our unique buyer's guide offers comment, price and value ratings on all currently available equipment we have tested.

CHOICE MATTERS

14

BACK ISSUES

Our annual and bi-annual reviewing style makes it easy for new readers to catch up on other topics – use this page for past issues.

17

COMING UP

Next month Alvin Gold fast-forwards, plays and pauses to give his findings on 20 cassette decks . . . plus news, features, and a Free cover-mounted stylus cleaner.

43

AUDIOPHILE RECORDINGS OFFER

Together with Audiofreaks *Choice* is offering UK readers an exclusive selection of superbly recorded classical and jazz music, from Scandinavia and America.

97

QUANTUM CABLES OFFER

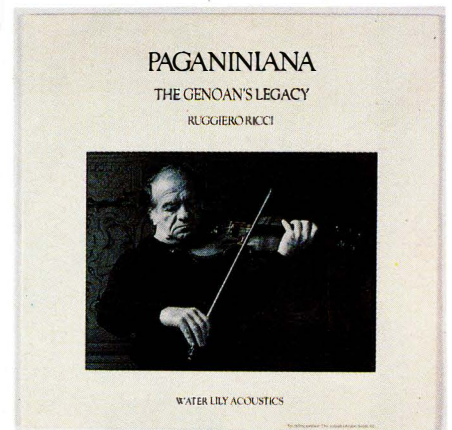
Improve the performance of your hi-fi

with these *Choice*-discounted specialist interconnect cables and accessories.

107

SUBSCRIPTIONS

We'll post you the next 12 issues of *Hi-Fi Choice* for just £19.95 – at well over a million words it's a bargain!



152

PERSONAL MESSAGES

The Carpet Piercing Spike!! (Say what!!) Paul Messenger considers the most important technical developments of the 1980s and gives the decade crown to this most simple innovation.





The Pioneer PD-91 and PD-9300 have been going down rather well. If you haven't heard them yet, have a listen to some people who have. The PD-91 is a stunning performer. This is quite clearly a very musical player and, while I abhor such labels as reference, this is one player that sets the impressive standards

Evidently, the new Pioneer by which others may

rightly be judged. GRAHAM S. MAJOR, WHICH COMPACT DISC, AUGUST 1988.

CD players have been In its sound quality the PD-91 proved as excellent

as rumour had suggested. I felt it was an impressive sounding

greeted with a certain degree of player, one that has

a particular character that is quite the sweetest I have yet to hear

enthusiasm. The PD-91 has attributes so uncommon that

it can be put amongst the best players in its class. To get a CD

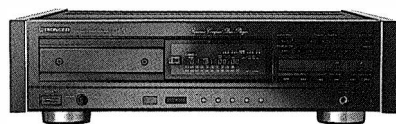
even sounding like this has to be a landmark in itself, the sort

I could listen to for hours. NOEL KEYWOOD, HI-FI REVIEW, OCTOBER 1989.

I like the Pioneer PD-9300 and recommend it enthusiastically

both for performance and value. It looks good, sounds excellent

and offers sensible facilities. If you're looking for a CD player



costing less than £500 you should certainly

audition it. JIMMY HUGHES, HI-FI ANSWERS, SEPTEMBER 1989. However,



there is really only one way to find out if

they sound as good as they say. Have a listen yourself.



UPDATE

PRODUCTS

DELTEC'S 1-BIT ON STREAM

Seen in prototype form at the Penta hi-fi show last autumn, Deltec Precision Audio's 1-bit PDM digital-to-analogue converter is now in full production. Price has been set at £475.

Like Musical Fidelity's *Digilog* and Arcam's *Black Box*, the Deltec *PDM One* is a stand alone external converter for upgrading the performance of any CD player which has a digital output socket. But Deltec's unit is the first converter to employ Philips' 1-bit 256 times oversampling PDM conversion system.

At the heart of the *PDM One* is the Philips *SAA7320* PDM chip, used with Deltec's proprietary *DH-OA32* thick film hybrid audio op-amps. Separate power supplies are provided for the analogue and digital circuits and the unit is housed in the company's familiar style aluminium casework, finished in black slate stove enamel to match its amplifiers.

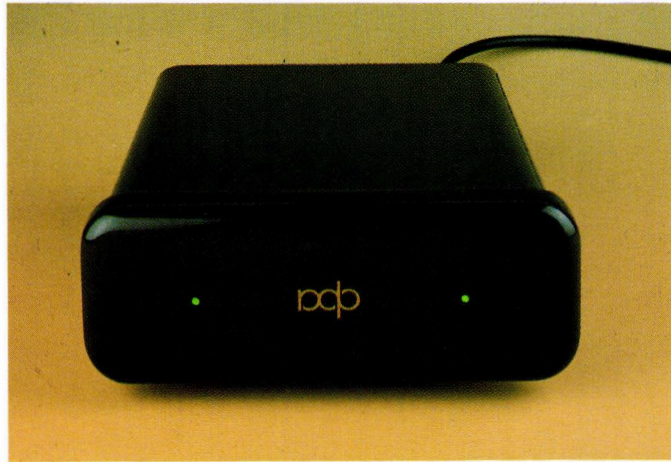
As Deltec recommends you leave the unit permanently powered for optimum sound quality, the on/off switch is hidden around the back. Two LEDs on the fascia indicate power-on and digital data lock; input and output is via phono sockets.

Deltec Precision Audio is based in Cardiff. Tel: (0222) 482818.

PIECES OF EIGHT

Philips' audiophile range – the so-called 8 series – has been joined by the company's first 1-bit 256-times oversampling 'Bitstream' CD player, and a 'high-quality' three-way loudspeaker.

The digital-to-analogue conversion system used in the £349 *CD840* is most accurately described as a PDM system (Pulse Density Modulation) and differs from other so-called 'Bitstream' models which use Technics' PWM (Pulse Width Modulation) circuitry. We first



The future shapes up in the form of Deltec's 1-bit DAC (top); Philips' audiophile loudspeaker completes the 8 series.

mentioned the development in April last year, and this model is one of only a handful of PDM machines on the market. *CD840* joins offerings from Rotel (*RCD 865*), Meridian (*208*) and Deltec (whose *PDM One* outboard converter is also mentioned in these news pages).

Apart from being a PDM player the *CD840* offers other novel features such as a double favourite track selection facility. This enables the user to pre-programme a CD collection in

two different memorised orders – the kind of ultimate his-n-hers kitsch.

The machine continues to cater for every need with two digital outputs – one coaxial, the other optical.

Philips' new loudspeaker is the *FB815* – a 150watt model some 63cm high. It completes the 8-*something* line-up which consists of two CD players (now), a tuner, digital amp and cassette deck. *FB815* uses an eight inch bass driver, four inch midrange cone

and three-quarter inch tweeter to deliver its message. It is finished in dark walnut and comes with its own spiked stands for £350.

TECHNOLOGY

GETTING SPACE TAPED

Juno, the Anglo-Soviet space mission scheduled for April next year, has been sponsored by Memorex tape to the tune of around a million pounds.

Memtek Products Europe, which markets the Memorex brand of cassette and video tape, batteries, cassette decks and personal stereos, was the first official sponsor behind the mission. Memorex tape will be used for all the data collection by Juno and commemorative audio and video 'Juno' tapes are to be marketed here in June. Ashok Suri, Memtek Europe's managing director, told *Choice*: "It's the most prestigious thing we've done for years. The Memorex name will be on the spacecraft and the astronauts' spacesuits. It also gives us the opportunity to get into the Russian market – that's our mission!"

Memorex' involvement began in December when the two British finalists left for training in Star City, USSR. Army helicopter pilot Major Tim Mace, 34, and Helen Sharman, 26, a research assistant – from Mars (Confectionary!) – were given Memorex *Pro 620* personal stereos to help them in their language training.

A SHOW WITH A DIFFERENCE

On Sunday March 25th the Audio Designers Open Day will be held at the Chesterfield Hotel in Malkin Street, Chesterfield. The show will be more of a tweaking extravaganza than the usual product line-up, with companies such as Avondale Audio and Mana Acoustics demonstrating the sort of upgrades that beefed up power supplies and clever tables can offer. Doors open at ten and close at six; admission is free.

PRODUCTS

TRAVELLING COMPACT

The current penchant for portable products sees Denon introducing a mini CD player in February. Costing £250 the *DCP100* is a stylish design and heavier than other, similar, portables at 690g. The machine is apparently capable of playing on the hoof (though these things really aren't jogger-friendly) and will also plug into an amplifier or just a pair of active loudspeakers for minimal hi-fi. Indeed the emphasis is on decent sound quality and it offers dual 16-bit 'Denon Super Linear' digital to analogue converters and an eight-times oversampling filter to give it credentials for that purpose.

Controls are simply laid out and consist of the basic track search and pause facilities – a liquid crystal display tells you where you are. The machine is heavy because it has two battery compartments giving over four hours playing time before recharging from the mains – or the auxiliary batteries can be removed. A lock means that it cannot be accidentally switched on. *DCP100* is finished in grey Velvex – a suede-like texture which is currently perceived as a favourite with the yup and coming classes.

RE-OPENING THE CASE

A year after Finial shelved its *Laser Turntable* we have news the project has been resurrected. Finial was showing the turntable (which reads conventional vinyl records with a laser) in Tokyo last autumn, and we expected the first European

demonstration model as we went to press in January.

The price has now soared to around £20,000 from an original estimate of \$2,500 (more than ten times the original price!) in 1986 shortly after the project was conceived. European importer Dennis Wratten consequently envisages it will only be bought by institutions such as libraries and broadcast companies where wear and tear on vinyl records is a crucial concern. The laser turntable is being made in Japan where the first few hundred have apparently already been ordered.

THIS AND THAT'S

Tape groupies have a new metal formulation cassette from That's to try for size. The *MG-X* tape comes in 60, 90 and 100 minute lengths, costs £2.79 and is available at That's stockists now. It's touted as delivering typical That's reproduction sound – the seemingly contradictory qualities of neutral performance with 'distinctive dynamics' – at a budget price for metal tape.

GOODMANS GOODIES

New loudspeakers and a new CD player arrive from Goodmans this month. The *GCD530* compact disc player is a remote control model offering the usual range of functions including a 20-track memory and three-inch disc compatibility for a penny less than £140. Three new loudspeaker models make up the new *Bookshelf* series. Priced £80, £100 and £130 the *M100*, *M300* and *M500* have evolved from the company's best selling *Maxim* loudspeakers and promise high power handling as well as sensitivity and decent sound quality. All models have rear ports and they handle 75, 85 and 100watts RMS respectively.



Great build and sound quality but don't expect it not to jog if you do.



This is That's tape that's new.



Handmade Finials will now sell for £20,000 – they say.



Capitalising on a well-known maxim Goodmans expands the range.

MARANTZ PRICES UP

Marantz has raised the prices of its CD players and other equipment due to increased cost of production. The increases – between 10 and 15 per cent on previous prices – come because of the higher costs of production

at the firm's manufacturing plant in Belgium in the current economic trough. Marantz says that the weak pound against other European currencies has meant a 12.5 per cent loss for the company over November and December. The *CD50*, *CD50SE*, *CD60*, *CD60SE* and *CD80*

PRODUCTS

TRAVELLING COMPACT

The current penchant for portable products sees Denon introducing a mini CD player in February. Costing £250 the *DCP100* is a stylish design and heavier than other, similar, portables at 690g. The machine is apparently capable of playing on the hoof (though these things really aren't jogger-friendly) and will also plug into an amplifier or just a pair of active loudspeakers for minimal hi-fi. Indeed the emphasis is on decent sound quality and it offers dual 16-bit 'Denon Super Linear' digital to analogue converters and an eight-times oversampling filter to give it credentials for that purpose.

Controls are simply laid out and consist of the basic track search and pause facilities – a liquid crystal display tells you where you are. The machine is heavy because it has two battery compartments giving over four hours playing time before recharging from the mains – or the auxiliary batteries can be removed. A lock means that it cannot be accidentally switched on. *DCP100* is finished in grey Velvex – a suede-like texture which is currently perceived as a favourite with the yup and coming classes.

RE-OPENING THE CASE

A year after Finial shelved its *Laser Turntable* we have news the project has been resurrected. Finial was showing the turntable (which reads conventional vinyl records with a laser) in Tokyo last autumn, and we expected the first European

demonstration model as we went to press in January.

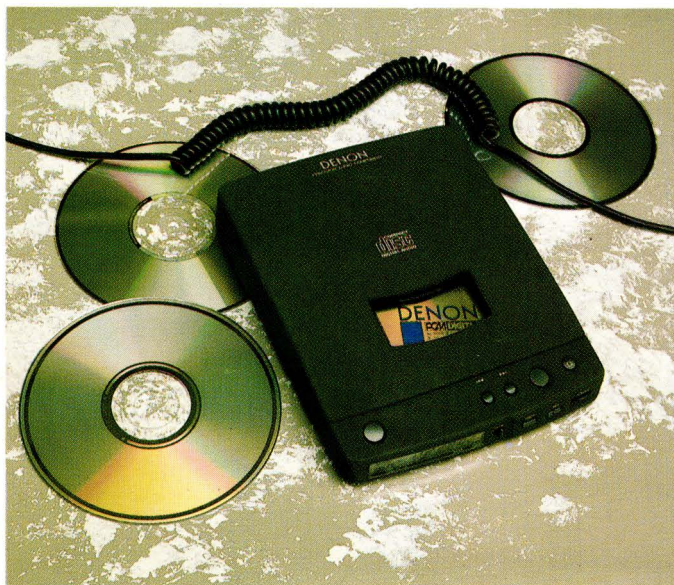
The price has now soared to around £20,000 from an original estimate of \$2,500 (more than ten times the original price!) in 1986 shortly after the project was conceived. European importer Dennis Wratten consequently envisages it will only be bought by institutions such as libraries and broadcast companies where wear and tear on vinyl records is a crucial concern. The laser turntable is being made in Japan where the first few hundred have apparently already been ordered.

THIS AND THAT'S

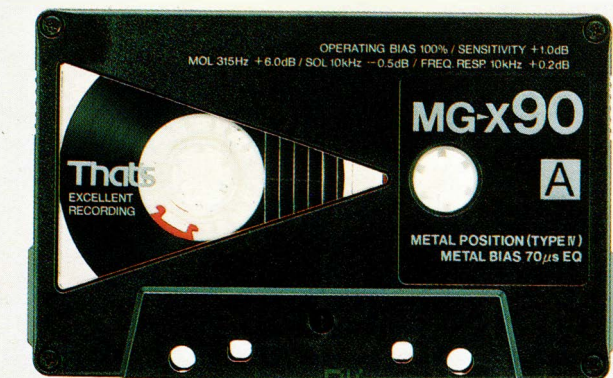
Tape groupies have a new metal formulation cassette from That's to try for size. The *MG-X* tape comes in 60, 90 and 100 minute lengths, costs £2.79 and is available at That's stockists now. It's touted as delivering typical That's reproduction sound – the seemingly contradictory qualities of neutral performance with 'distinctive dynamics' – at a budget price for metal tape.

GOODMANS GOODIES

New loudspeakers and a new CD player arrive from Goodmans this month. The *GCD530* compact disc player is a remote control model offering the usual range of functions including a 20-track memory and three-inch disc compatibility for a penny less than £140. Three new loudspeaker models make up the new *Bookshelf* series. Priced £80, £100 and £130 the *M100*, *M300* and *M500* have evolved from the company's best selling *Maxim* loudspeakers and promise high power handling as well as sensitivity and decent sound quality. All models have rear ports and they handle 75, 85 and 100watts RMS respectively.



Great build and sound quality but don't expect it not to jog if you do.



This is That's tape that's new.



Handmade Finials will now sell for £20,000 – they say.



Capitalising on a well-known maxim Goodmans expands the range.

MARANTZ PRICES UP

Marantz has raised the prices of its CD players and other equipment due to increased cost of production. The increases – between 10 and 15 per cent on previous prices – come because of the higher costs of production

at the firm's manufacturing plant in Belgium in the current economic trough. Marantz says that the weak pound against other European currencies has meant a 12.5 per cent loss for the company over November and December. The *CD50*, *CD50SE*, *CD60*, *CD60SE* and *CD80*

COVENT GARDEN RECORDS

AT

84

**CHARING CROSS ROAD
LONDON WC2H 0JA**

Tel: 01-379 7635/7427

Fax: 01-836 1345

Open Mon - Sat 10.00 am - 7.30 pm 2 mins from Leicester Sq Tube

THE COMPLETE SERVICE TO ALL MUSIC LOVERS

AT LONDON'S FINEST COMPACT DISC CENTRE



NEW RELEASES

Classical full price new releases only £9.95 and mid price £6.95 per CD for the first 30 days after issue: Decca, DG, Philips, EMI, CBS, RCA and selected others.

LISTENING FACILITIES

Not only the cheapest new releases in town but also full individual listening facilities - listen before you buy.

8,000 CDs IN STOCK

A continually updated and growing stock of the best classical compact discs.

SECONDHAND

Secondhand CDs bought and sold, on sale from £5.99.

TOKEN SCHEME

Unique scheme of one token for each CD you buy (value £10.95 and over) entitles you to a free CD when you have collected ten to the value of £10.95.

SPECIALISTS IN CD PLAYERS

Over 45 CD Players in stock and on demonstration. From £149 to £5,000.

QUALITY AUDIO

We stock an excellent range of some of the best audio equipment and loudspeakers available from famous names such as Arcam, Audiolab, B&W, Celestion, Cyrus, Denon, Dual, Marantz, Meridian, Monster Cable, Nakamichi, Phillips, Pioneer, Proac, Quad, Revox, Rogers, Senheiser, Sony, Technics, van den Hul, Yamaha, and more.

DELIVERY AND INSTALLATION

Free delivery in the London area on selected Hi-Fi systems. Installation service available. Orders actioned within 24 hours subject to stock availability.

DEMONSTRATION

Two private demonstration rooms to audition your future purchase. Demonstration room can be prebooked. Please phone to make an appointment.

SERVICING

Full up-to-date department for servicing and CD Player specialist upgrading by qualified technicians.

MISSION ELECTRONICS



▶ FULL RANGE of Mission Speakers 761 to 767 in stock and on demonstration.

▶ Designed for every type of room and every type of pocket.

▶ 5 YEAR WARRANTY on all MISSION Speakers.

▶ Stockists of COMPLETE RANGE of CYRUS audiophile products: Cyrus One, Two, PSX, Tuner, 781, 782, speakers and the renowned PCM2 CD Player.

▶ Featuring complete range of MISSION and CYRUS ACCESSORIES.

▶ These outstanding products set new standards for reproducing music as it was performed.

**£50
OFF
DISCS**

**WHEN YOU BUY A
CD PLAYER (or Audio
Components over £500)**
Bring this coupon in during
FEB/MARCH
and get £1 off your next
50CDs over £6.99 this year

HFC 03 90

Sale & Special offer goods excluded Valid until end of Feb 1990

**£6
OFF**

**ON PURCHASE OF
5 CDs OVER £9.95**

84 Charing Cross Road, London WC2
No Tokens Given
Valid to end of MARCH 1990

HFC 03 90

**£1
OFF**

**ON PURCHASE OF
1 CD OVER £9.95**

84 Charing Cross Road, London WC2
No Tokens Given
Valid to end of MARCH 1990

HFC 03 90

compact disc machines go up approximately ten per cent while the *PM94* amplifier, *LD20DMS* loudspeakers, *CP230* and *CP430* portable cassette recorders will go up between 10 and 15 per cent.

STORE MORE

Capitalising on the dearth of stylish software storage a furniture maker has introduced a range of CD and musicassette shelves and trays. Beaver and Tapley, of Southall, Middlesex, has launched *Trakraks* – a series of high-tech looking organisers which keep that disc or tape collection tidy. The perforated black metal trays are for either 40 CDs or 25 cassettes and cost around £12. Shelves are finished in black ash and include wall fixings. They are £30 for a 22-inch long version or £40 for a 33-inch version which holds 79 CDs.

GETTING IT TOGETHER

The latest invention from Linn Products is an integrated amplifier called the *Intek*. At £498 it is expensive as far as all-in-one amps go but Linn says the performance more than justifies the price. The 50watt (8ohms RMS) *Intek* lists several features to support the boast such as gold plated terminals, internal split power supply and an absent tone control. The volume control features a dual pot' for left and right channels. Six inputs cater for auxiliary, CD, tape, video and tuner while the MM/MC phono stage is similar to that found in Linn's top quality *LK1* preamplifier. A selector allows one to listen to one source while recording another.

SLIMMER MODELS

SD Acoustics has re-designed its loudspeaker range, tightening up some design details in order to make the transducers sound even better. The *SD1* becomes slimmer and shorter, getting a new bass system of two eight-inch drivers in their own ported enclosure, and a six-and-a-half inch midrange driver which is open-baffle mounted. The tweeter from the old model remains, as does the £1,150 price tag. The *SD-3* has an updated bass and midrange driver to give it better coverage of the lower frequencies and a 4cm slimmer profile. It goes up in price from £295 to £349.

The *OBS* also has a new midrange driver – the same type as used in the new *SD1* – which is said to 'integrate with the tweeter perfectly'. Price remains £695.

LOOKING AHEAD

Cambridge Audio says its new 1-bit mid-price CD player is just about off the drawing-board and should be launched at Chicago CES in June. "The 16-bit x16 *CD3* has achieved cult status and people tell us never to change it, but this new system will be a remote control gleaming object and up there with all the others," PR man Andy Giles said. Future Cambridge products also include a loudspeaker system and tuners, though a cassette deck (a UK first) remains a rumour.

OUT CAR ENTERTAINMENT

Yuppies who like to carry their detachable in-car head units into pubs to impress friends can now go one better. Pyle Pounder speaker systems are also designed for that carry-out appeal. New to the UK, the Pyle Pounder system offers several variations of self contained units, from £219 worth of compact mini to the £399 'Triple Pounder' with its array of 12-inch bass and five-inch midrange drivers and one-inch tweeters. All are boxed and designed to sit on the rear shelf of the car – or for the boot – where they can be unplugged and removed easily. The touted advantages are anti-theft, and cheap installation with no mess. But for those of us who want the audio equivalent of plonking our Porsche keys next to our pint the allure is obvious.

ALL SINGING, ALL DANCING

With the advent of NICAM stereo television broadcasts on the independent networks this year Ferguson has a new all singing and dancing flagship model *CTV*.

For £1,299 the 33-inch *78M5* lists enough facilities to keep you absorbed in itself – let alone what it transduces. Sound quality



Dixons: A chance to get upstream of Kingfisher?

looks promising on paper, though you can replay the sound through dedicated audio outputs to your own hi-fi for optimum use. The TV uses four built-in loudspeakers and a separate subwoofer on its own stand.

If the idea of owning such a piece of equipment is worrying, Ferguson promises help: the Interactive Menu Control circuitry guides owners step by step through the setting up and operating process with on-screen graphics and movable cursor. It's made possible by an on-board computer which controls the teletext facility and allows up to 72 page numbers to be remembered for recall. A child lock effectively disables the set which can only be re-tuned with the remote control unit.

As mentioned, there is an audio outlet and loudspeaker extension sockets as well as two Peritel (SCART) sockets, one of which caters for Super VHS inputting.

BUSINESS

LULL IN FISHING SEASON

Kingfisher's bid to buy the electrical retail chain Dixons has been referred to the Monopolies and Mergers Commission in a

move delighting Dixons' management. They have been fighting off the bid and argue that if Kingfisher (which owns Comet and recently bought the Laskys chain of shops) succeeds, it will have more than 25 per cent of market share and therefore be able to monopolise electrical retailing in the High Street.

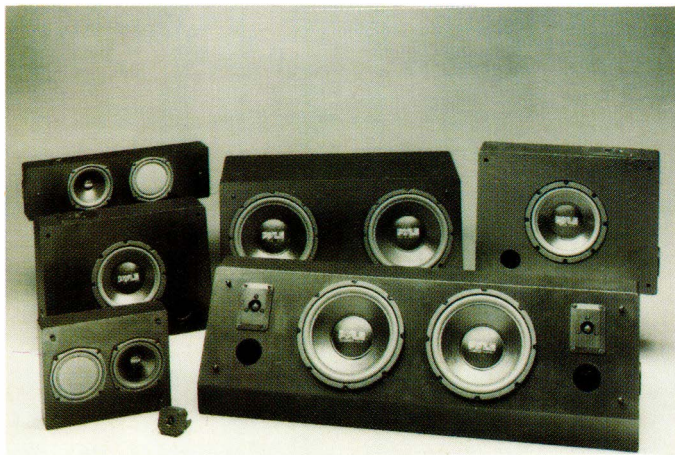
But a Kingfisher spokesman told *Choice*: "The key to the (Commission's) investigation is whether the merger would be in the public interest. And the decision will be based on more detailed studies such as price and product control and retail locations. The essence of the bid is that Dixons is in decline and needs new management to put it right."

Dixon's shareholders have so far proved unwilling to vote for the £568m offer – just 0.13 per cent of them accepted in January. But if the Monopolies Commission decides in Kingfisher's favour on April 27th, they may be exhorted by the management to accept a different buyer. Rumour has it that another, continental buyer, is waiting in the wings.

ONE FROM THE ROAD

Roadstar – the Swiss company known here as an in-car entertainment specialist – has acquired the *Sentra* name with which to brand its own domestic audio and video products in the UK. *Sentra* is a Yorkshire based audio and video products marketing operation concentrated in the North of Britain. Details of the new Swiss-made product range weren't known as we went to press but Jeremy Carne, for Roadstar's *Sentra* Audio Video Division, said that existing dealers had been positive about the change.

Roadstar undertakes to honour guarantees on all existing *Sentra* products and to provide spares and service. Roadstar ICE remains a separate division.



Plug-in speakers from thief-foiling Pyle.

exposure



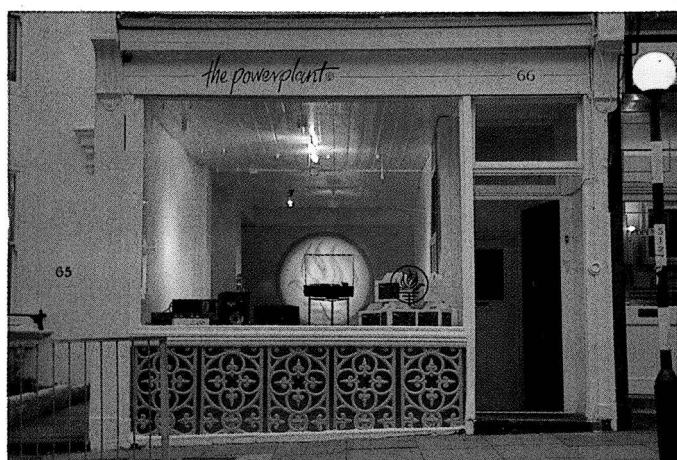
THE WORKS: 59 NORTH STREET, PORTSLADE, SUSSEX BN4 1DH Tel: 0273 423877
Fax: 0273 430619



Can't have any of my sweets: but Tanita's got a pair of B&Ws.

The Power Plant: new specialist for the best in hi-fi.

JVC requires a make-up assistant for its new film company.



IN BRIEF

Streetwires, specialist in-car audio cable manufactured in the USA by Esoteric Audio is now available in the UK from Power Drive Ltd, of Swindon, Wiltshire, which is also distributing the Altec Lansing range in this country.

Zeus Audio, of Belfast, is holding a series of musical evenings in February and March. The Oracle turntable/Rowland amplifiers and Infinity loudspeakers can be heard on February 21st while Alphason features on March 7th. The Voyd, Audio Innovations and Snell set-up are covered on March 21st. All take place at the Drumkeen Hotel and start at 7.30pm. Tickets from Zeus: (0232) 332522.

Music enthusiasts in Brighton have a competent and stylish new hi-fi shop. The Power Plant is at 66 Upper North Street and stocks sonic goodies from Roksan, Bryston, Musical Fidelity, Cambridge and JPW among other brands. It is run by ex-Cornflake Shop staff. Telephone: (0273) 775978.

The Bristol Hi-Fi Show will again take place at the Holiday Inn, Bristol over the weekend February 16th-18th 1990. Admission is £2 - children under 14 - free.

Appollo, maker of loudspeaker stands and isolation furniture, has changed the spelling of its name to Apollo.

KEEPING IT SWEET

Sponsorship seems to be the tune of the month as B&W Loudspeakers announces it is behind Tanita Tikaram's current UK tour - promoting her second album *The Sweet Keeper*. The Worthing firm is also running a national competition giving away a complete hi-fi system (Nakamichi CD player, Aura amp and B&W DM570s) as part of £2,000 worth of hi-fi prizes. Entry forms are at B&W dealers, concert venues and record shops.

JVC HITS THE BIG SCREEN

JVC has joined forces with ex-20th Century Fox president Lawrence Gordon to form Largo entertainment which intends to produce three 'quality' movies a year. The company's first production was *Mystery Train* directed by Jim Jarmusch of *Down by Law* fame.

Mystery Train is three stories that revolve around a seedy hotel in downtown Memphis. Joe Strummer as an English no-hoper who's lost his job and his

gal combines with a John Lurie score to make a casually paced and witty film that's very much in the cult vein.

ALPHASON BRANCHES OUT

Loudspeaker and turntable specialist Alphason Designs is branching out into the field of live recording. Managing Director Mike Knowles told *Choice* that the firm had recorded several live bands and musical events using the Calrec Soundfield ambisonic microphone on to R-DAT. "The aim is to control everything from the musicians to the listener in his living-room," he explained. "We want to create a live acoustic that really *is* live."

After some initial success and reportedly enthusiastic support from recording engineers and audiophiles alike, Alphason plans to refine the system and be in a position to produce its own software - either CDs or vinyl records - by the end of the year. Recordings of live entertainment both classical and popular will make up the catalogue.

SHOW PRIZEWINNERS

Zeus Audio of Belfast, organisers of the Northern Ireland Hi-Fi Show, have sent us the results of the prize draw which was free-to-enter for all show visitors. Here are the prizes which were up for grabs, along with the names of the lucky winners:

Shan speakers - C Bell, Belfast
 VdH cable - M Searles, Newtownabbey
 Cambridge P50 - C Craig, Ballyclare
 Marantz CD player - K L Diong, Belfast
 Proton AM200 - B McKay, Ballymoney
 Wharfedale Diamonds - S McDowell, Carrickfergus
 Mission 761s - P Keenan, Belfast
 Rotel RA810 - M Jones, Finaghy
 ANV cable - McCleery, Rimavady
 Celestion 3s - S Kerr, Holywood
 Aiwa tape deck - G Cowan, Belfast
 Alphason R333 table - J Reynolds, Hillsborough
 Standedesign stands - B Togneri, Bangor
 Goodmans Point 3s - M Magee, Belfast
 Target 776 - N Flynn, Ballymeena
 Sansui personal - W Thompson, Limawady
 Yamaha 'phones - B Higgins, Antrim
 Sony headphones - S Orr, Belfast
 Ariston Platform - R Logan, Newtownards
 Alphason arm lift - S Kerr, Ballynakinch
 Chord cable - J Harrison, Ballycastle
 That's tapes - J Barrie, Ballinakinch
 Hunt cleaner - P Walsh, Bangor
 Decca brush - S McQuillen



Can't have any of my sweets: but Tanita's got a pair of B&Ws.

The Power Plant: new specialist for the best in hi-fi.

JVC requires a make-up assistant for its new film company.



KEEPING IT SWEET

Sponsorship seems to be the tune of the month as B&W Loudspeakers announces it is behind Tanita Tikaram's current UK tour – promoting her second album *The Sweet Keeper*. The Worthing firm is also running a national competition giving away a complete hi-fi system (Nakamichi CD player, Aura amp and B&W DM570s) as part of £2,000 worth of hi-fi prizes. Entry forms are at B&W dealers, concert venues and record shops.

JVC HITS THE BIG SCREEN

JVC has joined forces with ex-20th Century Fox president Lawrence Gordon to form Largo entertainment which intends to produce three 'quality' movies a year. The company's first production was *Mystery Train* directed by Jim Jarmusch of *Down by Law* fame.

Mystery Train is three stories that revolve around a seedy hotel in downtown Memphis. Joe Strummer as an English no-hoper who's lost his job and his

gal combines with a John Lurie score to make a casually paced and witty film that's very much in the cult vein.

ALPHASON BRANCHES OUT

Loudspeaker and turntable specialist Alphason Designs is branching out into the field of live recording. Managing Director Mike Knowles told *Choice* that the firm had recorded several live bands and musical events using the Calrec Soundfield ambisonic microphone on to R-DAT. "The aim is to control everything from the musicians to the listener in his living-room," he explained. "We want to create a live acoustic that really *is* live."

After some initial success and reportedly enthusiastic support from recording engineers and audiophiles alike, Alphason plans to refine the system and be in a position to produce its own software – either CDs or vinyl records – by the end of the year. Recordings of live entertainment both classical and popular will make up the catalogue.

SHOW PRIZEWINNERS

Zeus Audio of Belfast, organisers of the Northern Ireland Hi-Fi Show, have sent us the results of the prize draw which was free-to-enter for all show visitors. Here are the prizes which were up for grabs, along with the names of the lucky winners:

Shan speakers – C Bell, Belfast
 VdH cable – M Searles, Newtownabbey
 Cambridge P50 – C Craig, Ballyclare
 Marantz CD player – K L Diong, Belfast
 Proton AM200 – B McKay, Ballymoney
 Wharfedale Diamonds – S McDowell, Carrickfergus
 Mission 761s – P Keenan, Belfast
 Rotel RA810 – M Jones, Finaghy
 ANV cable – McCleery, Rimavady
 Celestion 3s – S Kerr, Holywood
 Aiwa tape deck – G Cowan, Belfast
 Alphason R333 table – J Reynolds, Hillsborough
 Standedesign stands – B Togneri, Bangor
 Goodmans Point 3s – M Magee, Belfast
 Target 776 – N Flynn, Ballymeena
 Sansui personal – W Thompson, Limawady
 Yamaha 'phones – B Higgins, Antrim
 Sony headphones – S Orr, Belfast
 Ariston Platform – R Logan, Newtownards
 Alphason arm lift – S Kerr, Ballynakinch
 Chord cable – J Harrison, Ballycastle
 That's tapes – J Barrie, Ballinakinch
 Hunt cleaner – P Walsh, Bangor
 Decca brush – S McQuillen

IN BRIEF

Streetwires, specialist in-car audio cable manufactured in the USA by Esoteric Audio is now available in the UK from Power Drive Ltd, of Swindon, Wiltshire, which is also distributing the Altec Lansing range in this country.

Zeus Audio, of Belfast, is holding a series of musical evenings in February and March. The Oracle turntable/Rowland amplifiers and Infinity loudspeakers can be heard on February 21st while Alphason features on March 7th. The Voyd, Audio Innovations and Snell set-up are covered on March 21st. All take place at the Drumkeen Hotel and start at 7.30pm. Tickets from Zeus: (0232) 332522.

Music enthusiasts in Brighton have a competent and stylish new hi-fi shop. The Power Plant is at 66 Upper North Street and stocks sonic goodies from Roksan, Bryston, Musical Fidelity, Cambridge and JPW among other brands. It is run by ex-Cornflake Shop staff. Telephone: (0273) 775978.

The Bristol Hi-Fi Show will again take place at the Holiday Inn, Bristol over the weekend February 16th-18th 1990. Admission is £2 – children under 14 – free.

Appolo, maker of loudspeaker stands and isolation furniture, has changed the spelling of its name to Apollo.

The summer sounds of village cricket. Auntie Beeb's measured tones. Both indisputably British. But Sony?

In actual fact, Sony's ES separates range sounds equally Anglo-Saxon. If only because it's produced with the help of the world's best audio specialists.

Us. That is, a team of distinctly British consultants, attuned to the precise demands of the British ear. (And, seemingly, to the preferences of the British hi-fi media.)

What of the pedigree of the equipment itself?

The range of CD players brings 45 bit eight times over-

sampling digital filtering to Britain for the first time. As the designer would have it, this transcends engineering. What's left is pure musicality.

In each model, interference has been all but eradicated. The CDPX7, for instance, sports ten times over-powered transformers, reducing magnetic leakage, fluctuations and hum to the unmeasurable.

(In fact, the obsession with obliterating spurious noise is carried over to every ES component. Thus all tape heads are laser welded, avoiding magnetization during manufacture.)

LEATHER ON WILLOW. THE BBC. SONY.



SONY.ES

Among the amps, you'll discover another catchily named first: Pulse Density Modulation Digital Analogue Conversion. It's enough for some critics to swear by, but the choice, should you prefer 'conventional' DAC allied to a CD player, is yours.

Whichever, all ES amplifiers have a 'source direct' facility. Bypassing tone controls and filters, the net result is a 'piece of wire with gain' for the purists.

The range of speakers for the ES system is as impressive as it's broad. A listen to the twin drivers of

the APM 141s, for example, is an education in ice-like dynamic control.

And every one of the ES tuners features Sony's unique Direct Comparator circuit, specifically designed to combat FM station 'drift' and ensure crystal-clear reception.

All said, the entire ES range sets punishing standards for hi-fi separates.

After visiting a dealer listed overleaf, perhaps you'll ask the same question Sony engineers ask each day.

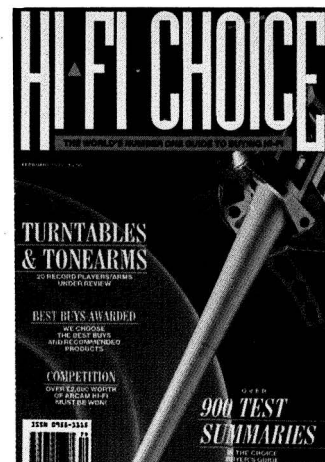
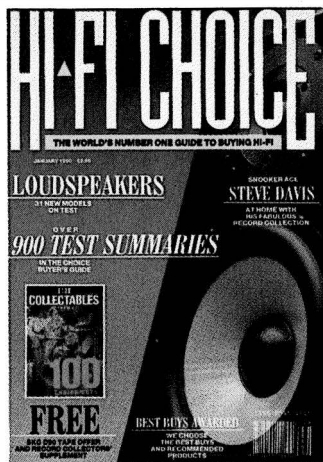
Why compromise?

THEY MAKE YOU PROUD TO BE BRITISH.



BACK ISSUES

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



TO ORDER BACK ISSUES: Please tick those you require

- Feb 88 TURNTABLES & TONEARMS (55)
Also includes: Tuners
Plus: Headphones
- March 88 AMPLIFIERS (56)
Also includes: Cassette tapes
Plus: Personal stereos
- April 88 CASSETTE DECKS (57)
Also includes: Valve amplifiers
Plus: Hi-fi furniture
- May 88 CD PLAYERS (58)
Also includes: Speaker stands
Plus: Focus on Tweaking
- Aug 88 ONE-NAME SYSTEMS (61)
Also includes: CD players
Plus: In-car audio
- Sept 88 AMPLIFIERS (62)
Also includes: In-car audio
Plus: CD players
- Oct 88 CASSETTE DECKS (63)
Also includes: Valve amplifiers
Plus: Headphones
- Nov 88 COMPACT DISC PLAYERS (64) (with free CD)
Also includes: Digital amplifiers
Plus: Loudspeaker cables
- Dec 88 CD MIDI SYSTEMS (65)
Also includes: Floor standing loudspeakers
Plus: Tuners
- March 89 AMPLIFIERS (68)
Also includes: Loudspeakers
Plus: High-end in-car audio
- April 89 CASSETTE DECKS (69)
Also includes: Cassette tapes
Plus: Tweaking tactics
- May 89 CD PLAYERS (70)
Also includes: Satellite and subwoofer loudspeakers
Plus: Receivers
- June 89 LOUDSPEAKERS (71) (with free speaker supplement)
Also includes: Hi-fi VCRs
Plus: Radio Caroline
- July 89 THE COLLECTION (72) (with free Rock supplement)
Includes: Reviews of state of the art equipment
Plus: High end Aspirations
- Aug 89 SEPARATE SYSTEMS (73) (with free cable labels)
Also includes: Yuppie Blasters
Plus: Studer C37 rebuild, part one

- Sept 89 AMPLIFIERS (74) (with free Jazz supplement)
Also includes: Miniature loudspeakers
Plus: Focus on CD testing
- Oct 89 CASSETTE DECKS (75)
Also includes: Headphones
Plus: Studer C37 rebuild, part two
- Nov 89 CD PLAYERS (76) (with free Classical supplement)
Also includes: Nicam televisions
Plus: TV technology explained
- Dec 89 CD MIDI SYSTEMS (77)
Also includes: Valve amplifiers
Plus: Multi-bit and bitstream DAC technology explained
- Jan 90 LOUDSPEAKERS (78) (with free Collectables supp.)
Also includes: Personal Cassettes
Plus: Valve amplifiers
- Feb 90 TURNTABLES AND TONEARMS (79)
Also includes: Dolby Pro-Logic explained
Plus: Focus On Ortofon MC3000mkII
- Mar 90 AMPLIFIERS (80)
Also includes: Tweaking ideas
Plus: Statements... on the High-end
- COMING SOON**
- Apr 90 CASSETTE DECKS (81)
- May 90 LOUDSPEAKERS (82)
- June 90 CD PLAYERS (83)

Individual issues including postage and packing: UK £3.50, rest of the world £4.25 (air service)

TO ORDER BINDERS:

Keep your copies of *Hi-Fi Choice* in prime condition with our 8-issue binder finished in black and gold. £5.95 (UK), £7.95 (air service) inc. postage and packing

PAYMENT

I enclose my cheque/Post Order made payable to *Dennis Publishing Ltd.*

Please charge my Access/Visa (delete as appropriate)

Credit card number _____ Expiry date _____

Signature _____

Name _____

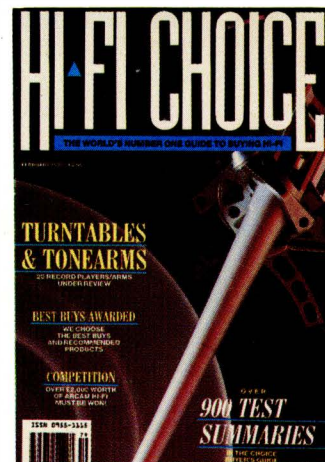
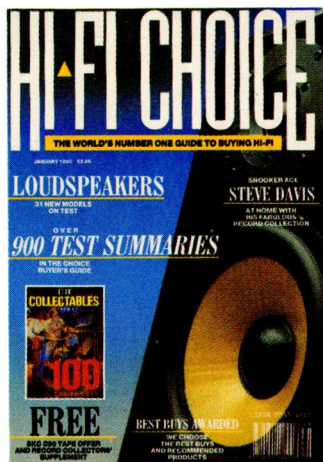
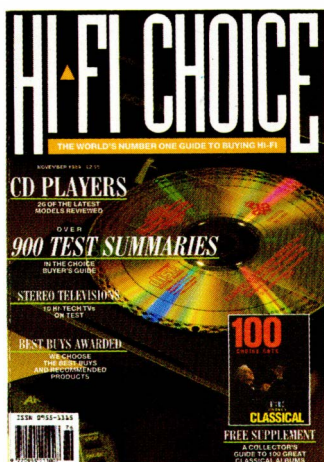
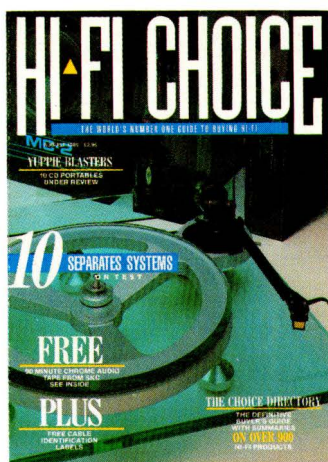
Address _____

Postcode _____

(80) Please send order form and payment to: **Hi-Fi Choice, Mail Order, P.O. Box 320, London N21 2NB.**

BACK ISSUES

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



TO ORDER BACK ISSUES:

- Please tick those you require
- Feb 88 TURNTABLES & TONEARMS (55)
Also includes: Tuners
Plus: Headphones
- March 88 AMPLIFIERS (56)
Also includes: Cassette tapes
Plus: Personal stereos
- April 88 CASSETTE DECKS (57)
Also includes: Valve amplifiers
Plus: Hi-fi furniture
- May 88 CD PLAYERS (58)
Also includes: Speaker stands
Plus: Focus on Tweaking
- Aug 88 ONE-NAME SYSTEMS (61)
Also includes: CD players
Plus: In-car audio
- Sept 88 AMPLIFIERS (62)
Also includes: In-car audio
Plus: CD players
- Oct 88 CASSETTE DECKS (63)
Also includes: Valve amplifiers
Plus: Headphones
- Nov 88 COMPACT DISC PLAYERS (64) (with free CD)
Also includes: Digital amplifiers
Plus: Loudspeaker cables
- Dec 88 CD MIDI SYSTEMS (65)
Also includes: Floor standing loudspeakers
Plus: Tuners
- March 89 AMPLIFIERS (68)
Also includes: Loudspeakers
Plus: High-end in-car audio
- April 89 CASSETTE DECKS (69)
Also includes: Cassette tapes
Plus: Tweaking tactics
- May 89 CD PLAYERS (70)
Also includes: Satellite and subwoofer loudspeakers
Plus: Receivers
- June 89 LOUDSPEAKERS (71) (with free speaker supplement)
Also includes: Hi-fi VCRs
Plus: Radio Caroline
- July 89 THE COLLECTION (72) (with free Rock supplement)
Includes: Reviews of state of the art equipment
Plus: High end Aspirations
- Aug 89 SEPARATE SYSTEMS (73) (with free cable labels)
Also includes: Yuppie Blasters
Plus: Studer C37 rebuild, part one

- Sept 89 AMPLIFIERS (74) (with free Jazz supplement)
Also includes: Miniature loudspeakers
Plus: Focus on CD testing
- Oct 89 CASSETTE DECKS (75)
Also includes: Headphones
Plus: Studer C37 rebuild, part two
- Nov 89 CD PLAYERS (76) (with free Classical supplement)
Also includes: Nicam televisions
Plus: TV technology explained
- Dec 89 CD MIDI SYSTEMS (77)
Also includes: Valve amplifiers
Plus: Multi-bit and bitstream DAC technology explained
- Jan 90 LOUDSPEAKERS (78) (with free Collectables supp.)
Also includes: Personal Cassettes
Plus: Valve amplifiers
- Feb 90 TURNTABLES AND TONEARMS (79)
Also includes: Dolby Pro-Logic explained
Plus: Focus On Ortofon MC3000MkII
- Mar 90 AMPLIFIERS (80)
Also includes: Tweaking ideas
Plus: Statements . . . on the High-end
- COMING SOON**
- Apr 90 CASSETTE DECKS (81)
- May 90 LOUDSPEAKERS (82)
- June 90 CD PLAYERS (83)

Individual issues including postage and packing: UK £3.50, rest of the world £4.25 (air service)

TO ORDER BINDERS:

Keep your copies of *Hi-Fi Choice* in prime condition with our 8-issue binder finished in black and gold. £5.95 (UK), £7.95 (air service) inc. postage and packing

PAYMENT

I enclose my cheque/Post Order made payable to *Dennis Publishing Ltd.*

Please charge my Access/Visa (delete as appropriate)

Credit card number _____ Expiry date _____

Signature _____

Name _____

Address _____

Postcode _____

(80) Please send order form and payment to: **Hi-Fi Choice, Mail Order, P.O. Box 320, London N21 2NB.**

AKG
ACOUSTICS

PICTURE
~
PERFECT
~
SOUND



Perfect sound is subjective, influenced by your favourite recordings and your hifi system, carefully assembled from individually chosen components. Since no two listeners have the same conception of what is perfect or nearly so, AKG, who are a world leader in broadcast and recording studio equipment design, have developed a diverse range of headphones incorporating differing acoustic and physical design features. Now you are able to buy headphones that will satisfy your own personal listening criteria, both for your treasured vinyl recordings and the newest compact discs. Whatever the scribes prescribe, the final choice is yours.

Don't make it without listening to AKG headphones first.

K 145 / S

Advanced electrostatic plus dynamic twin capsule principle ~ Dynamic 'woofer' delivers high energy bass, and electrostatic 'tweeter' a detailed high end.



K 240 MONITOR

Probably our most consistent best seller to 'serious' listeners, due to its exceptional performance and wide dynamic range. Very comfortable too.

K 280 PARABOLIC

Twin capsules in each earpiece focus the sound parabolically into the ear canal for acoustic efficiency. High levels of performance and comfort.



AKG Acoustics Ltd., Vienna Court, Lammas Road,
Godalming, Surrey GU7 1JG.



Telephone (04868) 25702. Facsimile (04868) 28967.
Telex 859013 AKGMIC G.

READING HI FI CENTRE

▶ At Reading Hi-Fi Centre we cater for the interests of every type of music lover from the most sophisticated Hi Fi enthusiast to the first-timer coming to enjoy this superior listening experience.

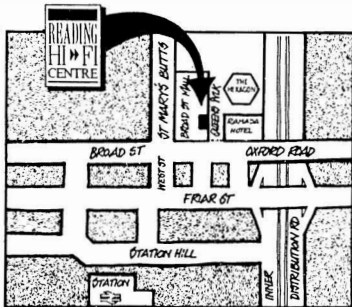
Our helpful staff have sound product knowledge and our comfortable demonstration rooms offer excellent conditions for you to hear quality Hi Fi at its best.

Listen to us and buy a better system.

Home demonstrations can be arranged in most cases and when you have decided on the right system, we will be happy to install it to our own high standards.

· AIWA · ARCAM
· AUDIOLAB · AURA · BEYER
CAMBRIDGE AUDIO · CELEF · CELESTION
CREEK · EPOS · EXPOSURE · FINESTRA
GOLDRING · HEYBROOK · LINN PRODUCTS
MARANTZ · MERIDIAN · MICHELL · MUSICAL
FIDELITY · NAKAMICHI · PHILIPS · PRO-AC
Q.E.D. · QUAD · RADFORD · REGA RESEARCH
REVOX · ROGERS · ROKSAN · ROTEL · ROYD
SENNHEISER · SME · SONY ES ·
STAX · TOWNSEND ·
YAMAHA

You'll find us in Queens Walk on Reading's Broad Street Mall, between Heals and the Ramada Hotel near the Hexagon.



READING HI FI CENTRE
4 Queens Walk, Broad Street Mall,
Reading RG1 7QF
Tel: (0734) 585463

Opening Hours: Tuesday-Saturday: 10am-6pm
(Lunch 2 to 3pm Except Saturday)

CLOSED ALL DAY MONDAY
OPEN THURSDAY TILL 8PM

DEMONSTRATION APPOINTMENTS ADVISED

SONY HI-FI NEWS
RECORDS REGIONAL WINNER
Dealer Awards
1988

BDA
THE ULTIMATE IN
SOUND ADVICE

SONY HI-FI NEWS
RECORDS REGIONAL WINNER
Dealer Awards
1989

DON'T MISS NEXT MONTH'S ISSUE OF

HI-FI CHOICE

PACKED WITH IN-DEPTH REVIEWS!



20 CASSETTE DECKS ON TEST

Including the latest from
Akai, Denon, Marantz, Philips and
many others.

PLUS...

5 floorstanding loudspeakers under review

AND

Aspirations looks at a Revox throughout-the-
house system.

PLUS...

NEWS, VIEWS, AND MUCH, MUCH MORE.

HI-FI CHOICE

APRIL ISSUE ON SALE MARCH 9th

READING HI-FI CENTRE

▶ At Reading Hi-Fi Centre we cater for the interests of every type of music lover from the most sophisticated Hi Fi enthusiast to the first-timer coming to enjoy this superior listening experience.

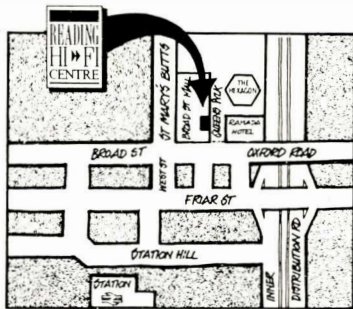
Our helpful staff have sound product knowledge and our comfortable demonstration rooms offer excellent conditions for you to hear quality Hi Fi at its best.

Listen to us and buy a better system.

Home demonstrations can be arranged in most cases and when you have decided on the right system, we will be happy to install it to our own high standards.

• AIWA • ARCAM
• AUDIOLAB • AURA • BEYER
CAMBRIDGE AUDIO • CELEF • CELESTION
CREEK • EPOS • EXPOSURE • FINESTRA
GOLDRING • HEYBROOK • LINN PRODUCTS
MARANTZ • MERIDIAN • MICHELL • MUSICAL
FIDELITY • NAKAMICHI • PHILIPS • PRO-AC
Q.E.D. • QUAD • RADFORD • REGA RESEARCH
REVOX • ROGERS • ROKSAN • ROTEL • ROYD
SENNHEISER • SME • SONY ES •
STAX • TOWNSEND •
YAMAHA •

You'll find us in Queens Walk on Reading's Broad Street Mall, between Heals and the Ramada Hotel near the Hexagon.



READING HI-FI CENTRE

4 Queens Walk, Broad Street Mall,
Reading RG1 7QF
Tel: (0734) 585463

Opening Hours: Tuesday-Saturday: 10am-6pm
(Lunch 2 to 3pm Except Saturday)

CLOSED ALL DAY MONDAY

OPEN THURSDAY TILL 8PM

DEMONSTRATION APPOINTMENTS ADVISED



DON'T MISS NEXT MONTH'S ISSUE OF

HI-FI CHOICE

PACKED WITH IN-DEPTH REVIEWS!



20 CASSETTE DECKS ON TEST

Including the latest from
Akai, Denon, Marantz, Philips and
many others.

PLUS ...

5 floorstanding loudspeakers under review

AND

Aspirations looks at a Revox throughout-the-
house system.

PLUS ...

NEWS, VIEWS, AND MUCH, MUCH MORE.

HI-FI CHOICE

APRIL ISSUE ON SALE MARCH 9th



CHOICE SESSIONS

Things we hear . . . This month, Stereophile magazine's home-brewed audiophile LP, thoughts on the best type of cables for digital transmission, and Dynavector's forgotten gem – the 17D2 'Karat Diamond'.

AUDIOPHILE POETRY

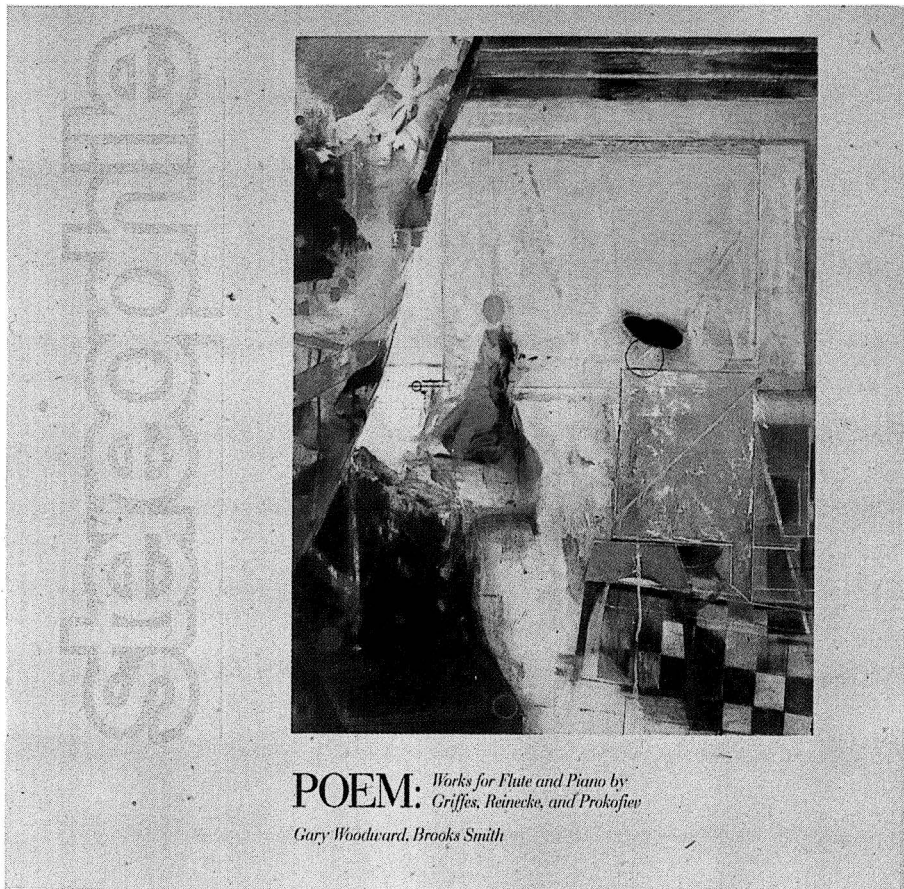
Top-quality LPs are becoming increasingly rare. So US 'underground' magazine Stereophile decided to make its own. John Bamford reports . . .

"We at *Stereophile* magazine have always wanted to make as natural-sounding a recording as it is possible to make. Now we've done it. We're proud to present *Poem: Works for Flute and Piano*." So began the letter accompanying the LP which arrived at our office just before Christmas.

Stereophile, some of you may know, is an 'underground' magazine for serious audiophiles published from offices in Santa Fe, New Mexico. Its editor is John Atkinson who, before emigrating Stateside, used to be editor of *Hi-Fi News & Record Review*. Some of the articles in *Stereophile* make for good reading for dedicated hi-fi fanatics, and a few British audiophiles do subscribe to the magazine even though much of its commentary applies specifically to American products, many of which are not available in this country.

What *Stereophile's* editorial team has done, with the help of friends and acquaintances, is to organise the recording of a selection of musical pieces played by Gary Woodward (flute) and Brooks Smith (piano). These are purist audiophile recordings using, on some tracks, *The Mic* figure-of-eight valve microphones manufactured by England's Esoteric Audio Research (they of the valve amplifiers, whose designer is Tim de Paravicini), and on other tracks Milab LC25 transformerless cardoids. An Ampex MR70 valve tape recorder was used (half-inch tape, running at 15ips), fed by an EAR tube microphone preamp, and during the recording sessions the sound was carefully monitored using Stax headphones.

Unlike modern commercial recordings, the music was recorded directly on to the tape without using any form of noise reduction or equalisation gadgetry which might degrade the purity of the natural sound captured by the microphones. This minimalist purity – the intention is that you should hear nothing but the pure, natural sound of the instruments playing in the hall – is the approach for which Altarus Records in this country is so famous. What we're hearing from this type of record is down to the placement of the microphones, the sound 'character' of the tape recorder itself, and the inevitable degradations caused by the act of transferring the music signal from the master tape through the head of the cutting lathe on to a lacquer disc (this is the 'mastering' process), and subsequent pressing on vinyl LPs.



POEM: *Works for Flute and Piano by Griffes, Reinecke, and Prokofiev*
Gary Woodward, Brooks Smith

To get the best possible transfer from master tape to lacquer they have used the best mastering facility in the business – The Exchange studios in London which, until a management buy-out a few years ago, used to be owned by Island Records and went by the name of the Sound Clinic. Here they use 600watts of customised EAR valve amplifiers per channel to drive the cutter head! Again, there are parallels with Altarus which these days always insists on using The Exchange to cut its discs.

The music on *Poem* comprises a selection of compositions by Griffes, Reinecke and Prokofiev, delightfully played by Smith and Woodward. The sound, if you've not heard this type of audiophile recording before, might come as something of a culture shock. Unlike the overtly detailed and up-front sound which emanates from your system's loudspeakers when you play a commercial record, the sound here might be regarded as too distant and wholly undramatic. But just sit back and close your eyes and it takes but a couple of minutes to realise that what you're hearing from this type of recording is natural sound – the sound you'd expect to hear if you were sitting in the concert hall. You can 'feel'

Musical moments captured 'live' by some of the best analogue recording gear in the world.

the air reverberating in the auditorium and hear the 'acoustic'. And recordings like this are wonderful tools for assessing the fidelity of hi-fi systems.

As an aside, I see from the very comprehensive liner notes on the gatefold sleeve that the folks at *Stereophile* were concerned that we all rely on recordings (whether on LP or CD) to judge the faithfulness of hi-fi components when in fact we can never be sure how the recordings were made and what they should sound like. So where is our reference point? How can we make absolute value judgements on hi-fi systems when we don't really know what the original musical performance sounded like because we weren't in the auditorium when the recording was made? It is for this very reason that we had Richard Black test record players for us in last month's *Turntables* issue. Because Richard is closely involved with Altarus Records, he was able to listen to records which he has helped engineer; he knows what the piano sounded like in the venue, and he was able to refer to Altarus' original



CHOICE SESSIONS

Things we hear . . . This month, Stereophile magazine's home-brewed audiophile LP, thoughts on the best type of cables for digital transmission, and Dynavector's forgotten gem – the 17D2 'Karat Diamond'.

AUDIOPHILE POETRY

Top-quality LPs are becoming increasingly rare. So US 'underground' magazine Stereophile decided to make its own. John Bamford reports . . .

"We at *Stereophile* magazine have always wanted to make as natural-sounding a recording as it is possible to make. Now we've done it. We're proud to present *Poem: Works for Flute and Piano*." So began the letter accompanying the LP which arrived at our office just before Christmas.

Stereophile, some of you may know, is an 'underground' magazine for serious audiophiles published from offices in Santa Fe, New Mexico. Its editor is John Atkinson who, before emigrating Stateside, used to be editor of *Hi-Fi News & Record Review*. Some of the articles in *Stereophile* make for good reading for dedicated hi-fi fanatics, and a few British audiophiles do subscribe to the magazine even though much of its commentary applies specifically to American products, many of which are not available in this country.

What *Stereophile's* editorial team has done, with the help of friends and acquaintances, is to organise the recording of a selection of musical pieces played by Gary Woodward (flute) and Brooks Smith (piano). These are purist audiophile recordings using, on some tracks, *The Mic* figure-of-eight valve microphones manufactured by England's Esoteric Audio Research (they of the valve amplifiers, whose designer is Tim de Paravicini), and on other tracks Milab LC25 transformerless cardoids. An Ampex MR70 valve tape recorder was used (half-inch tape, running at 15ips), fed by an EAR tube microphone preamp, and during the recording sessions the sound was carefully monitored using Stax headphones.

Unlike modern commercial recordings, the music was recorded directly on to the tape without using any form of noise reduction or equalisation gadgetry which might degrade the purity of the natural sound captured by the microphones. This minimalist purity – the intention is that you should hear nothing but the pure, natural sound of the instruments playing in the hall – is the approach for which Altarus Records in this country is so famous. What we're hearing from this type of record is down to the placement of the microphones, the sound 'character' of the tape recorder itself, and the inevitable degradations caused by the act of transferring the music signal from the master tape through the head of the cutting lathe on to a lacquer disc (this is the 'mastering' process), and subsequent pressing on vinyl LPs.



To get the best possible transfer from master tape to lacquer they have used the best mastering facility in the business – The Exchange studios in London which, until a management buy-out a few years ago, used to be owned by Island Records and went by the name of the Sound Clinic. Here they use 600watts of customised EAR valve amplifiers per channel to drive the cutter head! Again, there are parallels with Altarus which these days always insists on using The Exchange to cut its discs.

The music on *Poem* comprises a selection of compositions by Griffes, Reinecke and Prokofiev, delightfully played by Smith and Woodward. The sound, if you've not heard this type of audiophile recording before, might come as something of a culture shock. Unlike the overtly detailed and up-front sound which emanates from your system's loudspeakers when you play a commercial record, the sound here might be regarded as too distant and wholly undramatic. But just sit back and close your eyes and it takes but a couple of minutes to realise that what you're hearing from this type of recording is natural sound – the sound you'd expect to hear if you were sitting in the concert hall. You can 'feel'

Musical moments captured 'live' by some of the best analogue recording gear in the world.

the air reverberating in the auditorium and hear the 'acoustic'. And recordings like this are wonderful tools for assessing the fidelity of hi-fi systems.

As an aside, I see from the very comprehensive liner notes on the gatefold sleeve that the folks at *Stereophile* were concerned that we all rely on recordings (whether on LP or CD) to judge the faithfulness of hi-fi components when in fact we can never be sure how the recordings were made and what they should sound like. So where is our reference point? How can we make absolute value judgements on hi-fi systems when we don't really know what the original musical performance sounded like because we weren't in the auditorium when the recording was made? It is for this very reason that we had Richard Black test record players for us in last month's *Turntables* issue. Because Richard is closely involved with Altarus Records, he was able to listen to records which he has helped engineer; he knows what the piano sounded like in the venue, and he was able to refer to Altarus' original

master tapes when assessing the ultimate accuracy of various turntables and tonearms.

Another point of interest, particularly for enthusiasts who would like to build up a collection of naturally-recorded music, is that this excellent *Stereophile* LP has been engineered by Kavi Alexander who runs a specialist record company in the States called Water Lily Acoustics. Water Lily has made several recordings for some highly respected US hi-fi manufacturers, including the fabulous *Paganiniana* recording which was sponsored by Conrad-Johnson, and which can now be purchased from our mail order department. See page 43 in this issue for full details. *Paganiniana* also features Brooks Smith on piano, here coupled with Ruggiero Ricci on violin. Like *Stereophile's Poem*, it's a recording to treasure.

TRANSMITTING THE DATA

When using a CD player's coaxial digital output, many high quality interconnect cables are unsuitable. Paul Miller explains.

Alongside their conventional (analogue) output sockets, almost all current CD players are equipped with a digital output. The digital output may not be used directly, but gives access to the digital datastream before it reaches a CD player's internal DAC (digital-to-analogue converter). So, by connecting this digital output to an external D-to-A converter of superior quality a new avenue for upgrading is made available.

At present only a handful of affordable stand alone D-to-A converters are obtainable on the market, including the *Black Box* from Arcam, Musical Fidelity's *Digilog* and the brand new *PDM One* from Deltec Precision Audio. However, there are a large number of preamps and integrated amplifiers around that also play host to an on-board DAC. As such they may be linked directly to the digital output of any CD player or high quality CD transport (such as Kenwood's *DP-X9010* and the Arcam *Delta 170*).

Many players now feature both Toslink (optical) and coaxial (electrical) digital outputs, both offering the same digital information albeit transmitted by different methods. The respective pros and cons of coaxial versus optical digital outputs is a complex enough topic in itself. As a result this brief discussion is concerned solely with the effects caused by various audio cables which may be pressed into service as digital interconnects.

From the outset it is very important to appreciate that not all standard audio interconnect cables will provide a suitable link between a CD player's digital output and converter's digital input. Indeed, different cables will influence sound quality by corrupting the transmitted digital data. However, any differences in sound quality cannot be predicted from taking into account the performance of an interconnect cable when used in a 'conventional' analogue hi-fi system.

In other words, purchasing a costly high-end audio interconnect cable for use as a digital link is no guarantee of optimum performance. The principal reason for this lies in the contrasting demands placed on a cable by a conventional 20Hz-20kHz audio signal and the very high frequency (RF) signals that emanate from a digital output. Just because a cable works well in one domain does not imply it will be equally successful in another.

Let's look a little closer at the digital output of a CD player and discover what type of interconnect cables will be best suited for the job. First the digital output of all CD players adheres to an agreed standard and is transmitted in what is known as a biphasemark code. A logic '1' is identified by two transitions (up/down pulse) that are half the pulse width of the single transition used to denote a logic '0'. Blocks of 384 32-bit words are used, each separated by a 4-bit sync word that is identified as a violation of the biphasemark code.

The shortest transition period is equal to 177nsecs which is equivalent to the standard 1²S bit rate of 5.6448MHz – far removed from the audio band! Furthermore, in order to transmit accurately a squarewave pulse of this fundamental frequency the cable should be linear up to 50 or 60MHz, which is firmly in the RF spectrum.

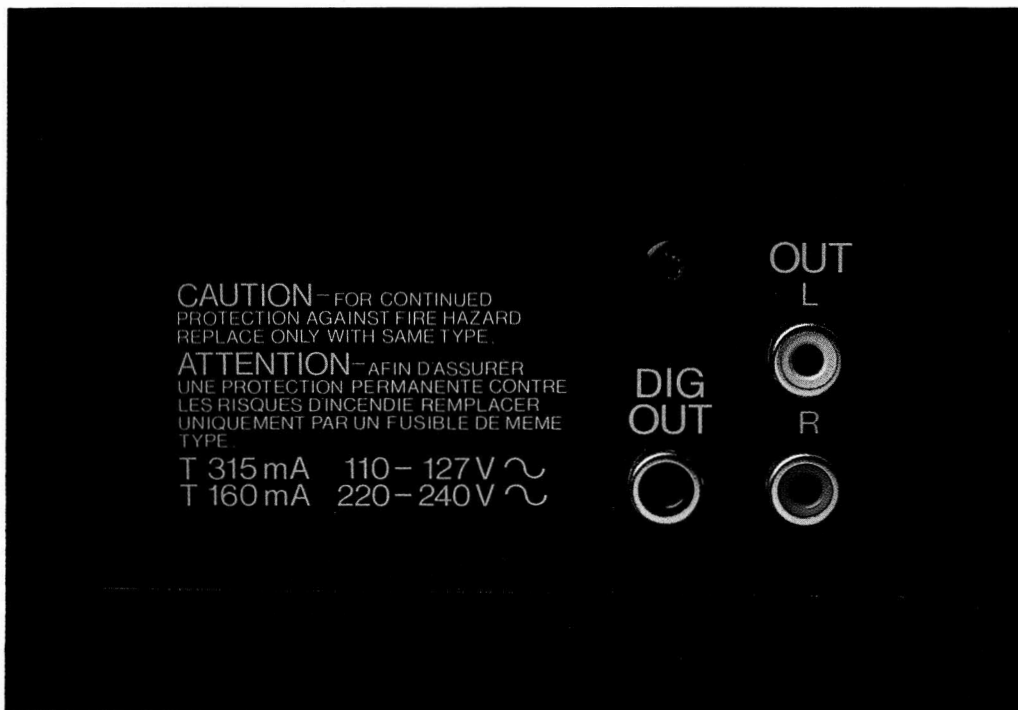
Once we begin to consider a cable's effectiveness at conveying RF power we must look at the interconnect as a transmission line. Here the resistance, inductance, capaci-

tance and leakage per metre along the line will determine the cable's surge characteristic impedance. The characteristic impedance of a cable is the theoretical input impedance it would present if the cable were infinitely long.

In practice the cable or 'line' need only be terminated with a resistive load equal to that of the line's characteristic impedance. When this condition is satisfied the line is said to be 'matched' to the load and the pulses of voltage and current remain in-phase down the length of the line until the RF power is subsequently absorbed by the load.

In our case the characteristic impedance of the interconnect cable needs to match the output and input impedance of the CD player and DAC respectively, that is 75ohm. If the 'line' is not matched by a load equal to its characteristic impedance (or vice-versa) then the digital datastream (RF signal) will only be partially absorbed by the load (DAC) and a certain percentage of the signal will be reflected back to the digital output. Standing waves of voltage and current (our datastream) are created along the interconnect if it falls into this category of an 'unmatched line'.

Theoretically any reflection of the digital datastream will introduce pulse distortion and affect the timing between consecutive logic transitions. The recovery of clock data in the DAC will be degraded by this jitter-like effect and, like any corruption of the datastream, will eventually have a subjective consequence. Other considerations include an



If you think it doesn't matter which type of cable is used for transmitting digital data to an outboard D-to-A converter, think again...

increase in dielectric loss and non-linear conduction with increasing frequency (up to 50-60MHz) due to the skin effect, and data corruption due to radiation and induction.

It's possible to calculate the characteristic impedance of an interconnect cable because all the aforementioned factors are directly related to the materials used and geometry of the cable's construction. For instance the self-inductance (which influences the surrounding magnetic field) and capacitance (which determines the electric field between the conductors) both dictate the line's performance in respect of frequency.

master tapes when assessing the ultimate accuracy of various turntables and tonearms.

Another point of interest, particularly for enthusiasts who would like to build up a collection of naturally-recorded music, is that this excellent *Stereophile* LP has been engineered by Kavi Alexander who runs a specialist record company in the States called Water Lily Acoustics. Water Lily has made several recordings for some highly respected US hi-fi manufacturers, including the fabulous *Paganiniana* recording which was sponsored by Conrad-Johnson, and which can now be purchased from our mail order department. See page 43 in this issue for full details. *Paganiniana* also features Brooks Smith on piano, here coupled with Ruggiero Ricci on violin. Like *Stereophile's Poem*, it's a recording to treasure.

TRANSMITTING THE DATA

When using a CD player's coaxial digital output, many high quality interconnect cables are unsuitable. Paul Miller explains.

Alongside their conventional (analogue) output sockets, almost all current CD players are equipped with a digital output. The digital output may not be used directly, but gives access to the digital datastream before it reaches a CD player's internal DAC (digital-to-analogue converter). So, by connecting this digital output to an external D-to-A converter of superior quality a new avenue for upgrading is made available.

At present only a handful of affordable stand alone D-to-A converters are obtainable on the market, including the *Black Box* from Arcam, Musical Fidelity's *Digilog* and the brand new *PDM One* from Deltec Precision Audio. However, there are a large number of preamps and integrated amplifiers around that also play host to an on-board DAC. As such they may be linked directly to the digital output of any CD player or high quality CD transport (such as Kenwood's *DP-X9010* and the Arcam *Delta 170*).

Many players now feature both Toslink (optical) and coaxial (electrical) digital outputs, both offering the same digital information albeit transmitted by different methods. The respective pros and cons of coaxial versus optical digital outputs is a complex enough topic in itself. As a result this brief discussion is concerned solely with the effects

caused by various audio cables which may be pressed into service as digital interconnects.

From the outset it is very important to appreciate that not all standard audio interconnect cables will provide a suitable link between a CD player's digital output and converter's digital input. Indeed, different cables will influence sound quality by corrupting the transmitted digital data. However, any differences in sound quality cannot be predicted from taking into account the performance of an interconnect cable when used in a 'conventional' analogue hi-fi system.

In other words, purchasing a costly high-end audio interconnect cable for use as a digital link is no guarantee of optimum performance. The principal reason for this lies in the contrasting demands placed on a cable by a conventional 20Hz-20kHz audio signal and the very high frequency (RF) signals that emanate from a digital output. Just because a cable works well in one domain does not imply it will be equally successful in another.

Let's look a little closer at the digital output of a CD player and discover what type of interconnect cables will be best suited for the job. First the digital output of all CD players adheres to an agreed standard and is transmitted in what is known as a biphasemark code. A logic '1' is identified by two transitions (up/down pulse) that are half the pulse width of the single transition used to denote a logic '0'. Blocks of 384 32-bit words are used, each separated by a 4-bit sync word that is identified as a violation of the biphasemark code.

The shortest transition period is equal to 177nsecs which is equivalent to the standard 1²S bit rate of 5.6448MHz – far removed from the audio band! Furthermore, in order to transmit accurately a squarewave pulse of this fundamental frequency the cable should be linear up to 50 or 60MHz, which is firmly in the RF spectrum.

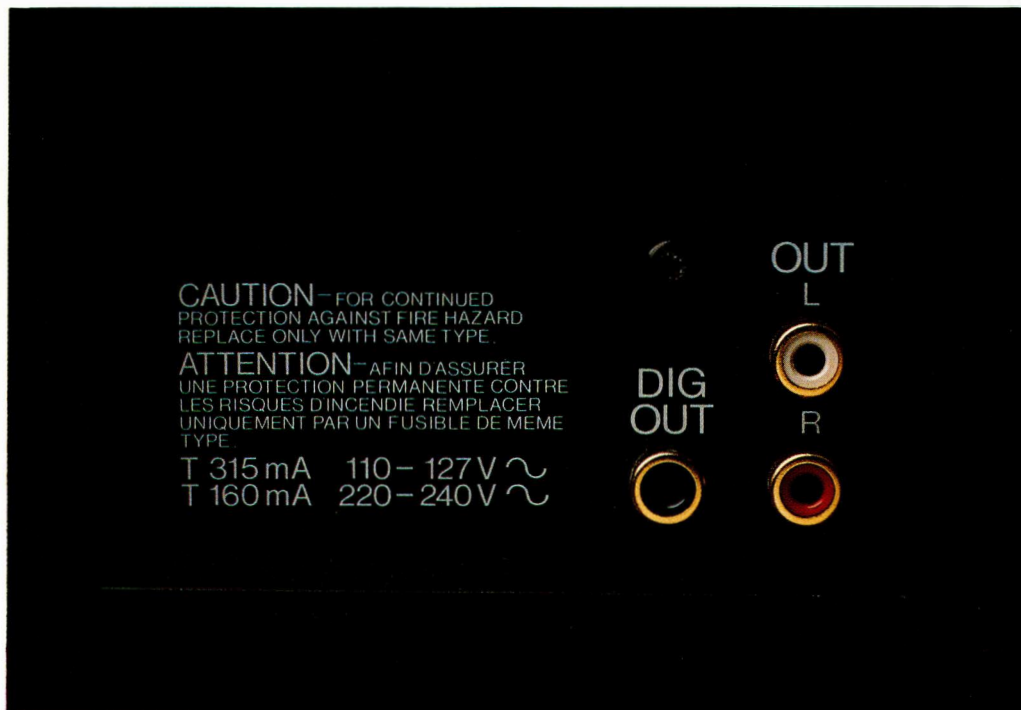
Once we begin to consider a cable's effectiveness at conveying RF power we must look at the interconnect as a transmission line. Here the resistance, inductance, capaci-

tance and leakage per metre along the line will determine the cable's surge characteristic impedance. The characteristic impedance of a cable is the theoretical input impedance it would present if the cable were infinitely long.

In practice the cable or 'line' need only be terminated with a resistive load equal to that of the line's characteristic impedance. When this condition is satisfied the line is said to be 'matched' to the load and the pulses of voltage and current remain in-phase down the length of the line until the RF power is subsequently absorbed by the load.

In our case the characteristic impedance of the interconnect cable needs to match the output and input impedance of the CD player and DAC respectively, that is 75ohm. If the 'line' is not matched by a load equal to its characteristic impedance (or vice-versa) then the digital datastream (RF signal) will only be partially absorbed by the load (DAC) and a certain percentage of the signal will be reflected back to the digital output. Standing waves of voltage and current (our datastream) are created along the interconnect if it falls into this category of an 'unmatched line'.

Theoretically any reflection of the digital datastream will introduce pulse distortion and affect the timing between consecutive logic transitions. The recovery of clock data in the DAC will be degraded by this jitter-like effect and, like any corruption of the datastream, will eventually have a subjective consequence. Other considerations include an



If you think it doesn't matter which type of cable is used for transmitting digital data to an outboard D-to-A converter, think again . . .

increase in dielectric loss and non-linear conduction with increasing frequency (up to 50-60MHz) due to the skin effect, and data corruption due to radiation and induction.

It's possible to calculate the characteristic impedance of an interconnect cable because all the aforementioned factors are directly related to the materials used and geometry of the cable's construction. For instance the self-inductance (which influences the surrounding magnetic field) and capacitance (which determines the electric field between the conductors) both dictate the line's performance in respect of frequency.

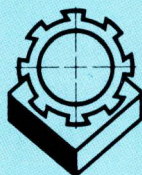
Aylesbury Hi-Fidelity



Stockists of:

AKG	Monster
Alphason	Nagaoka
AR	NVA
A&R	NAD
Ariston	Nitty Gritty
Audio Technica	Onkyo
BLQ	Ortofon
Cambridge Audio	Proac
Celef	QED
Celestion	Rotel
Denon	Revox
Dual	Revolver
Exposure	Rogers
Gale	Royd Audio
Goldring	Roksan
Goodmans	Sennheiser
Grado	Something Solid
Gyrodek	Spendor
Heybrook	Systemdek
Harman Kardon	Tannoy
KEF	Target
Lynx	Teac
Modsquad	Thorens
Monitor Audio	Townshend
Michell	van den Hul
Mantra	Wharfedale
Musical Fidelity	Yamaha
Mordaunt Short	Zeta
Marantz	

ROKSAN XERXES



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



'87
WINNER



Dealer Awards
1988
NOMINEE

SEVEN DAY EXCHANGE
PART EXCHANGE
HOME DEMONSTRATION
SERVICE FACILITIES
EXPERT INSTALLATIONS
MAIL ORDER & EXPORT
SERVICES

THE REAL HI-FI SPECIALISTS IN BUCKINGHAMSHIRE



Licensed
Credit
Broker.
Finance
Available.



HI-FI MARKETS – LICENSED CREDIT BROKER

**98 CAMBRIDGE STREET, AYLESBURY, BUCKS
(0296) 28790**

OPEN 10am – 6pm Monday – Friday, 9.30 – 5.30 Saturday

My early calculations suggest that the surge characteristic impedance of conventional audio interconnects fall in the range of 30-300ohm with most hovering between 40-130ohm. Oddly enough the few proprietary 'digital interconnects' that I've so far come across offer characteristic impedances that are wide of the mark!

Low capacitance/highish inductance interconnects are least suitable because, like a standard 300ohm FM ribbon cable, their characteristic impedance is usually too high. Screening from interference is also poor.

At present your safest bet for connecting a CD player to an outboard D-to-A converter would be to opt for a standard 75ohm coaxial FM download, the sort of cable normally used between a stereo tuner and external FM aerial. Good examples will offer a low dielectric loss, excellent screening (try to find a coax with a copper foil screen) and a characteristic impedance very close to the ideal of 75ohm. Such cable is very cheap when compared to the sometimes outrageous prices commanded by high-end audio interconnects. All you have to do is solder on a couple of phono plugs. Try it and drop us a line with your findings.

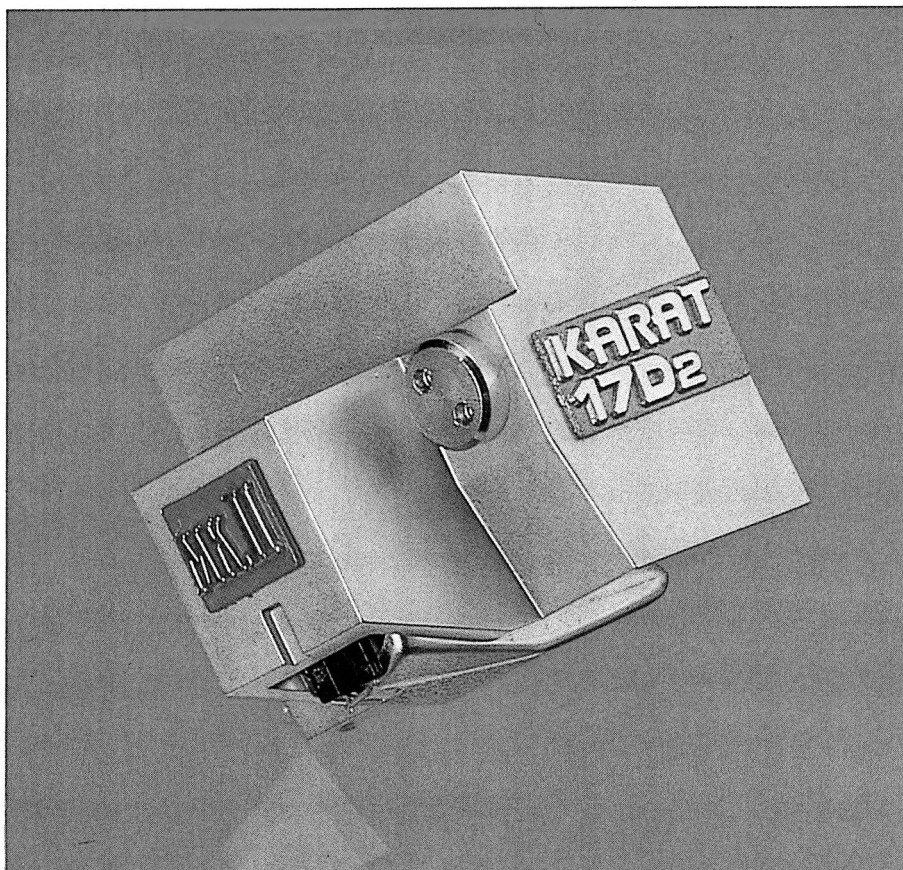
FLAWLESS DIAMOND?

Richard Black auditions a cartridge that's well worth tracking down.

Back in the autumn, when I was starting work on *Choice's* last month's tests on turntables and tonearms (Issue No. 79), I approached Dynavector Systems with a request for a loan of a *Karat Diamond* cartridge. For measurement purposes I wanted a cartridge with a response beyond reproach, and I knew from test results published some time ago in the American *International Audio Review* magazine that the *Karat Diamond* has one of the best frequency responses in the business. Peter Moncrieff's test for IAR showed much-better-than-average audio-band flatness and extension to nearly 100kHz.

In the event, a few quick comparisons between the Dynavector and several other cartridges showed that for my particular tests any old cartridge would do quite nicely – but it's always worth checking these things. However, having got my paws on this unusual beast I would have been daft not to listen to it, and the results were so outstanding we felt it worthwhile writing them up for *Sessions* – especially when Dynavector boss Taro Tominari told me the new price of the cartridge.

The *Karat Diamond* is in fact the old name for the Mk I version, the current model being called the *17D2 MkII*. Essentially, it's a fairly conventional moving coil cartridge, but with one major difference. Instead of a metal or boron pipe for a cantilever, the *17D2* uses a 1.7mm long solid diamond. Diamond is exceptionally stiff and strong, with a relatively low mass and high speed of sound, all properties that make it ideal for cantilever use. Not surprisingly the factors that limit its



applicability are not wholly unrelated to the costs of making and processing the material, and most diamond-cantilevered cartridges are rare and cost £1,000-plus.

The use of such an exotic material in a cantilever may seem excessive, but the proof of this pudding is in the listening. The clarity and precision of sound the *17D2* can produce are about the best I have come across. Various hi-fi products on the market are said to sound 'sweet', which all too often means coloured but dynamic. There's nothing quite as sweet, however, as really neutral, uncoloured and above all fast sound, and only an exceptional transducer can reproduce transients really sweetly, without thudding, clicking or ringing in some way. The *17D2* does this, and comparisons between records and their corresponding master tapes, and between records and real instruments, quite convinced me that it is a top-notch performer.

One very simple 'test' is to listen to surface noise on a record, on the lead-in band and in very quiet passages. On a record in decent condition, the noise should be all but inaudible, but with the very best cartridges there is a quality to the noise that renders it particularly unobtrusive, an effect I can only attribute to lack of coloration and in-band resonance (it also occurs with record decks and arms that are good in this regard). Even on relatively noisy records, the *17D2* keeps the noise and click level as low as any cartridge I have used, an important factor in deciding the cartridge's 'listenability'.

Essentially, what the *17D2* is doing is tracing the grooves accurately (it has a very fine 'Micro-Ridge' stylus profile) and faithfully transferring the information from stylus tip to generator assembly, thanks to the small and stiff cantilever. If the cantilever were to bend and resonate anywhere in or near the audio band, this would not be the case. In addition, the fundamental tip resonance

Dynavector 17D2 MkII: diamond cantilever, micro-ridge stylus and top-notch performance. Price is £280.

(not to be confused with cantilever/arm resonance) is extremely high. This resonance is due to the mass of the stylus/cantilever bouncing on the surface of the record, and is pushed up in frequency by reducing the effective mass of the assembly. In the *17D2*, an effective tip mass around 0.12mg (my estimate) gives a resonance around 80kHz, thus defining the useful bandwidth of the cartridge. More common figures are 0.5mg and 40kHz, but the higher the better in order to minimise audible intermodulation with music signals.

If the Dynavector loses out at all it is in the bass, where I felt slightly happier with my tried and trusted Highphonic *MC-A3*. However, at high frequencies performance is simply stunning, in fact as good as anything I have ever heard, including many of the 'big name' exotica. And the price? Just £280, which appears to make it a fine bargain to start the '90s with.

Dealers stocking Dynavector are not all that common, but if you're after neutrality and precision in your sound system, it's worth tracking one down. It's a great cartridge, and excellent value for money. It is also a perfect antidote (or complement, depending on your point of view) to CD – what more could one want?

My early calculations suggest that the surge characteristic impedance of conventional audio interconnects fall in the range of 30-300ohm with most hovering between 40-130ohm. Oddly enough the few proprietary 'digital interconnects' that I've so far come across offer characteristic impedances that are wide of the mark!

Low capacitance/highish inductance interconnects are least suitable because, like a standard 300ohm FM ribbon cable, their characteristic impedance is usually too high. Screening from interference is also poor.

At present your safest bet for connecting a CD player to an outboard D-to-A converter would be to opt for a standard 75ohm coaxial FM download, the sort of cable normally used between a stereo tuner and external FM aerial. Good examples will offer a low dielectric loss, excellent screening (try to find a coax with a copper foil screen) and a characteristic impedance very close to the ideal of 75ohm. Such cable is very cheap when compared to the sometimes outrageous prices commanded by high-end audio interconnects. All you have to do is solder on a couple of phono plugs. Try it and drop us a line with your findings.

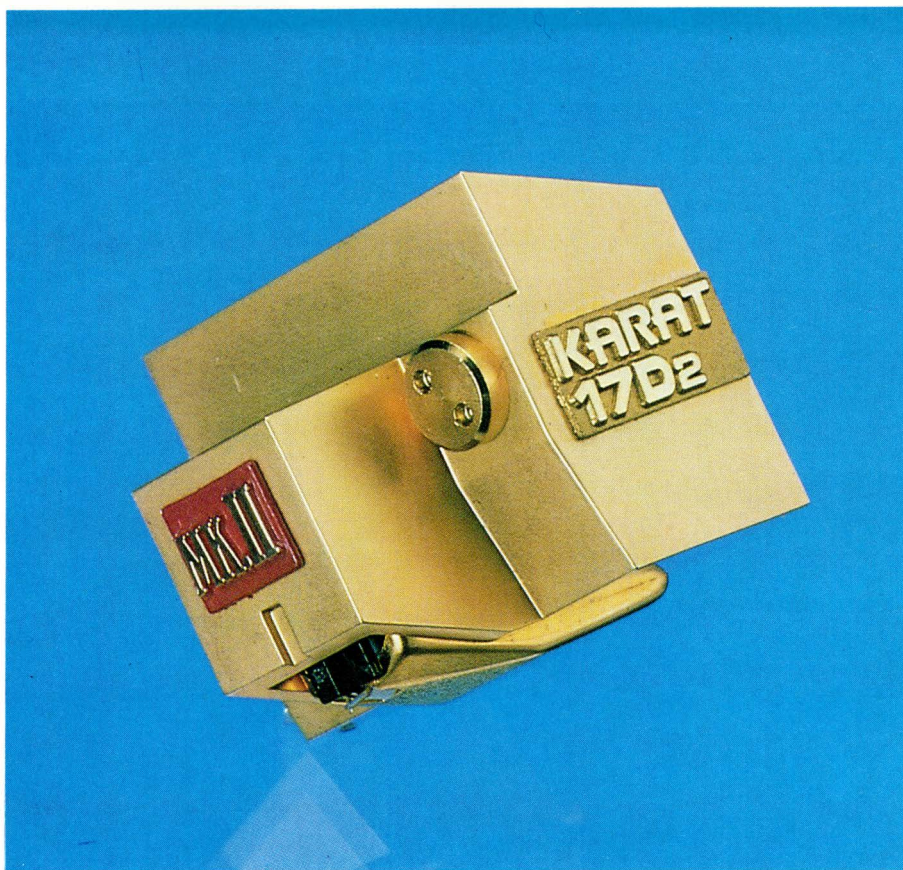
FLAWLESS DIAMOND?

Richard Black auditions a cartridge that's well worth tracking down.

Back in the autumn, when I was starting work on *Choice's* last month's tests on turntables and tonearms (Issue No. 79), I approached Dynavector Systems with a request for a loan of a *Karat Diamond* cartridge. For measurement purposes I wanted a cartridge with a response beyond reproach, and I knew from test results published some time ago in the American *International Audio Review* magazine that the *Karat Diamond* has one of the best frequency responses in the business. Peter Moncrieff's test for IAR showed much-better-than-average audio-band flatness and extension to nearly 100kHz.

In the event, a few quick comparisons between the Dynavector and several other cartridges showed that for my particular tests any old cartridge would do quite nicely – but it's always worth checking these things. However, having got my paws on this unusual beast I would have been daft not to listen to it, and the results were so outstanding we felt it worthwhile writing them up for *Sessions* – especially when Dynavector boss Taro Tominari told me the new price of the cartridge.

The *Karat Diamond* is in fact the old name for the Mk I version, the current model being called the *17D2 MkII*. Essentially, it's a fairly conventional moving coil cartridge, but with one major difference. Instead of a metal or boron pipe for a cantilever, the *17D2* uses a 1.7mm long solid diamond. Diamond is exceptionally stiff and strong, with a relatively low mass and high speed of sound, all properties that make it ideal for cantilever use. Not surprisingly the factors that limit its



applicability are not wholly unrelated to the costs of making and processing the material, and most diamond-cantilevered cartridges are rare and cost \$1,000-plus.

The use of such an exotic material in a cantilever may seem excessive, but the proof of this pudding is in the listening. The clarity and precision of sound the *17D2* can produce are about the best I have come across. Various hi-fi products on the market are said to sound 'sweet', which all too often means coloured but dynamic. There's nothing quite as sweet, however, as really neutral, uncoloured and above all fast sound, and only an exceptional transducer can reproduce transients really sweetly, without thudding, clicking or ringing in some way. The *17D2* does this, and comparisons between records and their corresponding master tapes, and between records and real instruments, quite convinced me that it is a top-notch performer.

One very simple 'test' is to listen to surface noise on a record, on the lead-in band and in very quiet passages. On a record in decent condition, the noise should be all but inaudible, but with the very best cartridges there is a quality to the noise that renders it particularly unobtrusive, an effect I can only attribute to lack of coloration and in-band resonance (it also occurs with record decks and arms that are good in this regard). Even on relatively noisy records, the *17D2* keeps the noise and click level as low as any cartridge I have used, an important factor in deciding the cartridge's 'listenability'.

Essentially, what the *17D2* is doing is tracing the grooves accurately (it has a very fine 'Micro-Ridge' stylus profile) and faithfully transferring the information from stylus tip to generator assembly, thanks to the small and stiff cantilever. If the cantilever were to bend and resonate anywhere in or near the audio band, this would not be the case. In addition, the fundamental tip resonance

Dynavector 17D2 MkII: diamond cantilever, micro-ridge stylus and top-notch performance. Price is £280.

(not to be confused with cantilever/arm resonance) is extremely high. This resonance is due to the mass of the stylus/cantilever bouncing on the surface of the record, and is pushed up in frequency by reducing the effective mass of the assembly. In the *17D2*, an effective tip mass around 0.12mg (my estimate) gives a resonance around 80kHz, thus defining the useful bandwidth of the cartridge. More common figures are 0.5mg and 40kHz, but the higher the better in order to minimise audible intermodulation with music signals.

If the Dynavector loses out at all it is in the bass, where I felt slightly happier with my tried and trusted Highphonic *MC-A3*. However, at high frequencies performance is simply stunning, in fact as good as anything I have ever heard, including many of the 'big name' exotica. And the price? Just £280, which appears to make it a fine bargain to start the '90s with.

Dealers stocking Dynavector are not all that common, but if you're after neutrality and precision in your sound system, it's worth tracking one down. It's a great cartridge, and excellent value for money. It is also a perfect antidote (or complement, depending on your point of view) to CD – what more could one want?

When you buy a CD Player,
don't waste any notes.



There you are. You've settled down with a glass of Muscadet and a dish of olives. You've just spent a painful chunk of your hard-earned salary on your very first compact disc player.

You switch on. You sit back. And what do you get?

Sound so sensational it pins you against the Parker Knoll? Every note as sharp and shattering as

it sprang from Mozart's muse? Well, um, no you don't. Not unless you've been wise enough to invest in the genius of Harman Kardon.

Because the ironic truth is that the conventional compact disc player delivers compact sound. It just doesn't have the technical ability to truly separate out every individual note as it was recorded.

So a distressing proportion of the musician's talent is muffled by the inadequacy of the engineer's.

Which means that the second violin may as well have stayed in the pub. Or the harpist might have been washing her hair. Or Bill Wyman could be snuggled up at home with Mandy.

But the Harman Kardon player represents a major

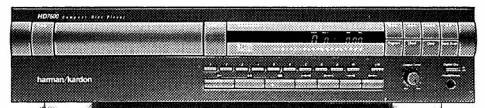


leap in CD science. The mumbo-jumbo behind it is something called Bit-Stream Technology. It's all about a unique process for converting every single piece of the digital information on the disc into the analogue signal that reaches the speaker.

Luckily, there are just two things you need to understand. The first is that Bit-Stream delivers a

musical authenticity that'll send shivers through your ear-lobes. The second is that Harman Kardon is the unchallenged leader in the field.

So if you want to buy a compact disc player, don't waste money on a compact sound. Unless of course you're heavily into the Medici String Trio, Wet Wet - or the Incredible Shrinking Band.



harman/kardon

For further information, please write to
Harman UK Ltd., Mill Street, Slough, Berkshire SL2 5DD.
Tel: (0753) 76911.



ASPIRATIONS

Dan Houston visits Edward Heath, audiophile, at home in Salisbury. Photographs by Colin Clarke.



“You’re a bit early,” the police sergeant spoke through the iron gates at the bottom of the gravel drive, “Mr Heath is still in his pyjamas and he’s just having a boiled egg . . . can you come back in half an hour?”

Edward Heath MBE, MP for Bexley and Sidcup, lives in a quiet corner of Salisbury, opposite its magnificent cathedral. His house, built in the 13th century and extended in the 17th century, was home to a succession of canons of the cathedral and only recently ‘privately’ owned. This is his weekend base, where he can relax from the rigours of representing the pro-European lobby of the Conservatives in parliament. Now 73 years young, he seems as active as ever, championing causes which are close to his heart and treading the world stage as *the* elder British statesman who voices dissent within his own party.

More than any other politician, Mr Heath’s hobbies of yachting and music are well documented. The hallway of his house is hung with oil paintings of the various *Morning Clouds* he skippered and a glittering, mirrored showcase in the vestibule

A Second Skill

is full of scale models of the famously-named racing yachts. At the time of our visit he wore leather yachting pumps – but keeping a boat is now too expensive, he says. Which leaves more time for music . . .

As a conductor his schedule looks reasonably busy (considering this is a kind of moonlit occupation). Speaking before Christmas, he said he was expecting to give a Christmas concert in Bexley; another in Berne in January; two more in May at Canterbury and Salt Lake City and then one across the quad – in the Cathedral – in June. Concerts in the local cathedral are for a special cause: “We’ve got to raise six and a half million pounds for renovation. So I did a concert there in July with the English Chamber Orchestra which raised over £165,000.” He also has leave to play the cathedral organ any time he likes –

“the problem is finding the time”.

It’s less prominent, and probably more relaxing, to listen to the hi-fi which is kept in his library on the ground floor and relayed through to the music room next door. The system was originally installed four years ago when Mr Heath moved into the house and had it completely redecorated. The library is smaller than the music room and box-shaped with a high ceiling. French windows show a stretch of lawn to the back of the house. The room continues the nautical flavour of the hallway with a collection of Japanese wood blocks depicting scenes of junks and harbours. These 60 year old prints are all by one artist and have been collected over the years. Three other prints, of girls, hang over the fireplace and are by another Japanese artist – he’d rather not mention which





















The library (left) houses the record collection and some well-camouflaged bookshelf loudspeakers as well as the hi-fi with piles of tapes and CDs below

– dating from the eighteenth century. Two bookcases carry an extensive collection of records and books on music or musicians as well as fine art. There are a few haphazard piles of CDs and Mr Heath said he was looking for some suitably stylish accommodation for the discs. Look twice and you can see a pair of bookshelf loudspeakers (Spendor *LS3/5a*) which produce a sound belying their size.

The Far Eastern influence is continued with a copy of *Spycatcher* (in Japanese!) on a coffee table and a Sony CD player sitting snugly in one of the bookshelves. This is the newest component of the set-up and had only just been bought. Mr Heath had used a CD player for four years before this and said the differences (improvements) in sound were remarkable. The system is Quad based, and he keeps another Quad set-up in his London house. The source equipment – Sony, Quad tuner, Nakamichi cassette deck and Thorens record player – and the Quad amplifiers are housed in the bookshelves with the *405* power amplifier out of sight in a cupboard. Another cupboard opposite conceals a television and video recorder.

Mr Heath is a long standing customer of Quad and agrees that among politicians he's rare as an audiophile: "They don't go in for this sort of thing." At Christmas in 1974 the IRA managed to nearly ruin his other pair of Electrostatics when they threw a bomb through the first floor window of his London home. "They missed me by ten minutes," he remembers. Repaired, the speakers still give sterling service and our former premier says he couldn't do better than Quad equipment. "At times I venture out to systematically listen to all the other systems, and you don't have to listen very much – you can just wipe them away. I don't buy Quad because it's British, I buy it because I think it's the best." Unfortunately Quad's new CD player wasn't avail-



 	 The best pick-up arm in the world	 
 	AUDITION ANY OF THE HIGHLY ACCLAIMED BRITISH HIFI IN OUR DEMONSTRATION ROOM. KAMLA ELECTRONICS 251 Tottenham Court Road London W1 Tel: 01-323 2747	 
 		 
 		 
		TOWNSHEND AVALON



SELECTIVE AUDIO
proudly
presents on
permanent demonstration

ROKSAN XERXES · ARTEMIZ SHIRAZ

Amplification
by:-
JDI
BRYSTON
nva exposure
onix

at:-
The Forge Cottage
19 Crossgate
Otley LS21 1AA
West Yorkshire
Tel:-
0943 - 467689
Open:-
Mon-Sat 9a.m. - 6p.m.

Demonstration by Appointment



XERXES
ARTEMIZ
SHIRAZ



Sussex Audio

163/165 Church Road
Burgess Hill
Sussex
0444 242336

~~exposure~~ ONIX MANTRA
CELESTION Ruark TANTOY
marantz PHILIPS
AR DENON NAD

able when he bought the Sony.

He finds the sound of CD clearer than vinyl records to listen to and says it is therefore better for critical judgement of his recorded music collection. However, the collection of vinyl has been built up over the years from around the world and he laments that much of it will never be transferred into the digital domain. He also uses his middle-of-the-range Nakamichi cassette deck for tapes of his collection of 78rpm records. This is quite extensive: "My regiment was in Hanover – where Siemens had its excellent recording facility during the war, and we thought it was unjust on the Germans just to leave these things lying around so we made arrangements to bring them over."

A door from the library leads through to the music room where there is a pair of (overhauled) Quad Electrostatics dating from the '60s. These were custom made with chrome end caps as opposed to the standard wood. A switch on the room's skirting board allows these to be turned off while the system is being used in the library. The Electrostatics match a Steinway grand piano (which takes up about a sixth of the room space), although they were very nearly redecorated to match the warm pastel tones of the rest of the room. "Quad said it wouldn't be responsible for that and luckily the designer agreed," muttered Mr Heath. The music room enjoys a lot of



light, with pale floorboards and furnishings and windows on two sides facing east and south. Two armchairs and a sofa make for uncluttered floorspace broken up by the vivid colours and patterns of a few Persian silk carpets. "They're not sixteenth century," countered my host when I asked their age.

The sidetables and Steinway are bedecked with black and white photographs mapping Mr Heath's political and artistic career. Macmillan, Douglas Home and Eden jostle for space with Churchill while Indira Gandhi, Emperor Hirohito and Richard Nixon remind one of his years as British Premier. Across a photograph of Nixon at the helm of his own yacht is writ-

ten: 'In our line of work it always pays to have a second skill!'

The second skill is now music. And it is practised in this room, both through the hi-fi and piano. "If I am performing works then I would approach it from two aspects," he explained. "First I can listen (to a record) with the score – but if you know the score well enough then you don't have to have it in front of you – but you also need the overall impact of the work and not just the detail, and that you get without having your eyes on the score. If I am going to a concert, or an opera, or a ballet then quite often I take the opportunity the weekend before to play it over. Even more frequently, when I get back at night, I rush for the disc or the record and play bits which are particularly interesting to me to see why they did this, or why they messed that bit up, or whatever it may be. Because I find that my mind is still moving along those channels.

"And of course it's always interesting to compare different performances. There are two schools of thought about this. One is that if you are going to create a performance for yourself then you mustn't listen to other people's because that's going to affect your own decisions. The other view, of course, is that if you hear other performances it broadens your whole approach to the work, and it's up to you to decide, mentally and emotionally, what you want to do.



Spendor's musical bookends (above) doubtless produce some of the works categorised in the musical dictionaries they support.

THE SPECIALISTS

Rayleigh Hi-Fi

216 Moulsham Street. On-the-Parkway.

Chelmsford

Tel: 0245-265245
(3 LINES)

44a High Street.

Rayleigh

Tel: 0268-779762
747571

MY FRIEND SAID THAT YOU'D SORT ME OUT

(IN THE NICEST POSSIBLE WAY!!)

Most of our customers come to us on the recommendation of a friend. There are probably a number of reasons for this.

It may be because we stock the widest range of quality hi-fi in the area. It may be because we provide proper demonstration facilities. Unbiased professional advice by staff who are genuinely interested in music and hi-fi must be a large plus point especially as they are not motivated by how much commission they might be earning (because none of our staff receive any).

It could be the free delivery and proper in-home installation and the 3 year guarantee of systems (which means we have confidence in the products that we recommend).

However, we'd like to think that there's also an extra factor. We believe that every customer has individual musical needs and we take a pride in trying to provide the best possible solution to those needs. After all our reputation is important to us for if we take enough care, perhaps *you'll* soon be recommending us to *your* friends.



Roksan Turntable Xerxes£695.00
Artemiz Tonearm£495.00
Shiraz Cartridge£595.00

This superb combination now on demonstration



Roksan Darius Loudspeakers now on
demonstration £1265.00 per pair

HIGH QUALITY HI-FI FROM:

ACOUSTIC ENERGY ★ A&R ★ AUDIOLAB ★ AUDIO
TECHNICA ★ BEYER ★ BLQ ★ CAMBRIDGE AUDIO ★
CASTLE ★ CREEK ★ CYRUS ★ DENON ★ DUAL ★
EPOS ★ GALE ★ HEYBROOK ★ ION SYSTEMS ★
LINN PRODUCTS ★ MANTRA ★ MISSION ★
MONITOR AUDIO ★ MUSICAL FIDELITY ★ NAD ★
NAIM AUDIO ★ NAGAOKA ★ NAKAMICHI ★ ONKYO
★ ORIGIN LIVE ★ PROAC ★ QED ★ QUAD ★ QUART
★ REGA ★ REVOX ★ REVOLVER ★ ROKSAN ★
ROTEL ★ ROYD ★ STAX

NEW ARRIVALS

NEW REGA ELA LOUDSPEAKERS
£405

"Superb performance, must be heard"

0% FINANCE AVAILABLE FOR LIMITED PERIOD ONLY..
DETAILS ON REQUEST

3 YEARS PARTS AND LABOUR GUARANTEE ON HI-FI SYSTEMS



LICENCED CREDIT BROKERS - FULL FINANCE FACILITIES AVAILABLE - DETAILS ON REQUEST - APR 26.5%



THE SPECIALISTS



"Now, I will carry this philosophical strain a little further: I regret the fact that at our colleges and academies of music – and at universities – students are apparently not encouraged in any way to listen to other performances. For example, I find that if I say to some of these brilliant pianists 'Have you ever heard how Paderewski plays Chopin?' they say: 'No, why should we?' And I say 'Only because he's much closer to Chopin than you are'. And when I put on a Paderewski record they're absolutely astonished, and it's also true of many of the great conductors. I'm always astonished how few concerts by other people conductors go to.

"Once at Chequers – we used to have a lot of musicians to lunch or to dinner – one evening I said let's have an identification. I'll play some records of the same work played by different people and you can identify who they are. And they couldn't get one right! One of them didn't recognise his own recording.

"It's strange, or perhaps it isn't strange; for many years I went to a great number of concerts on the basis that it would be interesting and that I would learn something however good or bad it was. That is no longer a satisfactory philosophy and I don't want to go to a performance which might blur the memories I've got of the really top performances. Which means one has to be rather choosy on the basis of what one knows about the performer. Or you

Chrome-customised Quads enjoy pride of place in the music room – the IRA bombed a sister pair in 1974.

rely on reviews – which aren't always reliable."

Mr Heath is conservative about the approach to music and argues that if you have a good performance there is no need to put 'some extra psychological explanation into it, or do it in jeans and T-shirts'. He praises the Russians' approach to performances where exactly the same production will be repeated but for new (but not different) costumes, performers and stage scenery – and will only be staged for three nights even if they are very successful.

For him the 'live' work, or concert, of music is all important but he says it is inevitable that modern studio recordings consist of chopped blocks of music rather than one continuous piece which may contain several mistakes. "It is extremely difficult – you listen to the master tape and then come back and say: 'Right, in bar 79 in the first movement an oboe wasn't tuned so we'll start at bar 76 and stop at 83'. But you have to get into the same tempo that you were in before just for those five bars. But that is still better than leaving the oboe out of tune."

I wonder. While playing some of his favourite music he compared a new recording of Bruckner's Fourth conducted by Riccardo Muti, with an older live record-

ing of the same symphony by Wilhelm Furtwangler and the Vienna Symphony Orchestra – originally taped in 1951 – remastered by Deutsche Grammophon. Both were on CD. "This doesn't make me want to do anything, it just goes along," said Mr Heath of the former offering, patting the air with the image of a pathetic pace. Putting on the second live recording he began conducting on the sofa. "You can feel the tension growing, it makes you want to leap up! By comparison the other piece is just ordinary."

While that is hopefully true, and champions the cause for less editing and re-editing in classical music, it is also true that the hi-fi system has to be suitably capable to let us hear such apparent differences in the music. The Sony and Quads here acquitted themselves admirably.

THE SYSTEM

Thorens 321 turntable	n/a
Linn LVX arm	n/a
Quad FM4 tuner	£309
Nakamichi BX150E cassette deck	n/a
Sony 308ESD CD player	not UK
Quad 34 preamplifier	£285
Quad 405 power amp	£349
Spendor LS3/5a speakers	£297
Quad Electrostatics	£1,538

System supplied by: Angus Gibson Music, 117 Stephendale Road, London SW6. Tel: (01) 384 2270.



"Now, I will carry this philosophical strain a little further: I regret the fact that at our colleges and academies of music – and at universities – students are apparently not encouraged in any way to listen to other performances. For example, I find that if I say to some of these brilliant pianists 'Have you ever heard how Paderewski plays Chopin?' they say: 'No, why should we?' And I say 'Only because he's much closer to Chopin than you are'. And when I put on a Paderewski record they're absolutely astonished, and it's also true of many of the great conductors. I'm always astonished how few concerts by other people conductors go to.

"Once at Chequers – we used to have a lot of musicians to lunch or to dinner – one evening I said let's have an identification. I'll play some records of the same work played by different people and you can identify who they are. And they couldn't get one right! One of them didn't recognise his own recording.

"It's strange, or perhaps it isn't strange; for many years I went to a great number of concerts on the basis that it would be interesting and that I would learn something however good or bad it was. That is no longer a satisfactory philosophy and I don't want to go to a performance which might blur the memories I've got of the really top performances. Which means one has to be rather choosy on the basis of what one knows about the performer. Or you

Chrome-customised Quads enjoy pride of place in the music room – the IRA bombed a sister pair in 1974.

rely on reviews – which aren't always reliable."

Mr Heath is conservative about the approach to music and argues that if you have a good performance there is no need to put 'some extra psychological explanation into it, or do it in jeans and T-shirts'. He praises the Russians' approach to performances where exactly the same production will be repeated but for new (but not different) costumes, performers and stage scenery – and will only be staged for three nights even if they are very successful.

For him the 'live' work, or concert, of music is all important but he says it is inevitable that modern studio recordings consist of chopped blocks of music rather than one continuous piece which may contain several mistakes. "It is extremely difficult – you listen to the master tape and then come back and say: 'Right, in bar 79 in the first movement an oboe wasn't tuned so we'll start at bar 76 and stop at 83'. But you have to get into the same tempo that you were in before just for those five bars. But that is still better than leaving the oboe out of tune."

I wonder. While playing some of his favourite music he compared a new recording of Bruckner's Fourth conducted by Riccardo Muti, with an older live record-

ing of the same symphony by Wilhelm Furtwängler and the Vienna Symphony Orchestra – originally taped in 1951 – remastered by Deutsche Grammophon. Both were on CD. "This doesn't make me want to do anything, it just goes along," said Mr Heath of the former offering, patting the air with the image of a pathetic pace. Putting on the second live recording he began conducting on the sofa. "You can feel the tension growing, it makes you want to leap up! By comparison the other piece is just ordinary."

While that is hopefully true, and champions the cause for less editing and re-editing in classical music, it is also true that the hi-fi system has to be suitably capable to let us hear such apparent differences in the music. The Sony and Quads here acquitted themselves admirably.

THE SYSTEM

Thorens 321 turntable	n/a
Linn LVX arm	n/a
Quad FM4 tuner	£309
Nakamichi BX150E cassette deck	n/a
Sony 308ESD CD player	not UK
Quad 34 preamplifier	£285
Quad 405 power amp	£349
Spendor LS3/5a speakers	£297
Quad Electrostatics	£1,538

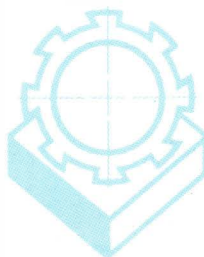
System supplied by: Angus Gibson Music, 117 Stephendale Road, London SW6. Tel: (01) 384 2270.

ALTERNATIVE AUDIO

PRESENT THE ROKSAN SERIES OF PRODUCTS



XERXES ARTEMIZ SHIRAZ HOTCAKES



On Permanent Demonstration

- ★ 3 DEMONSTRATION STUDIOS
- ★ 2 YEAR GUARANTEE
- ★ FREE DELIVERY AND INSTALLATION
- ★ FINANCE AVAILABLE, INCLUDING INTEREST FREE ON SELECTED PRODUCTS

Other Agencies: Acoustic Research, Aiwa, Allison, Arcam, AKG, Audio Technica, Ariston, Audiolab, Alphason, Beyer, Cambridge, Castle, Celestion, Denon, Dual, Exposure, Goldring, Heliuss, KEF, Kenwood, Linx, Mantra, Mission, Musical Fidelity, Marantz, Monitor Audio, Mordaunt-Short, Meridian, Maxell, NAD, Nagaoka, Nakamichi, Ortofon, Philips, Monster, Jecklin, QED, Quad, Revolver, Roksan, Rotel, Ruark, Sony, Technics, Sennheiser, Target, TDK, Thats, Thorens, Tannoy, Onkyo, van den Hul, Wharfedale, Yamaha, etc.

ALTERNATIVE AUDIO LTD.



93-95 Hobs Moat Road,
Solihull,
West Midlands B92 8JL.
SALES: 021 742 0254
SERVICE: 021 742 0248

Demonstrations by Appointment.
Open 10-5.30 Tues, Wed, Thurs & Sat. Late Night Fri 10-7.
Licensed Credit Broker, Written Details on Request



STATEMENTS

Monitoring what's happening on the high-end scene . . . This month, Alvin Gold auditions two of America's finest outboard D-to-A converters.

I'm not sure I can say this with a straight face, but here goes anyway . . . The Wadia Digital 1000 is one of two budget price Wadia digital converters, admittedly the more expensive of the two at £4,930 with proprietary 'Digimaster' software from the top-of-the-line model – the two-box £7,300 Wadia 2000. A version of the 1000 with different ('Frenchcurve') software and processing costs £4,185, and is known as the *Digimaster 1000*. Got all that?

Like all Wadia converters, the processing algorithms can be upgraded at will by changing instruction sets which are stored on EPROMS.

The Theta *DS Pro*, which like the Wadia comes from the US, is pitched at a usefully lower price than the Wadia, at £3,600, but can otherwise be regarded as directly comparable. Quite how I managed to bag both machines at the same time I'm not sure. It seems to have been blind chance or fortuitous accident – or both.

In broad outline both converters do the same job. They're large and imposing single box devices which accept a variety of digital sources at the standard 32kHz, 44.1kHz and 48kHz sampling frequencies, and which feed the outside world through fixed level phono outputs – balanced or unbalanced in the case of the Theta. Front panel switching is confined to status matters and digital domain absolute phase changeover, accomplished in the Theta with a fair, very high frequency 'crack' that suggests that reducing the volume before switching wouldn't be a bad idea.

There isn't much room to discuss technology, but to give a taster, the Theta uses eight-times oversampling and 16-bit conversion (I think – the documentation was a bit obscure on this point), whilst the Wadia uses 18-bit conversion and 64-times oversampling. But these are not the crucial features of either unit. In both cases, much of the money has gone into the complex, processor-hungry digital filters which optimise in the time/phase domain rather than the amplitude domain. Both units use very little post DAC filtering, and indeed might get inadequate preamplifiers into trouble due to excessive RF. They are also sensitive to loading, especially the Theta, for which a special custom cable (which gave very good results) is available



at extra cost. Both units are built on the grand scale, but are no feasts for the eyes, despite the Wadia's expensively fabricated case.

However, I was less impressed by the nature of these two products as individuals than I was by the larger point to be extracted after listening to both. Contrary to my personal expectations and notwithstanding all the hype (I have reams of it, especially for the Wadia), these two processors really do open up new doors and set new standards, finally closing the 'musicality' gap with top end analogue audio. This is not a claim I have ever made before, and it's not one I make lightly now.

A parallel, secondary finding is that most of the compact discs available in the shops are a good deal better than they are generally given credit for.

Looked at from one point of view, these two processors show beyond question that ordinary converter designs, even good quality ones, leave a great deal to be desired. It was a sobering experience to discover how badly the existing converter technology is shown up by these two (on this occasion exemplified by the one built into the Marantz *CD-94II*, which by common consent is one of the better integrated units), and I include in the blanket phrase 'existing' most, if not all, of the outboard converters that have been available so far. Bitstream – at least any Bitstream converter I've encountered to date – simply isn't in the running.

DS Pro, from the Theta Digital Corporation of California. UK distributor is Absolute Sounds.

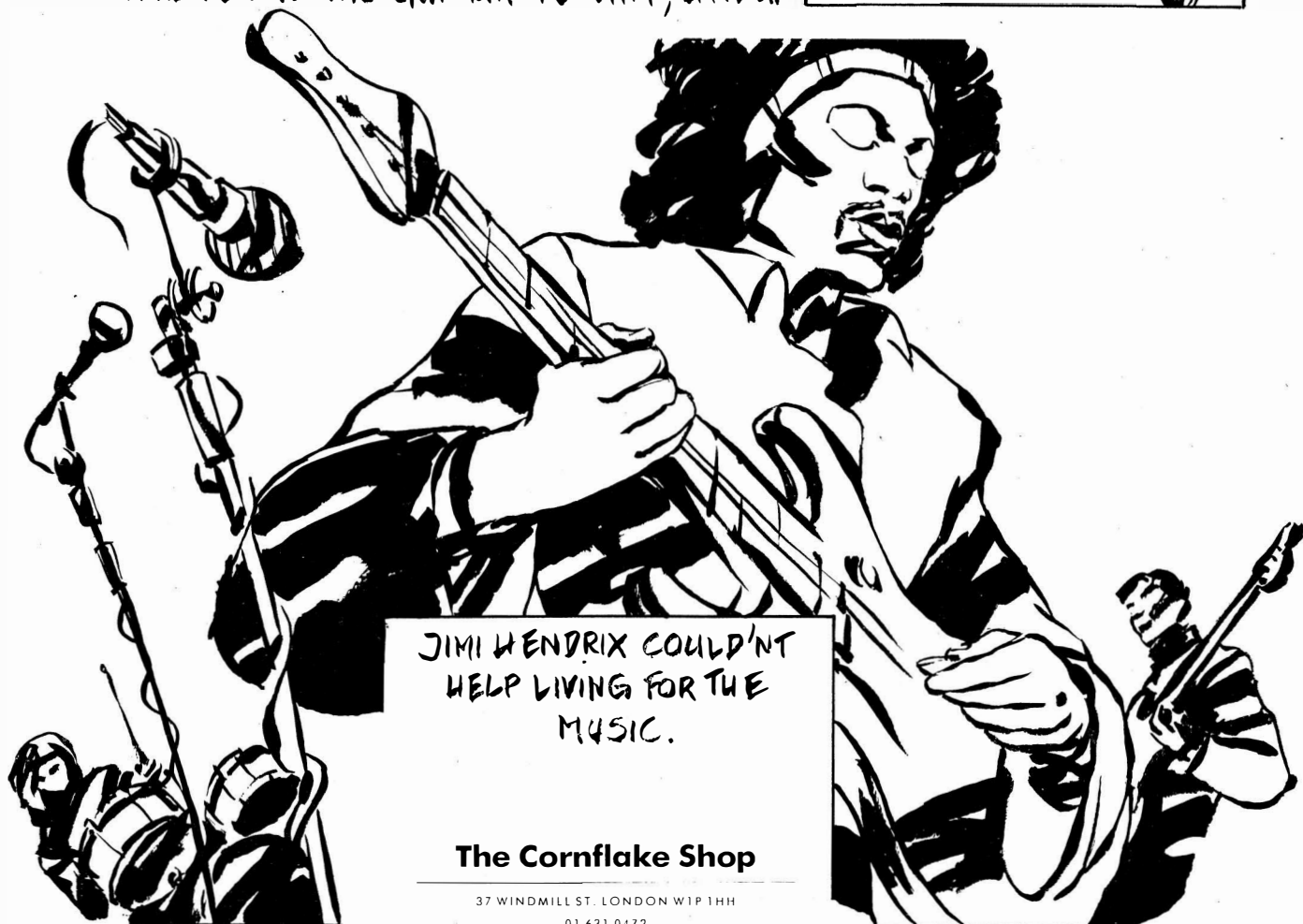


JIMI HENDRIX
JOINED THE
ARMY TO
GET AWAY
FROM HIS
MUSIC.



BUT AFTER A WHILE HE MADE
HIS FATHER SEND HIS GUITAR TO HIM, AND...

...FROM THEN ON HE EVEN
TOOK IT TO BED AT NIGHT.



JIMI HENDRIX COULDN'T
HELP LIVING FOR THE
MUSIC.

The Cornflake Shop

37 WINDMILL ST. LONDON W1P 1HH
01 631 0472

LONDON'S NUMBER ONE ROKSAN DEALER

I also found that the improvements wrought by these two designs had little to do with the kind of subtleties which are all you might expect to separate one 'perfect' item from the next. It was Philips, remember, who initiated the CD era by declaring its brainchild 'perfect', from which you might reasonably have inferred that improvements in sound quality were unlikely. How wrong this turned out to be!

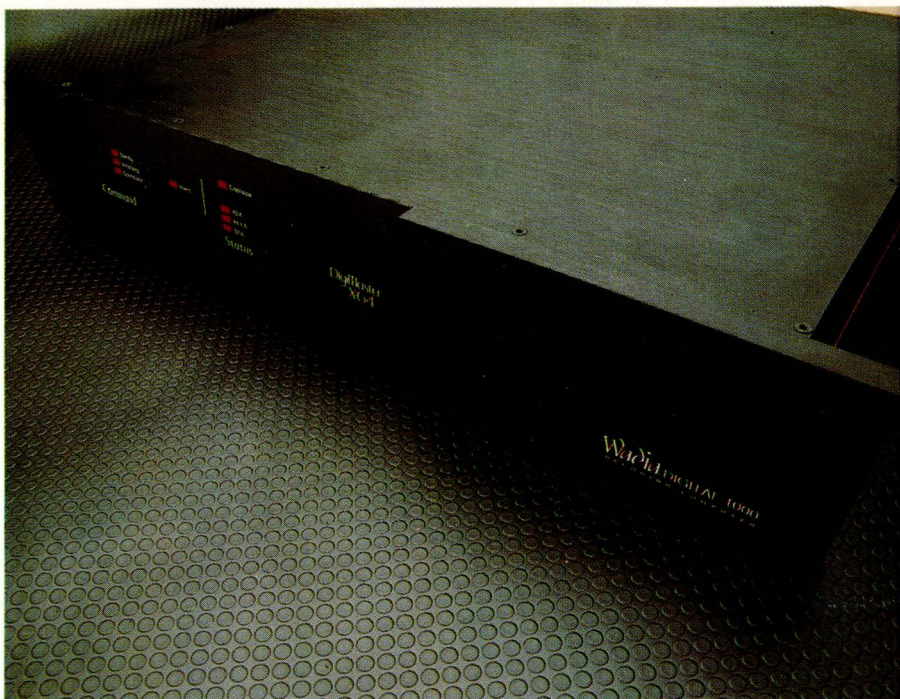
Although alternative descriptions are possible, I believe the musical strengths of both converters spring from what I can only describe as a dramatic increase in perceived bandwidth, from which flows a tremendous increase in dynamics and resolution. The bandwidth claim may seem paradoxical in view of the fact that CD is a narrow band system already exploited to its full by just about every piece of digital gear extant. But what I heard gives the lie to this.

It is low end bandwidth that seems to benefit most. Using a loudspeaker with acknowledged low frequency range and power, the Tannoy *DC-3000*, demonstrated that compared to either of the outboard converters the Marantz sounded dry and severely constrained in both extension and power. As a result (I believe) the player as a whole is not capable of developing anything like the dynamic range available on the recordings. Both outboard converters sounded larger, bolder, more richly coloured and variegated than the unaided Marantz, yet individual instruments and voices were more sharply positioned in space. For once, loud events were genuinely loud and not compressed.

I was particularly impressed by this finding because it has been my contention from day one (implicitly or explicitly denied by many other observers) that the real problems with CD were lack of dynamics and detail. The more usual claim is that CD is unpleasant, nasty, edgy and uncomfortable. In some quarters the word digital is practically a euphemism for uncouth sound. With certain obvious exceptions, I've always thought such conceptions misplaced.

Whether you agree with this or not, neither of these processors make digital sound any less digital in that derogatory sense. Rather the opposite in fact, and if you object to an overtly digital style of presentation you could find these two units do little to address your complaints. But you will be guilty of putting the cart before the horse, and of looking for the wrong solutions to a problem that is rarely if ever in the sole domain of the CD player. Similarly, if you think that one of the major problems is the quality of the discs you buy, this is another idea these converters will disabuse you of, as their strengths are apparent with almost any disc you care to name, even ones you might have considered duff.

So far I've discussed these two players in parallel, as though there was no real dis-



inction to be drawn between them. To the extent that they are both in order of magnitude superior to previous generation converters this is all well and good, but although they sound much more alike than they do different, the differences are there and they're important.

On the evidence available to me now, the Wadia has the edge because it sounds better organised. The Theta reproduces a tremendous amount of information off disc, but in certain ways it presents it somewhat scrappily with the result that it can be rather hard to follow. The Wadia is much easier to listen to at length, and at least as informative. More so in fact, its footwork in the bass especially being extraordinarily vivid and tuneful.

Startling evidence for this can be found in the most unexpected places. Try, for example, the track *Misguided Angel* from Cowboy Junkies' *Trinity Sessions* CD and listen to the ultra-low frequency sounds from the stage responding to foot taps and the other subtle environmental noises. The effect of the Wadia in particular is to bring this already very fine recording of a simply-mixed, mostly acoustic band to startlingly vivid life. In the Theta's favour, it does much of what the Wadia does at over £1,300 less outlay.

There's another intriguing twist to the story, and it also concerns price. I don't have the appropriate figures for the Theta which from the brief technical description available to me is probably slightly less impressive, but the Wadia's digital filter algorithm involves number crunching at the astonishing rate of 72 MIPS (millions of instructions per second). The (reasonably powerful) micro I'm using to write these words operates at around 3 MIPS, and even a typical VAX minicomputer only runs at about 10M MIPS. In fact 72 MIPS is the kind of figure associated with large IBM mainframes, and the Wadia probably

Wadia Digital 1000: 'Digimaster' and 'Frenchcurve' software available at different prices. UK distributor is Acoustic Energy.

RICHER Sounds

THE SALE!

FREEPHONE 0800 591 366
FOR YOUR FREE COPY OF OUR FUN BARGAIN-PACKED CATALOGUE PRICE LIST.

THE UK'S CHEAPEST & BUSIEST HI-FI STORES!

CONTINUES...

0% INTEREST FREE CREDIT
 ON ALL SYSTEMS no forms, only subject to simple clearance.

MARCH NEWS

THE SHOW MUST GO ON...
 If you thought you'd missed our Crazy Sale, think again! We don't let anyone off that easily! The fabulous, legendary, scruffy, inexcusable, appallingly cheap Richer Sounds Hi-Fi Sale continues on selected items for another few weeks so there's still time to don your armour and dive headfirst and willy-nilly into the wild, wacky, wicked maelstrom of our tiny and disgraceful stores. There are bargains galore... Bring galoshes, sandwiches and a wheelbarrow.

WE ARE THE SYSTEM SPECIALISTS

We pride ourselves in being able to put together a proper hi-fi separates system from around a £100. Although admittedly quite basic, thousands of our customers have started on the hi-fi road with a system similar to this comprising a turntable, cartridge, stereo amp and a pair of speakers. For customers with a little more to spend we offer a second to none selection of hi-fi separates, specialist friendly service, and of course our world renowned value for money! We will happily arrange Interest Free Credit subject to status, give you generous packages of free accessories depending on the size of your purchase, and a price beat promise that's unbeatable (and is valid even after you've purchased your equipment!) We welcome part exchange and can despatch (via Securicor) to anywhere in the country. If you live near to our shops we can deliver by hand and advise/help with installation and setting up. We genuinely believe we offer the best all round system deal, why not give us a try?

Our hefty buying power and unbeatable price beat promise guarantee you the most competitive prices on these top brands:

- | | | |
|----------|-----------|------------------|
| AKAI | MARANTZ | SHARP |
| AIWA | MONITOR | SENNHEISER |
| AR | AUDIO | SONY |
| ARISTON | NAD | TANNOY |
| BOSE | ONKYO | TDK |
| B&W | PANASONIC | TEAC |
| DUAL | PIONEER | TECHNICS |
| FISHER | PHILIPS | THATS |
| GOLDSTAR | QED | TOSHIBA |
| GOODMANS | ROTEL | VIDEOTONE |
| HITACHI | SANSUI | WHARFDALE |
| JVC | SANYO | YAMAHA |
| KENWOOD | SCANDYNA | AND MANY MORE... |

SMASHING 50 WATT YAMAHA AMP!



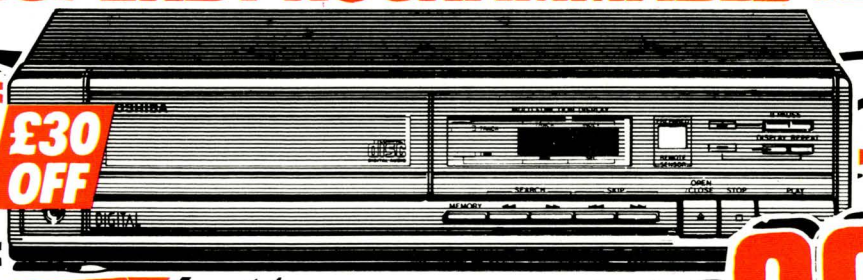
£30 OFF

YAMAHA A09 No, it isn't a misprint - £79 really IS our exclusive offer price on this impressively specified amp from Yamaha. Enjoy the flexibility of a 5-band equaliser, the punch of a full 50 watts (RMS/ch) power output, the convenience of numerous phone inputs and the stunning style that's made Yamaha's top name a world leader.

RICHER'S CRAZY PRICE
£79
 WAS £109.95

WE'LL BEAT THAT PRICE 'TIL IT HURTS!
 We want your business even if it means losing money! If you've seen our hi-fi cheaper we'll beat that price by £10 with a smile! Some suppliers don't like us advertising discount prices so do shop around to help us give you the best deal. *Must be in stock within 75 miles of your nearest store. Price beat valid up to 7 days after purchase.

£££ OFF THIS! SUPERB PROGRAMMABLE CD



£30 OFF

TOSHIBA XR9318 Treat yourself to this... £99 isn't a misprint, but our exclusive knock 'em dead price on this award winning Philips-made CD player. Add it to your system today and enjoy terrific digital sound, true sophistication, a "musical and dynamic" (say Hi-Fi Choice Magazine) machine. Yours for less than £100! WAS £129.95

RICHER'S CRAZY PRICE
£99
 Bring this ad. for special price.

Birmingham 10 Smallbrook Queensway, B5 4EN. Tel: 021 643 1516 (In front of Albany Hotel)

Bristol 20 Cotham Hill, BS6 6LF. Tel: 0272 734397 (50 yds Clifton Down Shopping Centre. Opposite 'Crookers Pub')

Cardiff 5 Central Square. Tel: 0222 383311. (By the Bus Station)

Edinburgh 1B Chambers Street, EH1 1HR Tel: 031 226 3544 (Near the Royal Scottish Museum)

Leeds 55 The Headrow, LS1 6LR. Tel: 0532 455717 (Opposite 'Lewis' Department Store)

Liverpool 99 Renshaw Street, L1 2ST Tel: 051 708 7484 (Opposite 'Rapid Hardware' store. On corner, top of Bold Street).

London Central 2 London Bridge Walk, SE1 2SX. Tel: 01 403 1201 (10 lines) 01 403 4710 (above Duke St. Hill)

London North 25 Northways Parade, College Crescent, NW3 (Bottom of Fitzjohns Ave) Tel: 01 722 3359

Stockport 4 Wellington Street, SK1 3RN. Tel: 061 480 1700 (100 yds Stockport Station. 10 yds off the A6)

York 66 Walmgate, YO1 2TL. Tel: 0904 645535. (3 doors from the 'Yorkshire Evening Press' office)

We are open: 10-6pm Monday-Friday, 10-5pm Saturdays (except Birmingham, Leeds, Liverpool & York 9-5pm Sats) London central also open late 'till 7pm Thursday & Friday.

We welcome: Access, Visa, Cheques (up to £1000 subject to status) and Part Exchange. All goods brand new in sealed boxes unless otherwise stated. inc. VAT and g'teed 1 year. E&OE. All stores have a clearance corner full of ex-display and secondhand bargains and browsers are definitely welcome!

WE LOOK FORWARD TO SEEING YOU SOON



offers more processing power per pound invested than any product that involves data processing I can think of. I know this isn't a strictly audio related argument, but it is at least relevant to the value for money question. Having said this, I can't wait for machines of this calibre to become more affordable so that I can buy one for myself.

HIGH-END UPDATE

For audiophiles who can but dream of owning a *Premier Seven* preamplifier, Conrad-Johnson has now produced a cut down, slightly more affordable version of its flagship model. Called the *EV-20*, it is of course an all-tube design – “incorporating much of the technology and components” of the *Seven* but built into a single chassis. State-side price is \$5,000. Alongside this, C-J has also launched the *EV-2000* 200watt power amplifier, a hybrid employing valves in the driver stage and a MOSFET output stage.

And, for the first time, Conrad-Johnson is now marketing solid state amplifiers under the C-J brand name. (Previously all C-J's transistor designs have sported the Motif badge.) Conceived primarily to complement the company's *DF-1* CD player, the 80watt *MF-80* (launched last summer at the Chicago CES) has now been joined by a 200watt *MF-200* model, premiered at Las Vegas with a \$2,000 price ticket, and a \$1,300 preamp called *PF-1* which is based on “a unique J-FET design”.

UK distribution for Conrad-Johnson is by Audiofreaks. Tel: (01) 948 4153.

Path Group plc, which in recent times has become increasingly active in the high-end marketplace with Stax, Aragon and Madrigal products, has formed a new marketing division to deal with its specialist hi-fi components called Path Premier. And there are new products a-foot. US company Madrigal, which designs and manufactures Mark Levinson gear Stateside, has launched a new brand line called *Proceed* which is designed to be a kind of ‘almost

affordable Levinson' brand. First *Proceed* product in the UK will be a stylish CD player priced £1,850. Watch this space.

Meanwhile Aragon, which has enjoyed much success with its power amps designed by Dan D'Agostino (of Krell fame), is now producing a high-end out-board D-to-A converter priced £1,395. Designed by Mike Moffat of Theta Digital Corporation, the cutely-named Aragon *D2A* is a two-box unit (power supply components and digital circuitry are housed separately) featuring a direct tape output for DAT/CDR, hand-held controller for absolute phase reversal and three inputs (one is optical). Most importantly, say the folks at Path, the design is based around removable modular boards making the *D2A* fully upgradable.

And the gargantuan Stax *DAC-X1t* digital to analogue converter is now in the UK. This 20-bit eight-times oversampling unit, which looks more like an American muscle amp than a DAC, employs Sunnyvale California chips costing an unbelievable \$800-\$900 each! Featuring a valve output stage and *three* mains leads (yes, really – there are separate power supplies for the left channel DAC, the right channel DAC, and the analogue stages), the price to you, governor, is £8,000.

Path Premier, tel: (0494) 441736.

The fabulous Primare *Series 928* amplifiers from Denmark, previously distributed in the UK by Acoustic Gold, are now being handled by Quantum Audio. Quantum also distributes QLN loudspeakers along with Furukawa and YFERE cables.

Primare's *928* monoblok power amps cost £2,200 each; the matching remote control preamplifier costs £4,250. A non-remote version of the *928* preamp is available at a cost saving of £1,000.

Quantum Audio Ltd, PO Box 26, Kilmarnock, Ayrshire KA3 7BN. Tel: (0563) 71122.



Top: D-to-A called D2A (!), designed for Aragon by Theta's Mike Moffat. Below: Primare's gorgeous Series 928 amplifiers.



PERSPECTIVES

Jason Kennedy looks at and listens to some inexpensive ways to improve your system.



The revamped Systemdek complete with acrylic platter and metal armboard.

Telltale Tweaks

A year-and-a-half ago we published a feature on 'tweaking', or getting the best out of your system without spending vast sums on new components. At the time I had only recently joined *Choice* and thus had plenty of ideas thought up in the days of having time but limited funds to spend on upgrades. Since then the plethora of equipment available to experiment with has meant that the search for 'something for next to nothing' tweaks has diminished considerably. Consequently what follows this month is an assessment of a variety of manufactured low-cost bits and bobs that can be used to improve the performance of your system.

Tweaking should be fun and experimentation is as important as anything else. Different combinations of equipment will react in different ways to the devices that you apply to them; for instance one wouldn't expect a loudspeaker to work

equally well with a solid and a frame stand. After playing around with different ways of using things like cones, armboards or whatever, the cause and effect process becomes more obvious and you can apply appropriate techniques to achieve the best sound that your system can offer.

TURNTABLES AND THE ACRYLIC FACTOR

In the last tweaking article a rather unusual platter re-design on a Townshend *Rock*, involving supporting the record on only the label area, was investigated and found to offer improvements in some areas over the conventional heavyweight platter. However, its executor (my father), not being the sort to let sleeping dogs spin at 33 $\frac{1}{3}$ rpm, decided to attack the situation from another angle and turned up an acrylic platter some two inches deep. This seemed to bring about significant improve-

ments in nearly every respect and for a while a friend (Robert Dowse) produced and sold these, if only on a fairly local scale. Robert, the man behind the Audio Innovations *Inertia* tonearm, was at the time running a small shop selling, amongst other things, Systemdek turntables. Being a fan of the Voyd turntables and the aforementioned *Rock* tweak, he decided to apply the same approach to the relatively modest Systemdek.

So enthused was he about the improvements wrought by replacing the existing glass platter and felt mat with a 17mm thick acrylic platter, that he decided to go one further and replace the Medite armboard with an aluminium one. This, for those unfamiliar with the two Voyd decks, pretty well makes the Systemdek into a 'mini Voyd', albeit with a single low torque motor and basic suspension. These two components are now available as a kit from Audio by Design which sells it for £80 via mail order as well as through several dealers so that you can listen to the improvements prior to purchase.

Installing the platter and armboard is pretty straightforward, but the extra thickness of the acrylic combined with the reduced depth of the armboard means that if your arm cannot be adjusted for height (eg Rega) then a spacer or some washers placed between armboard and subchassis will be needed to bring the arm up to a position where correct VTA can be achieved. It's as well to secure the subchassis with the transit screw whilst adjusting the armboard. The subchassis will probably require some adjustment after the new parts have been fitted, but as the adjusters are accessible from above this isn't difficult as long as you have the right size Allen key.

The Systemdek with which this kit was tried is a *IIXE*, fitted with an *SME IV* arm and Goldring *Excel* cartridge, which whilst not a normal combination works quite well on the deck in its standard form. Out of interest the armboard and platter were auditioned separately to assess which part had the greatest influence, but as it turned out neither component on its own made anything like the improvements wrought by the combination. In both cases the per-

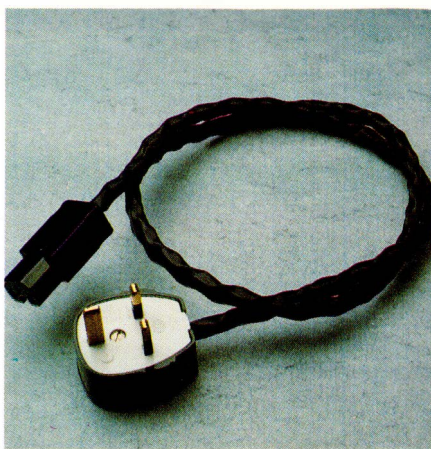
formance of the deck came up a few notches, the platter resolving dynamic information well and the armboard bringing definition up to a competitive level. However, this is assuredly a case of the whole being greater than the sum . . .

Fitting the new armboard and platter and setting arm height so that VTA is spot on transforms the *IXE* from a much-better-than-average mid price deck into a beast that's capable of showing a lot of expensive turntables a clean pair of heels. It's very revealing in as much as it extracts information in a coherent and controlled fashion, dynamic range is up in the very good category, and definition is unusually precise. With this particular arm and cartridge the midrange is the player's strongest asset, bass being a shade lightweight and poorly defined at very low frequencies whilst the very high treble is a little hard. I suspect that this latter quality is a factor of the cartridge which requires some damping, such as that provided by the standard Medite armboard, in order not to sound a little shrill. Given the more likely arm and cartridge combinations that are used on the Systemdek this latter factor isn't likely to be a problem, but if your deck already sounds a bit 'hard' this aspect may be emphasised.

The overall effect of the upgrade is astonishing. It makes the basic model, which previously seemed quite musical and friendly, sound woolly and vague. Don't worry, the musical quality is still there but it's joined by far improved resolution and dynamics. So, if you own a Systemdek and are thinking of upgrading it to something more expensive, think again.

THE SUPPORT FACTOR

The importance of well designed stands and supports for audio equipment has long been acknowledged. But the fact that different components benefit from different types of support has been less widely discussed. Virtually all audio components, be they amplifiers, CD players or turntables, seem to do a better job when they are iso-



A manly bit of Kimber mains cable, and below, an angular approach to equipment support.

lated from external vibration of both the structural and airborne variety.

Of course, absolute isolation is extremely difficult and rarely practical, but in any system it's worth using some form of proprietary table or shelf. With a few exceptions these are made out of welded steel tubing connected with spikes to Medite platforms, so the appearance of an unusual variation on this theme from Pinner-based Mana Acoustics was of some interest. The company produces both tables and shelves constructed out of welded angle iron (ie steel that is 'L' shaped in section) with glass platforms, which at first seems a very odd choice but the two different materials were arrived at through trial and error using the manufacturer's Linn/Naim system. Because you can't just push the platform on to the spikes (either three or four can be used) the table has to be set up with a little more care than usual. If four spikes are used to support the glass top, recommended for components that have four feet, each spike has to be carefully adjusted so that the glass doesn't rattle when tapped, ensuring even support at each point.

The sonic effect of using this £175 table instead of a simple but well made Cornflake Shop device (around £50) with the aforementioned Systemdek was quite



Peter Belt begone! Elfix electrical radiation detector from RATA.

uncanny. The most striking difference is that the bandwidth increases to encapsulate a further octave in both bass and treble, bringing with it the impression of greater volume. Further listening, and a gradual back tracking through favourite LPs, revealed a considerable improvement in information retrieval and coherence of presentation, ie records sounded less muddled and the turntable became more confident in its replay of complex material. All in all this particular turntable moved up a notch in the sound quality ratings, an improvement that would be difficult if not impossible to match with, say, an arm or cartridge of the same price. It still seems like a lot to pay for a table, but suspended subchassis turntable owners won't be disappointed.

MEATY MAINS CABLES

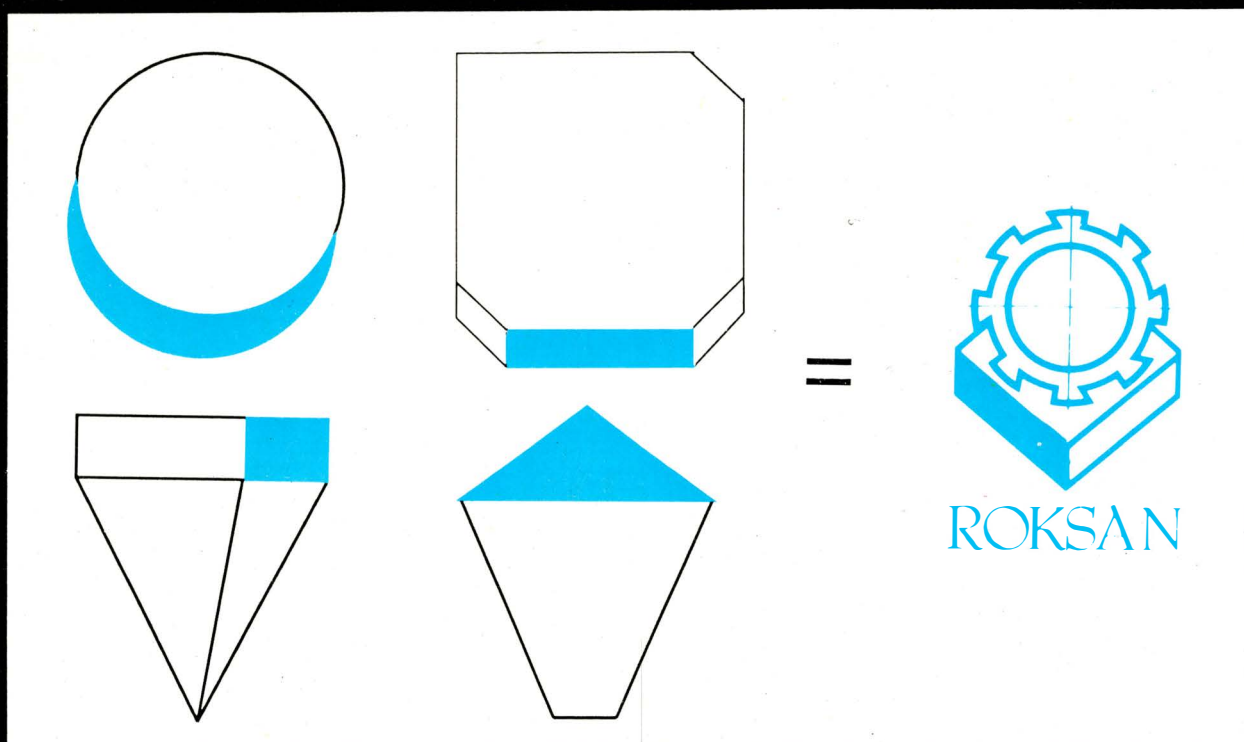
In the last tweaking feature we examined the positive effects of replacing a component's mains flex with twin-and-earth solid core mains cable, not the most flexible or attractive stuff but remarkably good value in sound for pound terms. Since then a variety of specifically 'hi-fi' alternatives have appeared on the market, amongst them the Kimber *4TC* leads being distributed by Russ Andrews. These are made up much like the speaker cables by the same company, four multistrand insulated conductors being used for live and neutral and a standard gauge lead for earthing requirements. All three conductors are woven together and sheathed in heat-shrink making for a professional-looking, if somewhat inflexible cable. A chunky MK plug is supplied as well as either an IEC or Telefunken plug (as found on many CD players, typewriters, etc) at the other end. It's probably safe to assume that an unterminated version for hardwired components is also available. Available in half metre or more lengths, price is £32 per metre including appropriate plugs.

The sonic effect of replacing the existing, and reasonably chunky, mains lead on an Audio Innovations *Series 1000* preamp was an immediate improvement in the resolution of low level detail. The sound became cleaner and things like



State of the Art

Music at Heart



the Audio shop

hi-fi specialists

agents for:
arcam, audio research, cambridge audio,
celestion, counterpoint, jpw, linx, marantz,
magneplan, michell, martin logan, qed,
quad, revolver, revox, spendor, sme and others.

128, Poole Road Westbourne Bournemouth BH4 9EF. Telephone 0202 762 160

room acoustics and 'decay' less blurred. The most apt audio adjective would seem to be 'focus' which became finer as a result of using this cable. Replacing a slimmer mains lead on the Innovations *First Audio* power amp further improved the fidelity of the system but in a different way, this time the volume level actually appearing to increase and the sound taking on a more purposeful and definite quality. A slight tinge of aggression accompanied this, which may have been down to the increased resolution, and possibly comes from the cartridge used in the system.

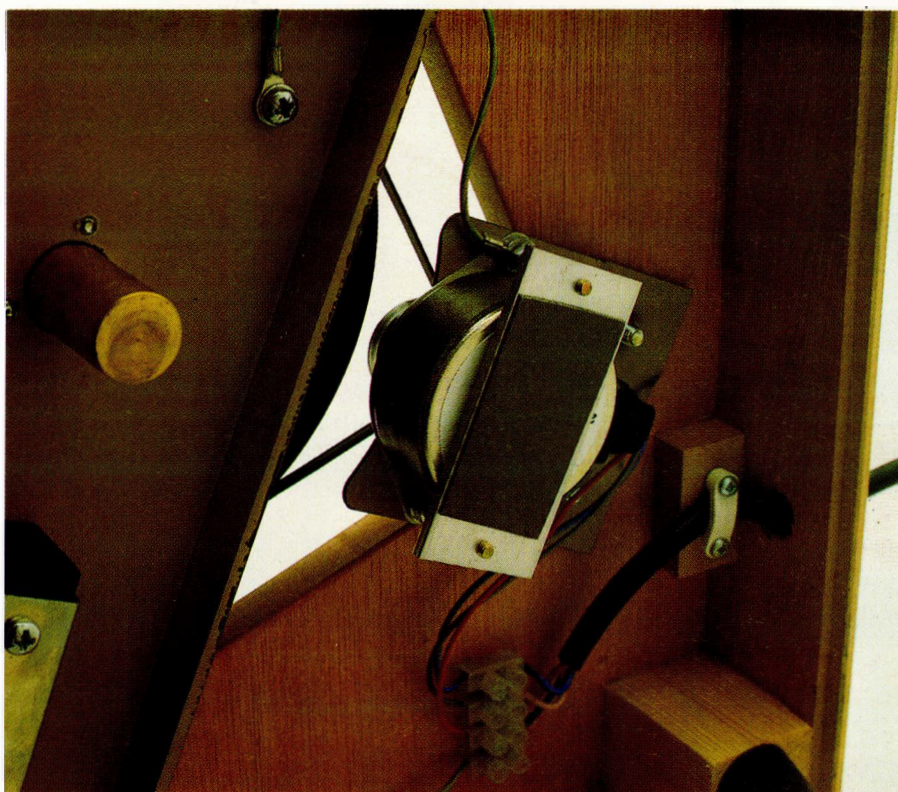
The next component to receive the Kimber cable treatment was a Marantz *6511SE* CD player which has a conventional two pin AC socket. Having established the correct polarity with both the standard and Kimber leads (of which more later) the task of comparing the two was undertaken. The result, once again, was in favour of the Kimber which gave the sound a more subtle and refined feel with simple music and added dynamic impact to complex material. Definition was improved and low level information became clearer.

With a system that is reasonably transparent and a source that you want to hear more of, these Kimber mains leads offer a definite sonic improvement, but whether it's £30 better than that available from solid core is another matter. With valve amps, which from my experience seem not to be that fussy about mains quality, the benefits are tangible but marginal. However, I suspect that solid state components, especially chunky power amps, would really appreciate a length of *4TC* between them and the mains supply.

AC-CA!

Getting the polarity of the mains correct with audio components makes a difference to the way they sound. If you don't believe it, try turning over the two pin mains plug on a CD player. Components with this type of mains connection are easy to experiment with, but in some cases the effect will be so subtle that budget systems might not reveal them immediately – although in the long term they become clear. With components that have fixed leads it's more of a hassle to A/B the effects of switching live for neutral in the mains plug, however there is now a device that detects electrical radiation and can be used to check mains polarity. It's called the Elfix and hails from Sweden.

Like the Kimber cables, the Elfix is distributed by Russ Andrews Turntable Accessories and is very straightforward to use. Just point it at the component and adjust sensitivity until the light flashes lightly, then without altering its position or setting swop live for neutral in the mains plug and power it up again. If the light is brighter and the device makes a louder buzzing noise then the polarity was correct in the first place. However, if the light is dimmer then the new configuration is



correct. The Elfix costs approximately £15.

CD SENSITIVITY

It is now clear that despite initial claims about CD players being immune to external vibration, CD players do in fact appreciate isolation as much – if not more so – than the next component. The heavily home-tweaked player that Paul Messenger wrote about in January's *Personal Messages* column is heavily damped with Bluetack and utilises a basic sprung suspension; as indeed do many production units these days, although the design of the affordable ones leaves something to be desired.

Given this state of affairs it seems logical to use some form of base, table or isolation feet in an attempt to decouple the player from the floor, sideboard, amplifier or whatever it's sitting on. To this end the Monster corporation has produced a range of devices for this purpose called *CD Footers*. These are like enlarged versions of the feet found on CD players but made of a rubber-like material that Monster calls *Isotec*. It's similar to *Sorbothane* but is lighter and doesn't have the same stickiness, the claims made for it being much the same; ie the ability to absorb and dissipate energy.

Footers come in two sizes: the larger ones have an aluminium ring for rigidity as much as aesthetics, and the smaller ones are available individually or as part of the *Tranquility Base* (can you dig it?). Prices seem on the high side when compared with the likes of *Sorbothane*, the small feet costing £35 and the large ones £60 for a set of four. The base weighs in at a hefty £199!

The search for the sonic improvements that the *Footers* might bring about started with placing them between the aforemen-

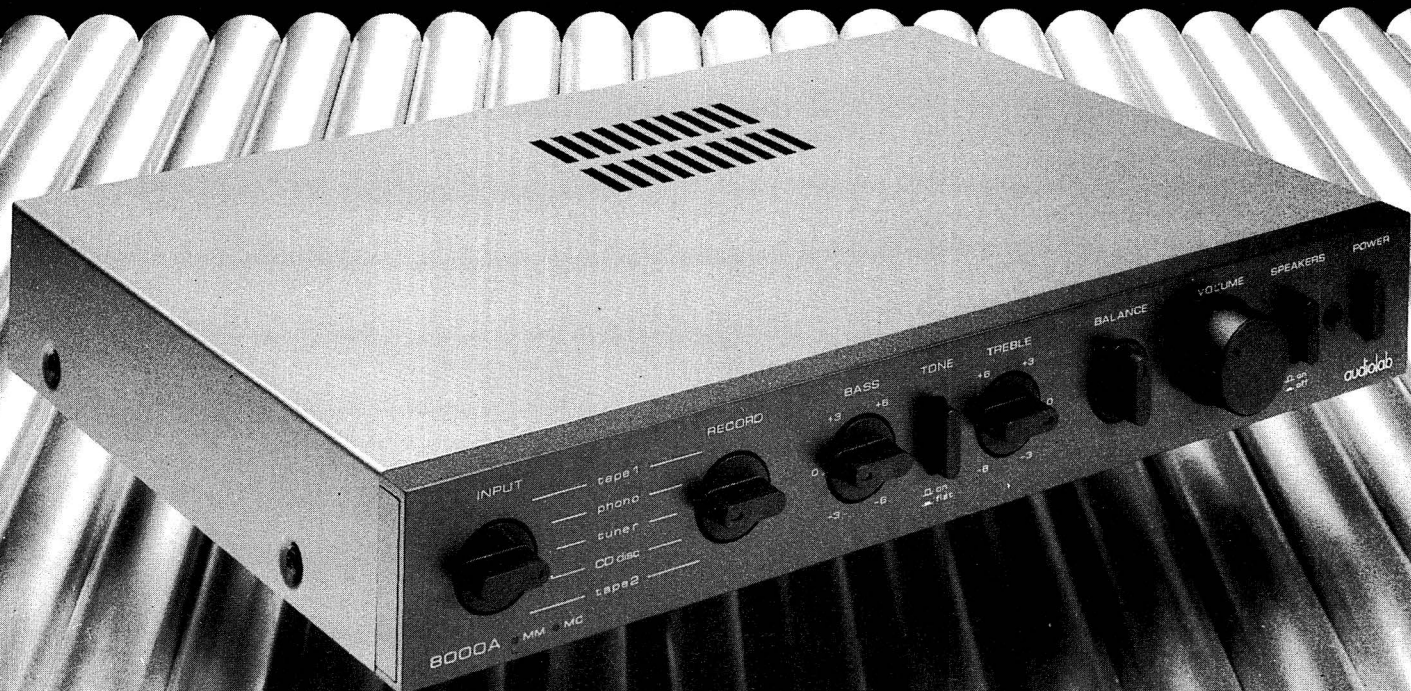
Damp those vibes with a carefully applied bit of Q-damping.

AUDIOLAB

8 0 0 0 A I N T E G R A T E D A M P L I F I E R

Our goal is perfection and many advances have been made since the original Audiolab 8000A. But there are two things we wouldn't change, the model number and the enthusiastic reviews... even with the most delicate signals there is a wonderful musical harmony... something only a few audiophile pre-amps can improve on... the more I think about it, the more I realise I never heard a better integrated amplifier. **Ulrich Michalik, Hi-Fi exclusiv II/89**... The 8000A is immaculately constructed. This is a very competent design technically. Via CD... proves a real winner. **Hi-Fi Choice Sep 89**... a ready ability to deliver high power levels without any suggestion of strain, it works efficiently and with near ideal control and resolution deep into the bass... the phono input is of comparably high standard... **Alvin Gold, Hi-Fi Answers Aug 89**...

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



tioned Marantz *CD65IISE* player and a TCS table. The result was a very subtle improvement. Thinking that the table might be doing a pretty good job already, it was abandoned and the player placed directly on the floor, then tried with the feet. Once again only a slight improvement was noted, it being in the sense of rhythm and timing which results from better low frequency definition. Trying the expensive *Tranquility Base* under the same circumstances didn't produce particularly startling results either, basically a reduction in HF hash creating a more relaxed feel. In an attempt to find something even more lively than the floor the *CD65* was placed on top of a large-ish chest of drawers. Putting either the big feet or the *Base* between this and the player did afford a reasonable improvement to overall coherence and the resolution of low level detail, to the extent that previously obscure lyrics became intelligible.

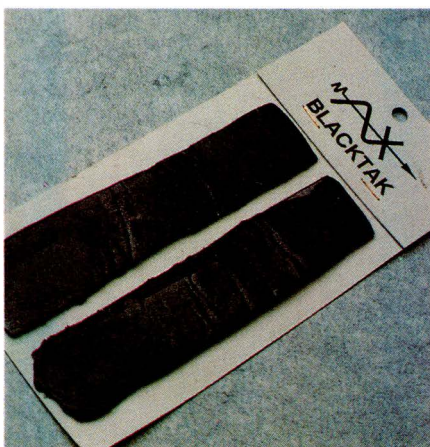
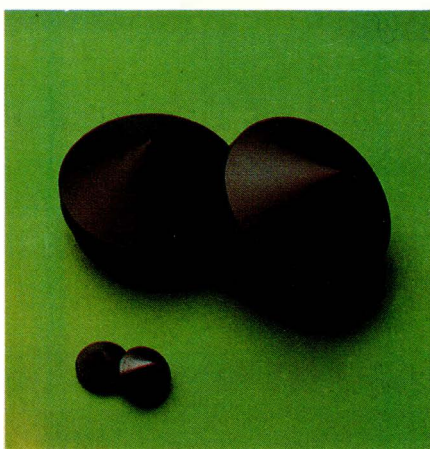
At the end of the day CD players do appreciate isolation and *CD Footers* do provide reasonable decoupling, especially if your player sits on other components or a piece of regular living room furniture. Whether they are good enough to warrant the price tags will depend on the circumstances of use; if you already use a 'hi-fi' table then the advantages will only be small but if the system is stacked up in a conventional manner then these devices may well prove worthwhile.

The more adventurous amongst you can do things like removing the (often flimsy) metal casing and damping it, or even making up some kind of clamp to improve rigidity. This latter tweak is merely a copy of what's found on more expensive players such as those from Micromega and Krell and the top-of-the-range Marantz and Sony models.

THE WELL DAMPED TURNTABLE

Another component that benefits from selective damping is of course the turntable. The careful application of an energy absorbing stick-on material can have significant effects on your record player's performance. We tried the thick green sheet material distributed by Quantum Audio and called *Q-Damping*.

In the case of the uprated Systemdek mentioned earlier, the idea of the platter and armboard kit was to remove all damping from the platter/subchassis/armboard part of the deck so that resonances could 'flow' into the subchassis and be dissipated. Theoretically, then, material such as *Q-Damping* should not be used on any of these parts. Indeed, placing some on the headshell resulted in a cutting out of very high frequency information. However, putting three strips under the platter, but not between it and the sub platter, improved bass extension and weight. This could be put down to the increased flywheel effect that this extra weight creates. It's hard to tell exactly what's going on, but, put it this



The hard and soft approaches to speaker/stand interfacing – top, cones from Partington and Heco, and below, Axhorn's Ax Blacktak.

way, I didn't want to take them off. Going on a suggestion from our News Ed, some *Q-Damping* was wrapped around the body of the motor, a tricky but easily reversible experiment. This had a far greater effect than the pieces under the platter; it dramatically increased the three dimensional tangibility of the sound by increasing image width and depth. *Q-Damping* and sheet *Sorbothane* are well worth experimenting with on any part of a component that needs to dissipate energy, but it's always as well to remove the stuff after a while to make sure that pros outweigh the cons and you've not lost something in the process of gaining something else.

CRITICAL INTERFACING

In our last review of loudspeaker stands (Issue 58) Paul Miller came to the conclusion that Blu-tack made a better speaker/stand interface than screw-in spikes. Whether this remains true in all cases is nigh-on impossible to assess but on the whole we have found the assessment to be correct. However, there are now a few alternatives available that claim to improve on both Blu-tack and regular spikes. These include something called *Blacktak* which is distributed by Axhorn. Although superficially like its blue cousin it has a different consistency and 'feel' – it's a lot more elastic and *very* sticky. Price is a very reasonable £2 a pack. Using it instead of Blu-tack between a pair of Snell

Ks and reasonably hefty *Pirate* stands resulted in an all round improvement in the sound quality emanating from these capable speakers, its most noteworthy attributes being an increase in dynamic contrast – ie the attack and decay of individual notes became more pronounced and acoustic recordings sounded more natural. It came as no surprise to hear that Audio by Design actually recommends the stuff!

Another approach is to use cones betwixt speaker and stand. These are available in all shapes and sizes – and prices – so we decided to listen to some from the top and bottom of the price range; at £5.95 for six you can have Partington *Toppers* which are 10mm high, steel and have sticky bases; alternatively at £49 for eight there's the German alternative from Heco in the form of a 30mm high combination of hard rubber and metal. With the speakers and stands mentioned above the *Toppers* reduced bass definition and created a brighter, more splashy balance, that under the circumstances was less appealing than that achieved with *Blacktak*. The Heco *FSP2* cones, used three per speaker, combined the qualities created by the *Toppers* with some of those found with *Blacktak*. With these the bass was full and controlled but high frequencies lacked the naturalness that could be heard with *Blacktak*.

At the end of the day *Ax Blacktak* (as it's called) was found to be the most suitable interface for this particular set-up and has taken up permanent residence between the Ks and their stands. However, it's important to bear in mind that different speaker/stand combinations may not react in the ways described above – so experimentation is, as ever, the key.

CONCLUSIONS

Hopefully it will be obvious to anyone who hasn't skipped the article and gone straight to the conclusion that there are no hard and fast rules for tweaking. Its essence is *experimentation* and plenty of listening. It's remarkable how little things can make a big difference to the fidelity of a system – and equally surprising how the opposite can sometimes be the case. Either way it usually pays to be brave and have a go. You never know what you might achieve.

Audio by Design, Unit 8 Dyke Rd. Mews,
74-76 Dyke Rd., Brighton BN1 3JD.
Tel: (0273) 203277.

Axhorn, Esgair, Llansawel, Llandeilo,
Dyfed SA19 7PE. Tel: (05583) 559.

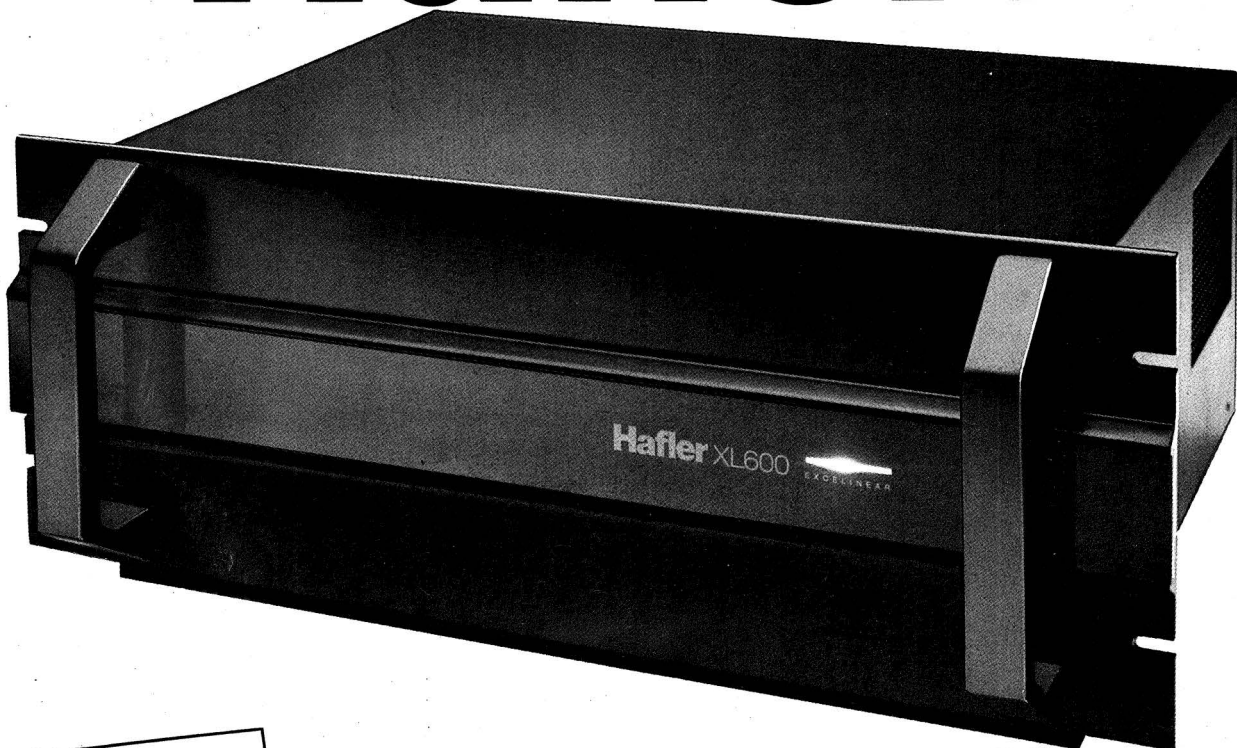
Mana Acoustics, 59 Jubilee Close, Pinner,
Middlesex HA5 3TB. Tel: (01) 429 0118.

Quantum Audio, PO Box 26, Kilmarnock
KA3 7BN. Tel: (0563) 71122.

Russ Andrews, Edge Bank House,
Skelmsmergh, Kendal, Cumbria LA8 9AS.
Tel: (053 983) 247.

Zenonlec, Fourbury House, 36 Victoria Rd.,
Mortimer RG7 3SG. Tel: (0734) 333636.

Bigger... Better... Hafler!



“very impressive specification . . . the XL600 can be unreservedly recommended.”

GRAMOPHONE
SEPT. 1989

“IT WAS DIFFICULT NOT TO BE IMPRESSED . . . A CONSIDERED BLEND OF FLEXIBILITY, GOOD SOUND AND VALUE FOR MONEY”

New Hi-Fi Sound
June 1989

“this amplifier does indeed represent fine value, while the big and very natural sound quality must surely place it near the top of any enthusiast's shopping list...highly recommended.”

HI-FI CHOICE
September 1989

“Superb bass control, very high power output capability, modest price . . . the XL600 represents impressive value for money.”

WHICH COMPACT
DISC April 1989

Applying the recognised success of the Hafler XL280 amplifier which has a truly linear transfer characteristic, the new XL600 heralds a new era of affordable high powered accuracy. It has already won wide acclaim amongst press and public alike.

From its gold plated input and output jacks to its relay-protected output, which exceeds 1000 watts mono and 360 watts

per channel stereo into 8 ohms, this is an amplifier to be compared by any standards with the most expensive alternatives. Audition the XL600 at your nearest Hafler dealer soon.

Hafler

HW International, 3-5 Eden Grove, London N7 8EQ.
Tel: 01-607 2717

To: HW International, 3-5 Eden Grove, London N7 8EQ. Please send me details of the Hafler Range.

Name _____ Address _____ Post code _____

AUDIOPHILE RECORDINGS

In conjunction with hi-fi distributor Audiofreaks, Hi-Fi Choice can now offer its readers a selection of hard-to-find audiophile records and CDs.

Thanks to an exclusive deal with Audiofreaks, *Choice* has now sourced a variety of high quality Norwegian jazz recordings which are superb hi-fi demonstration records – plus the fabulous *Paganiniana* recording by Water Lily Acoustics of America, sponsored by Conrad-Johnson. As we find more good discs, we hope to add them to the list.

You might stumble across one or two of these records in some specialist hi-fi shops, but for the most part these albums are not readily available in the UK. You certainly won't find them in your local record store! So we are delighted to be able to make them available to *Choice* readers by mail order. We're sure you will enjoy them.

Please note: two of the discs – the Gemini and Odin samplers – are available only on Compact Disc.

RADKA TONEFF: Fairytale

CD: Odin CD03
LP: Odin LP03

The well known audiophile (digital) recording of female voice and piano. An international best seller, despite having been only sporadically available in this country. Enchanting songs.

ODIN SAMPLER

CD: NJ-4028-2

The Odin record label was established by the Norwegian Jazz Federation in 1981. This 75-minute compilation on CD provides a comprehensive taster from the label's catalogue. Not available on vinyl.

GEMINI/TAURUS SAMPLER

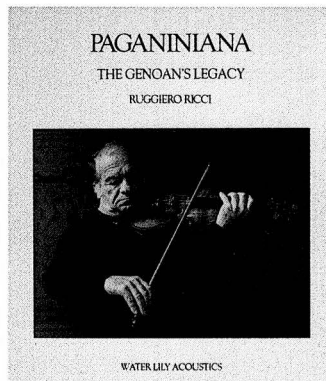
CD: GMCD 6239

A pure jazz label, Gemini Records was formed by producer Bjorn Petersen to record Norwegian jazz musicians who deserve wider recognition. Taurus is a subsidiary label presenting less mainstream music. This 15-track sampler is available only on CD.

SMITH/RICCI: Paganiniana

CD: CJCD
LP: CJLP

Breathtaking, purist analogue audiophile recording of classical works performed on piano and violin. On the Water Lily Acoustics label, sponsored by Conrad-Johnson and imported from



America. An essential addition to any audiophile's record collection.

TOTTI BERGH: I Hear A Rhapsody

CD: GMCD 48
LP: GMLP 48

On the Gemini label, saxophonist Totti Bergh plays a selection of jazz standards. *Jazz Journal* magazine described this as "A delightful 'wee small hours' album."

LAILA DALSETH: A Time For Love

CD: GMCD 51
LP: GMLP 51

Another recording from the Gemini catalogue, this time featuring the golden voice of Laila Dalseth – with Red Mitchell on string bass.

FLIP PHILIPS/KENNY DAVERN/BJARNE NEREM: Mood Indigo

CD: GMCD 59
LP: GMLP 59

Excellent mainstream playing by three great gentlemen of jazz. Recorded during the 1987 Oslo jazz festival.

BJORN JOHANSEN: Take One

CD: NJ4021-2
LP: NJ4021-1

Norway's top tenor sax player and his dream band, recorded in a one-night session at Rainbow studios in Oslo. Featuring Cedar Walton, David Williams and Billy Higgins.

JON EBERSON: Stash

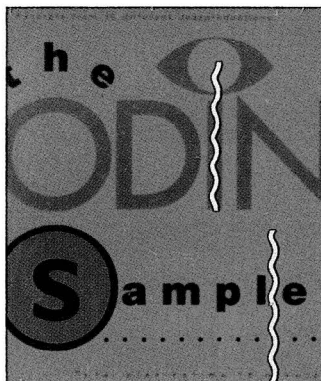
CD: Odin CD19
LP: Odin LP19

An exciting trio session with one of Norway's top guitarists. Featuring Terje Rypdal's rhythm section Bjorn Kjellemyr (bass) and Audun Kleive (drums).

CALEDONIA JAZZBAND: Walkin'

CD: HCRCD 38
LP: HCRLP 38

Genuine New Orleans jazz/calypso/R&B/marching band with Wendell Brunious in the frontline on trumpet.



TO ORDER YOUR LPs AND CDs

(Tick selections)

All prices include VAT and postage and packing

Radka Toneff: *Fairytale*

1 CD Odin CD03 (£14.95)

1 LP Odin LP03 (£12.95)

Odin Sampler

2 CD NJ-4028-2 (£14.95)

Gemini/Taurus Sampler

3 CD GMCD 6239 (£14.95)

Totti Bergh: *I Hear A Rhapsody*

4 CD GMCD 48 (£14.95)

4 LP GMLP48 (£12.95)

Laila Dalseth: *A Time For Love*

5 CD GMCD 51 (£14.95)

5 LP GMLP 51 (£12.95)

Flip Philips/Kenny Davern/Bjarne Nerem: *Mood Indigo*

6 CD GMCD 59 (£14.95)

6 LP GMLP 59 (£12.95)

Bjorn Johansen: *Take One*

7 CD NJ4021-2 (£14.95)

7 LP NJ4021-1 (£12.95)

Jon Ebersson: *Stash*

8 CD Odin CD19 (£14.95)

8 LP Odin LP19 (£12.95)

Caledonia Jazzband: *Walkin'*

9 CD HCRCD 38 (£14.95)

9 LP HCRLP 38 (£12.95)

Smith/Ricci: *Paganiniana*

10 CD CJCD (£17.95)

10 LP CJLP (£14.95)

PAYMENT

I enclose my cheque/PO made payable to Dennis Publishing

for £ _____

Total number of items ordered _____

Please charge my Mastercard (Access)/Visa (delete as appropriate)

Credit card number _____

Expiry date _____

Signature _____

Name _____

Address _____

Postcode _____

HFCA 80

Please send order form with payment to:
Hi-Fi Choice Mail Order, PO Box 320, London N21 2NB

Please allow 28 days for delivery

Available to UK readers only

AUDIOPHILE RECORDINGS

In conjunction with hi-fi distributor Audiofreaks, Hi-Fi Choice can now offer its readers a selection of hard-to-find audiophile records and CDs.

Thanks to an exclusive deal with Audiofreaks, *Choice* has now sourced a variety of high quality Norwegian jazz recordings which are superb hi-fi demonstration records – plus the fabulous *Paganiniana* recording by Water Lily Acoustics of America, sponsored by Conrad-Johnson. As we find more good discs, we hope to add them to the list.

You might stumble across one or two of these records in some specialist hi-fi shops, but for the most part these albums are not readily available in the UK. You certainly won't find them in your local record store! So we are delighted to be able to make them available to *Choice* readers by mail order. We're sure you will enjoy them.

Please note: two of the discs – the Gemini and Odin samplers – are available only on Compact Disc.

RADKA TONEFF: Fairytale

CD: Odin CD03
LP: Odin LP03

The well known audiophile (digital) recording of female voice and piano. An international best seller, despite having been only sporadically available in this country. Enchanting songs.

ODIN SAMPLER

CD: NJ-4028-2

The Odin record label was established by the Norwegian Jazz Federation in 1981. This 75-minute compilation on CD provides a comprehensive taster from the label's catalogue. Not available on vinyl.

GEMINI/TAURUS SAMPLER

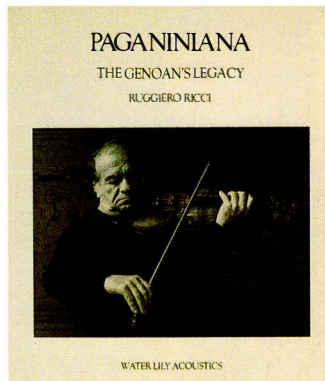
CD: GMCD 6239

A pure jazz label, Gemini Records was formed by producer Bjorn Petersen to record Norwegian jazz musicians who deserve wider recognition. Taurus is a subsidiary label presenting less mainstream music. This 15-track sampler is available only on CD.

SMITH/RICCI: Paganiniana

CD: CJCD
LP: CJLP

Breathtaking, purist analogue audiophile recording of classical works performed on piano and violin. On the Water Lily Acoustics label, sponsored by Conrad-Johnson and imported from



America. An essential addition to any audiophile's record collection.

TOTTI BERGH: I Hear A Rhapsody

CD: GMCD 48
LP: GMLP 48

On the Gemini label, saxophonist Totti Bergh plays a selection of jazz standards. *Jazz Journal* magazine described this as "A delightful 'wee small hours' album."

LAILA DALSETH: A Time For Love

CD: GMCD 51
LP: GMLP 51

Another recording from the Gemini catalogue, this time featuring the golden voice of Laila Dalseth – with Red Mitchell on string bass.

FLIP PHILIPS/KENNY DAVERN/BJARNE NEREM: Mood Indigo

CD: GMCD 59
LP: GMLP 59

Excellent mainstream playing by three great gentlemen of jazz. Recorded during the 1987 Oslo jazz festival.

BJORN JOHANSEN: Take One

CD: NJ4021-2
LP: NJ4021-1

Norway's top tenor sax player and his dream band, recorded in a one-night session at Rainbow studios in Oslo. Featuring Cedar Walton, David Williams and Billy Higgins.

JON EBERSON: Stash

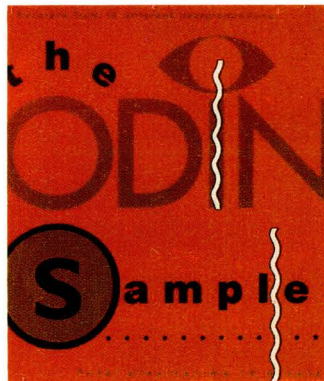
CD: Odin CD19
LP: Odin LP19

An exciting trio session with one of Norway's top guitarists. Featuring Terje Rypdal's rhythm section Bjorn Kjellemyr (bass) and Audun Kleive (drums).

CALEDONIA JAZZBAND: Walkin'

CD: HCRCD 38
LP: HCRLP 38

Genuine New Orleans jazz/calypso/R&B/marching band with Wendell Brunious in the frontline on trumpet.



TO ORDER YOUR LPs AND CDs

(Tick selections)

All prices include VAT and postage and packing

Radka Toneff: *Fairytale*

1 CD Odin CD03 (£14.95)

1 LP Odin LP03 (£12.95)

Odin Sampler

2 CD NJ-4028-2 (£14.95)

Gemini/Taurus Sampler

3 CD GMCD 6239 (£14.95)

Totti Bergh: *I Hear A Rhapsody*

4 CD GMCD 48 (£14.95)

4 LP GMLP48 (£12.95)

Laila Dalseth: *A Time For Love*

5 CD GMCD 51 (£14.95)

5 LP GMLP 51 (£12.95)

Flip Philips/Kenny Davern/Bjarne Nerem: *Mood Indigo*

6 CD GMCD 59 (£14.95)

6 LP GMLP 59 (£12.95)

Bjorn Johansen: *Take One*

7 CD NJ4021-2 (£14.95)

7 LP NJ4021-1 (£12.95)

Jon Ebersson: *Stash*

8 CD Odin CD19 (£14.95)

8 LP Odin LP19 (£12.95)

Caledonia Jazzband: *Walkin'*

9 CD HCRCD 38 (£14.95)

9 LP HCRLP 38 (£12.95)

Smith/Ricci: *Paganiniana*

10 CD CJCD (£17.95)

10 LP CJLP (£14.95)

PAYMENT

I enclose my cheque/PO made payable to Dennis Publishing

for £ _____

Total number of items ordered _____

Please charge my Mastercard (Access)/Visa (delete as appropriate)

Credit card number _____

Expiry date _____

Signature _____

Name _____

Address _____

Postcode _____

HFCA 80

Please send order form with payment to:
Hi-Fi Choice Mail Order, PO Box 320, London N21 2NB
Please allow 28 days for delivery
Available to UK readers only



READERS WRITE CHOICE ANSWERS

THE FINAL UPGRADE

I have a budget of £2,000 and wish to upgrade my system for the last time. At present I have a Linn LP12/Ittok with a K9 cartridge, Sugden A25 and Heybrook HB1s. The latter three items are being traded in for good stands and cables.

I would like your advice on a cartridge, amplifier and loudspeakers to audition. My own not-so-short shortlist consists of the following: Linn Karma or AT OC9 cartridge and MF Pre 3/P140, Naim 62/90 and Mission Cyrus 2/PSX amplifiers. My real problem however (apart from being a female in a man's world) is loudspeaker choice, my listening room is 15 x 12ft and speaker size and position isn't a problem. But paring down the list is somewhat more difficult. I've got it down to Rogers LS7t, JBL 60T, Linn Sara 9, Gale 402 and Musical Fidelity MC4.

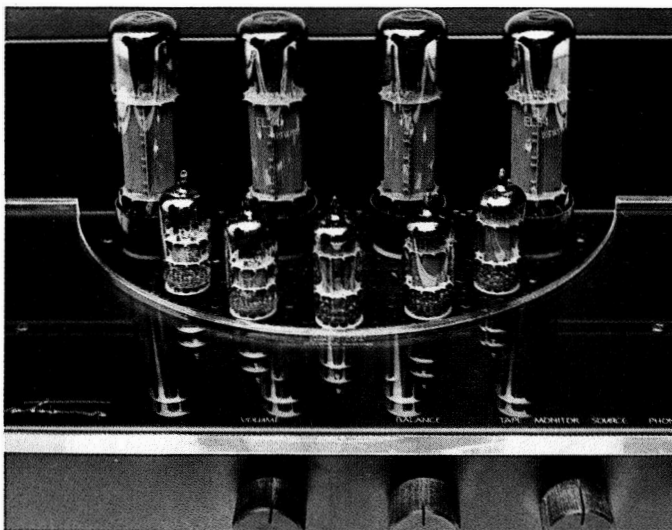
I prefer a warm and powerful bass and clean but laid-back mid top and listen to rock, folk and blues music with the occasional bit of jazz. And on a different note why are women not taken seriously by hi-fi dealers? It's like trying to get into a secret order.

HELEN HART,
DUMBARTON.

To address your last point first, most hi-fi dealers have only come across the fairer sex in the context of a wife who doesn't like big speakers in the living-room, and unfortunately are not the most socially aware of creatures. If it's any consolation male members of the Choice staff have had similar problems, but what can you do?

But on to more thrilling issues, vis some new speakers, an amplifier and a cartridge. We note that despite the fact that you have been using a Sugden integrated amp you don't seem to be considering one of the pre/power combinations, which as transistor amplifiers go aren't too shabby.

However, given the available funds and your proposal to make this your final upgrade we have no hesitation in recommending the following components: Audio Technica AT-OC7 cartridge, Audio



Innovations Series 800 moving coil transformer, Innovations Series 500 integrated amplifier, Snell JII loudspeakers and Pirate four-leg stands, with any extra funds spent on the best Audio Note interconnect and speaker cable you can afford.

Although this system bears little relation to your shortlist it is in our opinion the best one given your budget. Pre/power combinations of the transistorised variety offer more in the way of punch and loudness but they will sound more distorted at high frequencies as well, and judging from your personal taste this isn't what you're after. On the other hand, the Series 500 valve amp sounds your cup of tea. Search out a dealer and do some listening.

A HUMDINGER

My system is as follows: Linn LP12/Ittok/Karma, Musical Fidelity MVX 2 pre and MA100 power amps feeding Spendor SPI100 speakers via Lifeline cable. I have a problem with hum - when playing records with the volume knob set at between the two and three o'clock positions there is a loud hum between tracks and during quiet passages.

As I'm about due for a cartridge change can you recommend a selection with higher outputs and sound quality than the Karma. My budget is between £400 and £900.

B. STANLEY,
WORTHING, W. SUSSEX.

The hum problem you're encountering is not or shouldn't be caused by the low output of the Karma. There are a number of fault related causes that would explain this situation and a few set-up oriented ones. However, as it's not a question of compatibility this is really a query for your dealer and we suggest you throw it at him.

As for a cartridge upgrade, there's quite a variety of options but the traditional first choice would be a Troika. However, if you're the adventurous type then something like an Audio Technica AT OC9 would be well worth investigating.

HOOKING UP HANG-UPS

Following your review of the Sony TA-F-630 ESD in the September issue of your excellent journal I ordered one of these amplifiers which, although in short supply, eventually arrived. But I have a query regarding set-up. Your



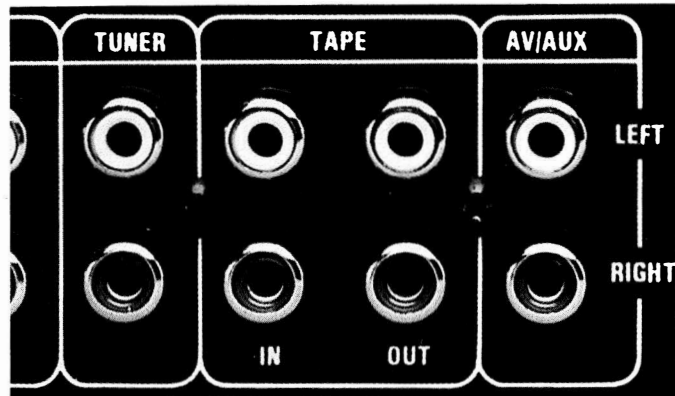
Left: Rock'n'roll ain't no riddle, to a tube amp it makes good, good sense. Above: An alternative upgrade for the daring Sondek owner.

reviewer points out that "it is possible to re-route the signal immediately after the PDM converter using the tape monitor loop".

Can you explain simply (I am just about capable of wiring a 13 amp plug!) just how this is carried out. I can't see any output marked 'tape monitor' and even if I knew where it was, what would I connect to it?
GILBERT WATTS,
NEWPORT, I.O.W.

What Paul Miller suggested is that if you want to use the TA-F-630 purely as a digital to analogue converter the signal is best taken to your preamp by connecting its CD input to the 'rec out' sockets on the Sony.

The tape monitor loop is accessed by the tape in and out sockets on any amplifier, and tape out, rec out or whatever it's marked as, emits a fixed level signal that comes almost directly



The ins and outs of signal routing.



READERS WRITE CHOICE ANSWERS

THE FINAL UPGRADE

I have a budget of £2,000 and wish to upgrade my system for the last time. At present I have a Linn LP12/Ittok with a K9 cartridge, Sugden A25 and Heybrook HB1s. The latter three items are being traded in for good stands and cables.

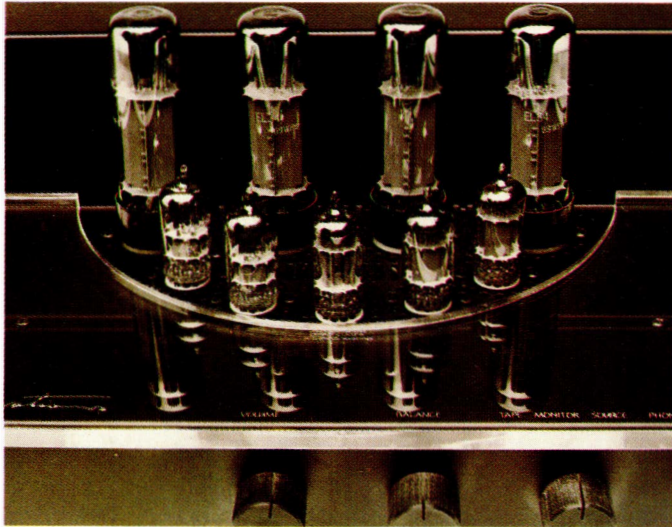
I would like your advice on a cartridge, amplifier and loudspeakers to audition. My own not-so-short shortlist consists of the following: Linn Karma or AT OC9 cartridge and MF Pre 3/P140, Naim 62/90 and Mission Cyrus 2/PSX amplifiers. My real problem however (apart from being a female in a man's world) is loudspeaker choice, my listening room is 15 x 12ft and speaker size and position isn't a problem. But paring down the list is somewhat more difficult. I've got it down to Rogers LS7i, JBL 60T, Linn Sara 9, Gale 402 and Musical Fidelity MC4.

I prefer a warm and powerful bass and clean but laid-back mid-top and listen to rock, folk and blues music with the occasional bit of jazz. And on a different note why are women not taken seriously by hi-fi dealers? It's like trying to get into a secret order.
HELEN HART,
DUMBARTON.

To address your last point first, most hi-fi dealers have only come across the fairer sex in the context of a wife who doesn't like big speakers in the living-room, and unfortunately are not the most socially aware of creatures. If it's any consolation male members of the Choice staff have had similar problems, but what can you do?

But on to more thrilling issues, vis some new speakers, an amplifier and a cartridge. We note that despite the fact that you have been using a Sugden integrated amp you don't seem to be considering one of the pre/power combinations, which as transistor amplifiers go aren't too shabby.

However, given the available funds and your proposal to make this your final upgrade we have no hesitation in recommending the following components: Audio Technica AT-OC7 cartridge, Audio



Innovations Series 800 moving coil transformer, Innovations Series 500 integrated amplifier, Snell J11 loudspeakers and Pirate four-leg stands, with any extra funds spent on the best Audio Note interconnect and speaker cable you can afford.

Although this system bears little relation to your shortlist it is in our opinion the best one given your budget. Pre/power combinations of the transistorised variety offer more in the way of punch and loudness but they will sound more distorted at high frequencies as well, and judging from your personal taste this isn't what you're after. On the other hand, the Series 500 valve amp sounds your cup of tea. Search out a dealer and do some listening.

A HUMDINGER

My system is as follows: Linn LP12/Ittok/Karma, Musical Fidelity MVX 2 pre and MA100 power amps feeding Spendor SP100 speakers via Lifeline cable. I have a problem with hum – when playing records with the volume knob set at between the two and three o'clock positions there is a loud hum between tracks and during quiet passages.

As I'm about due for a cartridge change can you recommend a selection with higher outputs and sound quality than the Karma. My budget is between £400 and £900.

B. STANLEY,
WORTHING, W. SUSSEX.

The hum problem you're encountering is not or shouldn't be caused by the low output of the Karma. There are a number of fault related causes that would explain this situation and a few set-up oriented ones. However, as it's not a question of compatibility this is really a query for your dealer and we suggest you throw it at him.

As for a cartridge upgrade, there's quite a variety of options but the traditional first choice would be a Troika. However, if you're the adventurous type then something like an Audio Technica AT OC9 would be well worth investigating.

HOOKING UP HANG-UPS

Following your review of the Sony TA F-630 ESD in the September issue of your excellent journal I ordered one of these amplifiers which, although in short supply, eventually arrived. But I have a query regarding set-up. Your



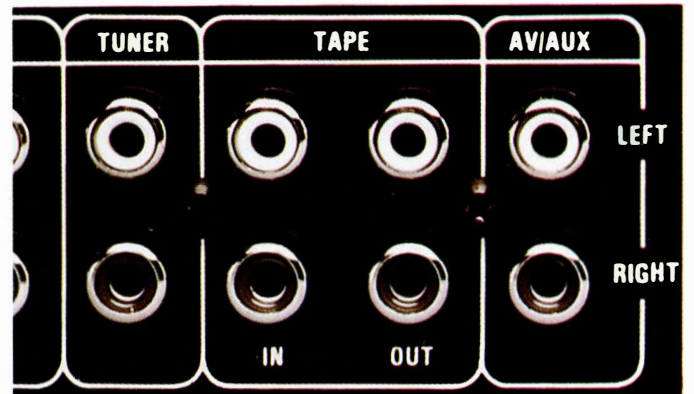
Left: Rock'n'roll ain't no riddle, to a tube amp it makes good, good sense. Above: An alternative upgrade for the daring Sondek owner.

reviewer points out that "it is possible to re-route the signal immediately after the PDM converter using the tape monitor loop".

Can you explain simply (I am just about capable of wiring a 13 amp plug!) just how this is carried out. I can't see any output marked 'tape monitor' and even if I knew where it was, what would I connect to it?
GILBERT WATTS,
NEWPORT, I.O.W.

What Paul Miller suggested is that if you want to use the TA-F-630 purely as a digital to analogue converter the signal is best taken to your preamp by connecting its CD input to the 'rec out' sockets on the Sony.

The tape monitor loop is accessed by the tape in and out sockets on any amplifier, and tape out, rec out or whatever it's marked as, emits a fixed level signal that comes almost directly



The ins and outs of signal routing.

from the signal being input to the amp, whatever the source. Apart from slightly left field uses such as Paul was suggesting, and the more obvious tape recording monitoring with three head machines, the tape loop can be used to incorporate devices like surround sound decoders and graphic equalisers into a system.

THE INACTIVE ALTERNATIVE

Could you please give me some advice concerning my current system. I have a Marantz CD65IISE, Musical Fidelity Preamp 2A and MA50 monoblocks, Rogers Studio 1As on Target stands. I use Kimber interconnect and Naim speaker cable (bi-wired). I also occasionally use a NAD 4225 tuner.

I am considering upgrading my preamp and although the obvious choice would be the Musical Fidelity 3A I am also tempted by valve preamplification. I read your amplifier reviews in issue 77 with great interest and was initially surprised by your comments concerning the Audion CDI preamp, "Why buy a £399 preamp when no preamp would be better?" On reflection why should I be surprised? Reducing signal path and unnecessary equipment has been an audiophile aim for many years. I then hurriedly looked at some of my many back issues to read recent CD reviews. What should I find but passive volume controls listed amongst the equipment used, including the big brother versions of my own amps the MA100s.

Could you supply me with the manufacturers of passive volume controls, perhaps with an indication of which might be suitable for my system. Would this be a good future review for your magazine? There seems to be a definite 'black hole' of information on this subject.

IAN WIEBKIN,
PULBOROUGH, WEST SUSSEX.

You're right, passive preamps have been largely ignored by the audio press and are ripe for investigation. To our knowledge these apparently simple control boxes are produced by QED and RTJ which both make competitively priced models, whilst the American companies Cello and Mod Squad produce more glamorous and expensive models. The latter company makes a unit called the Line Drive which is highly acclaimed in the States and retails for about £499. It seems a lot to pay for a passive device, but at least it looks the biz and who knows it may have something that other such components don't.

To find out more about the genre as a whole we have commissioned Paul Miller to look into the pros and cons of passive preamps and to report his findings on a few examples. With luck and a following wind this will appear in the May issue along with a big batch of loudspeakers.

SPOT THE DIFFERENCE

Can you help settle the following dilemma? I want to upgrade my Technics SL-P220 CD player, which cost about £260 two years ago. A friend has been enthusing over his new Pioneer PD-91 (£800), which you have also reviewed very favourably. Before buying the Pioneer I thought I would listen to it alongside the Technics, using the Pioneer's set-up of Macintosh valve amp and AR speakers. Both CD players were loaded with identical discs (Rattle's Mahler 2) and set running five seconds apart. We were not able to see which player we were hearing and at intervals the sound was switched from one to the other.

After much agonising we both had to admit that we could not identify the Pioneer – both sounded equally good. We then switched the interconnects – Technics standard leads and the

£35 a time specials fitted to the Pioneer. Again we were not able to detect any difference. We both wanted to identify the Pioneer as the superior player – the owner because he felt he had a superior product, and I because I was about to buy the same. Have I saved myself an expensive purchase – or who is fooling who?
CHRISTOPHER ANGELOGLOU.

What you have discovered is that the difference between many CD players of similar vintage is remarkably small, and that really transparent equipment is needed to hear those small differences. However, since their introduction in the early '80s CD players improved markedly, although admittedly only in small steps, and reviewers tend to exaggerate the differences they hear through very revealing equipment.

The latest flavour of the month amongst certain reviewers is bitstream, a low bit high oversampling digital to analogue conversion technique which by all accounts offers a 'different' CD sound. As yet there are only a few players from Philips, Technics, Meridian, Harman Kardon and Rotel and one separate converter (for players with a digital output) that use bitstream technology. If you are tired of the sound of your SL-P220 one of these players, at least, would be worth a listen so take your player along to a shop and make some comparisons.

PHIL A. VOYD – WHO HE?

During the lazy between-meal-breaks over Christmas I decided to catch up on the hi-fi scene with a spot of back reading. One bit of nonsense which caught my attention was a piece describing the Voyd turntable (July 1989). Since the account contained a few errors I feel it appropriate that a couple of them be rectified. If you examine an early example of the aforementioned turntable you will find affixed thereto a brass plaque bearing the legend 'Designed by Philip Voyd. Made in England'. Guy Adams is not, therefore, entitled to answer questions addressed to the designer of the Voyd turntable.

The original Reference turntable built by Philip Voyd has a precision bearing and a Lexan platter but has two opposing motors which more accurately realise the principle expounded by the true designer and so accurately repeated by Guy Adams.

J. F. HARE
(ONE HALF OF PHILIP VOYD),
SHEFFIELD

One half of Philip Voyd, eh? How do you become one half of a fictitious character? An explanation is required perhaps; Philip A. Voyd was a lighthearted pseudonym that the more cryptically inclined might notice could be read as 'fill a void', because the designers felt that there was a void in the turntable market!

This brings us to the origin of this particular transcriber. The inspiration behind the first two-motor Voyd came from an article in the French magazine L'Audiophile printed in 1981, and the first deck was built around this time by Les Wolstenholme of Avondale Audio – it is one of these that you are referring to. The original three-motor Voyd was designed and built by Guy Adams and Guy Sargeant and first saw the light of day in 1985. All subsequent Voyd turntables have been built by Voyd Ltd which is run by Guy Adams.

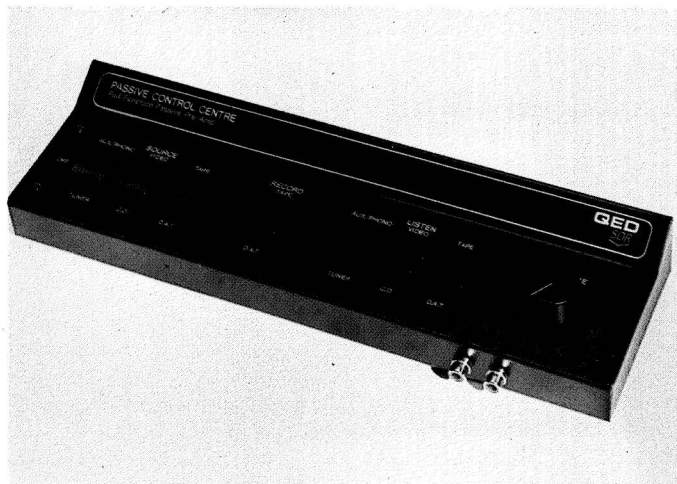
BUDGET AMP

As a lowly student my purchasing power limits me to budget equipment, so bearing this in mind could you recommend an amplifier to replace the rather unimpressive JVC AX-330 that I use at present. The rest of my system is made up of a Dual CS505-3 turntable, Denon DRM-700 cassette deck and Mission 707 loudspeakers.

I have shortlisted the following three amplifiers: Harman/Kardon 6100, Denon PMA 320 and Arcam Delta 60. Given that I primarily listen to rock music, ie Whitesnake, Zappa etc, which of the amplifiers would give me the best performance?

JASON CRAWFORD,
GLASGOW.

Of the amps you shortlist we have tested the HIK (issue 80) and the Arcam (issue 68), both being Recommended and thus definitely worth auditioning. Compatibility with your various source components will not be a problem but the match with your speakers is less predictable, in as much as the superficial presentation will probably vary slightly from amp to amp. It would therefore be wise to take your loudspeakers along to a dealer which stocks the two amps you list and have a good listen to both combinations. Try to listen at both low and high volume with a turntable as a source. Some dealers prefer using CD to demonstrate with, but the sound quality of phono stages can vary so it's a good idea to check them out.



The passive approach to CD preamplification.

from the signal being input to the amp, whatever the source. Apart from slightly left field uses such as Paul was suggesting, and the more obvious tape recording monitoring with three head machines, the tape loop can be used to incorporate devices like surround sound decoders and graphic equalisers into a system.

THE INACTIVE ALTERNATIVE

Could you please give me some advice concerning my current system. I have a Marantz CD65/ISE, Musical Fidelity Preamp 2A and MA50 monoblocks, Rogers Studio 1As on Target stands. I use Kimber interconnect and Naim speaker cable (bi-wired). I also occasionally use a NAD 4225 tuner.

I am considering upgrading my preamp and although the obvious choice would be the Musical Fidelity 3A I am also tempted by valve preamplification. I read your amplifier reviews in issue 77 with great interest and was initially surprised by your comments concerning the Audion CDI preamp, "Why buy a £399 preamp when no preamp would be better?" On reflection why should I be surprised? Reducing signal path and unnecessary equipment has been an audiophile aim for many years. I then hurriedly looked at some of my many back issues to read recent CD reviews. What should I find but passive volume controls listed amongst the equipment used, including the big brother versions of my own amps the MA100s.

Could you supply me with the manufacturers of passive volume controls, perhaps with an indication of which might be suitable for my system. Would this be a good future review for your magazine? There seems to be a definite 'black hole' of information on this subject.

IAN WIERKIN,
PULBOROUGH, WEST SUSSEX.

You're right, passive preamps have been largely ignored by the audio press and are ripe for investigation. To our knowledge these apparently simple control boxes are produced by QED and RTJ which both make competitively priced models, whilst the American companies Cello and Mod Squad produce more glamorous and expensive models. The latter company makes a unit called the Line Drive which is highly acclaimed in the States and retails for about £499. It seems a lot to pay for a passive device, but at least it looks the biz and who knows it may have something that other such components don't.

To find out more about the genre as a whole we have commissioned Paul Miller to look into the pros and cons of passive preamps and to report his findings on a few examples. With luck and a following wind this will appear in the May issue along with a big batch of loudspeakers.

SPOT THE DIFFERENCE

Can you help settle the following dilemma? I want to upgrade my Technics SL-P220 CD player, which cost about £260 two years ago. A friend has been enthusing over his new Pioneer PD-91 (£800), which you have also reviewed very favourably. Before buying the Pioneer I thought I would listen to it alongside the Technics, using the Pioneer's set-up of Macintosh valve amp and AR speakers. Both CD players were loaded with identical discs (Rattle's Mahler 2) and set running five seconds apart. We were not able to see which player we were hearing and at intervals the sound was switched from one to the other.

After much agonising we both had to admit that we could not identify the Pioneer – both sounded equally good. We then switched the interconnects – Technics standard leads and the

£35 a time specials fitted to the Pioneer. Again we were not able to detect any difference. We both wanted to identify the Pioneer as the superior player – the owner because he felt he had a superior product, and I because I was about to buy the same. Have I saved myself an expensive purchase – or who is fooling who? CHRISTOPHER ANGELOGLU.

What you have discovered is that the difference between many CD players of similar vintage is remarkably small, and that really transparent equipment is needed to hear those small differences. However, since their introduction in the early '80s CD players improved markedly, although admittedly only in small steps, and reviewers tend to exaggerate the differences they hear through very revealing equipment.

The latest flavour of the month amongst certain reviewers is bitstream, a low bit high oversampling digital to analogue conversion technique which by all accounts offers a 'different' CD sound. As yet there are only a few players from Philips, Technics, Meridian, Harman Kardon and Rotel and one separate converter (for players with a digital output) that use bitstream technology. If you are tired of the sound of your SL-P220 one of these players, at least, would be worth a listen so take your player along to a shop and make some comparisons.

PHIL A. VOYD – WHO HE?

During the lazy between-meal-breaks over Christmas I decided to catch up on the hi-fi scene with a spot of back reading. One bit of nonsense which caught my attention was a piece describing the Voyd turntable (July 1989). Since the account contained a few errors I feel it appropriate that a couple of them be rectified. If you examine an early example of the aforementioned turntable you will find affixed thereto a brass plaque bearing the legend 'Designed by Philip Voyd. Made in England'. Guy Adams is not, therefore, entitled to answer questions addressed to the designer of the Voyd turntable.

The original Reference turntable built by Philip Voyd has a precision bearing and a Lexan platter but has two opposing motors which more accurately realise the principle expounded by the true designer and so accurately repeated by Guy Adams.

J. F. HARE
(ONE HALF OF PHILIP VOYD),
SHEFFIELD

One half of Philip Voyd, eh? How do you become one half of a fictitious character? An explanation is required perhaps; Philip A Voyd was a lighthearted pseudonym that the more cryptically inclined might notice could be read as 'fill a void', because the designers felt that there was a void in the turntable market!

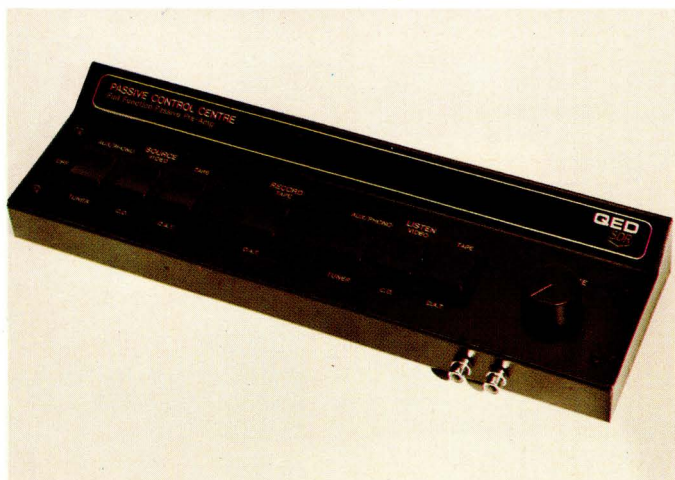
This brings us to the origin of this particular transcriber. The inspiration behind the first two-motor Voyd came from an article in the French magazine L'Audiophile printed in 1981, and the first deck was built around this time by Les Wolstenholme of Avondale Audio – it is one of these that you are referring to. The original three-motor Voyd was designed and built by Guy Adams and Guy Sargeant and first saw the light of day in 1985. All subsequent Voyd turntables have been built by Voyd Ltd which is run by Guy Adams.

BUDGET AMP

As a lowly student my purchasing power limits me to budget equipment, so bearing this in mind could you recommend an amplifier to replace the rather unimpressive JVC AX-330 that I use at present. The rest of my system is made up of a Dual CS505-3 turntable, Denon DRM-700 cassette deck and Mission 707 loudspeakers.

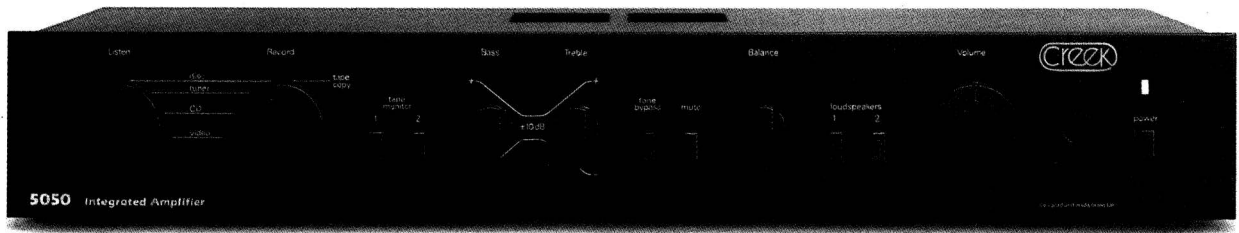
I have shortlisted the following three amplifiers: Harman/Kardon 6100, Denon PMA 320 and Arcam Delta 60. Given that I primarily listen to rock music, ie Whitesnake, Zappa etc, which of the amplifiers would give me the best performance? JASON CRAWFORD,
GLASGOW.

Of the amps you shortlist we have tested the H/K (issue 80) and the Arcam (issue 68), both being Recommended and thus definitely worth auditioning. Compatibility with your various source components will not be a problem but the match with your speakers is less predictable, in as much as the superficial presentation will probably vary slightly from amp to amp. It would therefore be wise to take your loudspeakers along to a dealer which stocks the two amps you list and have a good listen to both combinations. Try to listen at both low and high volume with a turntable as a source. Some dealers prefer using CD to demonstrate with, but the sound quality of phono stages can vary so it's a good idea to check them out.



The passive approach to CD preamplification.

Pure and simple.



Music, pure and simple.
The new 5050 stereo integrated amplifier from Creek.



Durford Mill Petersfield Hampshire GU31 5AZ Great Britain
Telephone: (073 080) 721 Telex: 86443 MS HIFI Fax: (073 080) 854

Pure and simple.



Music, pure and simple.
The new 5050 stereo integrated amplifier from Creek.



Durford Mill Petersfield Hampshire GU31 5AZ Great Britain
Telephone: (073 080) 721 Telex: 86443 MS HIFI Fax: (073 080) 854



CHOOSING AND USING . . . AMPLIFIERS

Cliché or not, the amplifier is the heart of the hi-fi system. Its purpose is to accept the different signals from the various sources, conform and order them as necessary, and then provide the power to drive and control the loudspeakers. In what is known as an integrated amplifier, the first part of this task is carried out in the preamplifier section; while the power amplifier part deals with the loudspeakers, but the whole is contained within a single box. In more costly systems these two sections are often separate units, and power supplies may also be separately cased. The tasks are quite distinct, so integration is only a matter of cost, convenience and compactness.

Twenty years ago amplifiers were mostly low powered, using Class A circuitry with valves and output transformers. Then the transistor took over rapidly, offering higher specification power, lower cost, and improved longevity. So far, so good, but the valve amplifier – like the moving coil cartridge – never quite died. And after a couple of false starts it is currently enjoying its strongest revival yet, albeit at prices which will make many readers blanche. The valve versus transistor debate is a fascinating one, though too rarefied for much of an airing in this introduction. Where cost-effectiveness is king, the transistor still rules.

The other historical trend concerns the complexity of the preamplifier section. When hi-fi had to make the best of barely adequate source quality, a complicated and flexible pre-amplifier section was a useful means of making the best of a bad job. During the Japanese invasion of the '70s, rival manufacturers vied with each other to invent and incorporate more and more extensive features: tone controls became graphic equalisers, and the often baffled user was encouraged to fantasise that he was on the bridge of the Starship Enterprise. However, improvements in sources have since started a 'simply better' backlash. Ten years ago a fledgling Naim Audio abandoned tone controls on the grounds that they degraded

sound quality. This was a major heresy at the time, but the trend is now firmly established, and even some of the Japanese manufacturers have since followed suit.

TWO MARKETS

There are now two distinct types of hi-fi amplifier. The so-called 'bells and whistles' models still exist, though they now tend to be down-rather than upmarket products. Those who appreciate the flexibility of extensive switching and tone shaping can now take advantage of the low prices which derive from highly efficient manufacture for a mass market.

However, the real hi-fi amplifier action has been towards improvements in sound quality, much of which has been due to simplifying the circuitry by eliminating as many frills as possible, and even in some cases omitting a complete gain stage through the use of the latest transistors. The ear has proved a more subtle tool than any spectrum analyser in adjusting circuit topography, simplifying earth patterns, beefing up power supplies, and selecting key passive components, all in the interests of improving sound quality.

PREAMPLIFICATION

As hi-fi amplifiers become increasingly minimalist, the pre-amp now only retains two key functions: the sorting out of the signals from the vinyl disc source, and the switching of the various inputs and outputs. Tuners, cassette decks, CD players, and what-have-you all put out more or less the same sort of signal, which is already equalised to 'flat'. Vinyl disc apart, the pre-amp then becomes little more than a glorified switch with volume and balance controls. Which explains why suchlike devices – using purely passive components and hence inherently simple – are now becoming available in the most specialist end of the market.

Vinyl disc replay is quite a different kettle of fish. The pre-amp is connected directly to the transducer itself, with no intervening electronics, and this introduces all sorts of

difficulties. Furthermore, the signal from the cartridge is very small, and requires two distinct stages of equalisation to get a 'flat' end result. To add insult to injury, there are now two popular kinds of cartridge, the high output moving magnet and low output moving coil (plus a few odd permutations), and they are different enough to need quite separate treatment. There's not even a standard for the source or input impedance of low-output cartridges.

For the future, it is quite possible we will see wider use of turntables with built-in cartridge preamps, so that each source feeds a 'flat' signal at line level to a simple switching and attenuating preamp. But now that the first digital signal source (CD) is fully accepted, with others (DAT and DBS) planned for the future, we are beginning to see a new type of preamp which accepts digital signals directly, carrying out various functions by means of an on-board microcomputer before finally converting the signal back to analogue before feeding to the power amplifier. Such a system should theoretically be immune from the signal degradation which has been leading the market towards simpler analogue amplifiers, and could lead to a revival of more complex preamps, though progress will be slow because any preamp section will need to handle conventional signals alongside digital for many years to come.

POWER AMPLIFIERS

This is the part of the amplifier whose job it is to drive the loudspeakers – and a right old job that can turn out to be. Like the cartridge, a loudspeaker is a transducer, and the task is to turn the electrical model of the music signal back into a mechanical (acoustical) signal for the benefit of the ears. The loudspeaker is a form of motor, but its task of covering the whole range of audio frequencies is mechanically almost intolerable, and there is an inevitable lack of control at various resonance points. While the amplifier provides the loudspeaker with a voltage which corresponds to the amplified music signal, it is the

characteristics of the loudspeaker itself which determines the current demand. This current demand can be very unpredictable, particularly at resonance points, which is why serious hi-fi amplifiers are usually designed with plenty of surplus current capacity, and with an eye on the stability of the voltage signal whatever the current demand.

The main measurements on amplifiers relate to power output and distortion, but more important than the maximum power output itself is the way the power is maintained into different loads, and this is analysed in the reviews. The various distortion measurements also help explore the limits of the amplifier, but paradoxically, striving for low distortion seems to prejudice sound quality.

CHOOSING

There are a number of criteria one could use when selecting an amplifier, and the most valid is probably sound quality. Despite the attention it attracts, power output comes much further down the list, because the differences between most models is not in fact that great, and measured power is by no means a reliable indicator of subjective loudness capability.

The range of facilities required should naturally be taken into account, paying particular attention to the type of cartridge being used. But it should also be borne in mind that every unused feature contributes nothing and will probably have a negative effect upon the potential sound quality. While some people seem more sensitive than others to the sound of amplifiers, both pre- and power sections are fundamental to the system as a whole, because all signals pass through them en route to the loudspeakers.

The reviews provide an excellent guide to shortlisting some of the better sounding bargains in amplifiers around. But as ever they cannot replace an individual's selection to his or her own tastes, preferably in the correct system and ideally in an 'own room' context. Once again, the conscientious specialist dealer provides a vital link.



CHOOSING AND USING . . . AMPLIFIERS

Cliché or not, the amplifier is the heart of the hi-fi system. Its purpose is to accept the different signals from the various sources, conform and order them as necessary, and then provide the power to drive and control the loudspeakers. In what is known as an integrated amplifier, the first part of this task is carried out in the preamplifier section, while the power amplifier part deals with the loudspeakers, but the whole is contained within a single box. In more costly systems these two sections are often separate units, and power supplies may also be separately cased. The tasks are quite distinct, so integration is only a matter of cost, convenience and compactness.

Twenty years ago amplifiers were mostly low powered, using Class A circuitry with valves and output transformers. Then the transistor took over rapidly, offering higher specification power, lower cost, and improved longevity. So far, so good, but the valve amplifier – like the moving coil cartridge – never quite died. And after a couple of false starts it is currently enjoying its strongest revival yet, albeit at prices which will make many readers blanche. The valve versus transistor debate is a fascinating one, though too rarefied for much of an airing in this introduction. Where cost-effectiveness is king, the transistor still rules.

The other historical trend concerns the complexity of the preamplifier section. When hi-fi had to make the best of barely adequate source quality, a complicated and flexible pre-amplifier section was a useful means of making the best of a bad job. During the Japanese invasion of the '70s, rival manufacturers vied with each other to invent and incorporate more and more extensive features: tone controls became graphic equalisers, and the often baffled user was encouraged to fantasise that he was on the bridge of the Starship Enterprise. However, improvements in sources have since started a 'simply better' backlash. Ten years ago a fledgling Naim Audio abandoned tone controls on the grounds that they degraded

sound quality. This was a major heresy at the time, but the trend is now firmly established, and even some of the Japanese manufacturers have since followed suit.

TWO MARKETS

There are now two distinct types of hi-fi amplifier. The so-called 'bells and whistles' models still exist, though they now tend to be down- rather than upmarket products. Those who appreciate the flexibility of extensive switching and tone shaping can now take advantage of the low prices which derive from highly efficient manufacture for a mass market.

However, the real hi-fi amplifier action has been towards improvements in sound quality, much of which has been due to simplifying the circuitry by eliminating as many frills as possible, and even in some cases omitting a complete gain stage through the use of the latest transistors. The ear has proved a more subtle tool than any spectrum analyser in adjusting circuit topography, simplifying earth patterns, beefing up power supplies, and selecting key passive components, all in the interests of improving sound quality.

PREAMPLIFICATION

As hi-fi amplifiers become increasingly minimalist, the pre-amp now only retains two key functions: the sorting out of the signals from the vinyl disc source, and the switching of the various inputs and outputs. Tuners, cassette decks, CD players, and what-have-you all put out more or less the same sort of signal, which is already equalised to 'flat'. Vinyl disc apart, the pre-amp then becomes little more than a glorified switch with volume and balance controls. Which explains why suchlike devices – using purely passive components and hence inherently simple – are now becoming available in the most specialist end of the market.

Vinyl disc replay is quite a different kettle of fish. The pre-amp is connected directly to the transducer itself, with no intervening electronics, and this introduces all sorts of

difficulties. Furthermore, the signal from the cartridge is very small, and requires two distinct stages of equalisation to get a 'flat' end result. To add insult to injury, there are now two popular kinds of cartridge, the high output moving magnet and low output moving coil (plus a few odd permutations), and they are different enough to need quite separate treatment. There's not even a standard for the source or input impedance of low-output cartridges.

For the future, it is quite possible we will see wider use of turntables with built-in cartridge preamps, so that each source feeds a 'flat' signal at line level to a simple switching and attenuating preamp. But now that the first digital signal source (CD) is fully accepted, with others (DAT and DBS) planned for the future, we are beginning to see a new type of preamp which accepts digital signals directly, carrying out various functions by means of an on-board microcomputer before finally converting the signal back to analogue before feeding to the power amplifier. Such a system should theoretically be immune from the signal degradation which has been leading the market towards simpler analogue amplifiers, and could lead to a revival of more complex preamps, though progress will be slow because any preamp section will need to handle conventional signals alongside digital for many years to come.

POWER AMPLIFIERS

This is the part of the amplifier whose job it is to drive the loudspeakers – and a right old job that can turn out to be. Like the cartridge, a loudspeaker is a transducer, and the task is to turn the electrical model of the music signal back into a mechanical (acoustical) signal for the benefit of the ears. The loudspeaker is a form of motor, but its task of covering the whole range of audio frequencies is mechanically almost intolerable, and there is an inevitable lack of control at various resonance points. While the amplifier provides the loudspeaker with a voltage which corresponds to the amplified music signal, it is the

characteristics of the loudspeaker itself which determines the current demand. This current demand can be very unpredictable, particularly at resonance points, which is why serious hi-fi amplifiers are usually designed with plenty of surplus current capacity, and with an eye on the stability of the voltage signal whatever the current demand.

The main measurements on amplifiers relate to power output and distortion, but more important than the maximum power output itself is the way the power is maintained into different loads, and this is analysed in the reviews. The various distortion measurements also help explore the limits of the amplifier, but paradoxically, striving for low distortion seems to prejudice sound quality.

CHOOSING

There are a number of criteria one could use when selecting an amplifier, and the most valid is probably sound quality. Despite the attention it attracts, power output comes much further down the list, because the differences between most models is not in fact that great, and measured power is by no means a reliable indicator of subjective loudness capability.

The range of facilities required should naturally be taken into account, paying particular attention to the type of cartridge being used. But it should also be borne in mind that every unused feature contributes nothing and will probably have a negative effect upon the potential sound quality. While some people seem more sensitive than others to the sound of amplifiers, both pre- and power sections are fundamental to the system as a whole, because all signals pass through them en route to the loudspeakers.

The reviews provide an excellent guide to shortlisting some of the better sounding bargains in amplifiers around. But as ever they cannot replace an individual's selection to his or her own tastes, preferably in the correct system and ideally in an 'own room' context. Once again, the conscientious specialist dealer provides a vital link.



JOIN THE CROWD

Join the crowd now going to Doug Brady HiFi. An increasing number of people are discovering that at Doug Brady HiFi you can listen in comfort to a very wide range of products from the inexpensive to the esoteric.

The staff are as pleasant as they are knowledgeable and will help you select what is right for your system and your budget.

"AT BRADY'S YOU CAN ENJOY A FAIR DEMONSTRATION OF ROKSAN VERSUS THE REST."

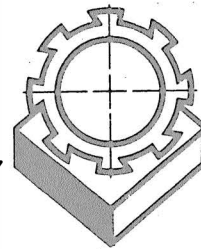


Doug Brady Hi-Fi

Kingsway Studios,
Kingsway North,
Warrington, Cheshire.
(0925) 828009.
Fax: (0925) 825773.
Open six days.

401 Smithdown Road,
Liverpool L15 3JJ,
Merseyside.
(051) 733 6859
Closed on Wednesday.

14/18 Monmouth Street,
Covent Garden,
London WC2H 9HB.
(01) 379 4010.
Fax: (01) 497 9205.
Open seven days.



ROKSAN

XERXES
ARTEMIZ
SHIRAZ

BRADY'S THE MUSICAL EXPERIENCE!



SALE
CALL IN, PHONE US,
OR FAX FOR A COPY
OF OUR JANUARY
SALE LIST.

BADA



JOIN THE CROWD

Join the crowd now going to Doug Brady HiFi. An increasing number of people are discovering that at Doug Brady HiFi you can listen in comfort to a very wide range of products from the inexpensive to the esoteric.

The staff are as pleasant as they are knowledgeable and will help you select what is right for your system and your budget.

"AT BRADY'S YOU CAN ENJOY A FAIR DEMONSTRATION OF ROKSAN VERSUS THE REST."



Doug Brady Hi-Fi

Kingsway Studios,
Kingsway North,
Warrington, Cheshire.
(0925) 828009.
Fax: (0925) 825773.
Open six days.

401 Smithdown Road,
Liverpool L15 3JJ,
Merseyside.
(051) 733 6859
Closed on Wednesday.

14/18 Monmouth Street,
Covent Garden,
London WC2H 9HB.
(01) 379 4010.
Fax: (01) 497 9205.
Open seven days.



ROKSAN

**XERXES
ARTEMIZ
SHIRAZ**

BRADY'S THE MUSICAL EXPERIENCE!



SALE
CALL IN, PHONE US,
OR FAX FOR A COPY
OF OUR JANUARY
SALE LIST.



AIWA XA-005

AIWA (UK) LTD., UNIT 5, HEATHROW SUMMIT CENTRE, SKYPORT DRIVE, WEST DRAYTON, MIDDX UB7 0LY. TEL: (01) 897 7000.



Enclosing more fresh air than a cheap pork pie, Aiwa's £130 XA-005 is unnecessarily bulky considering the limited internal heat-sinking and sparsely populated circuit board. Yet it looks purposeful enough from the outside, with a broad brushed-alloy fascia, a large plastic volume control and a bank of input push buttons. Six rather flimsy plastic keys select either of two tape decks, CD, 'aux' and tuner line sources, plus MM vinyl disc. There are also -20dB muting and direct-mode facilities, and each switch has a small red LED status indicator.

Unfortunately the input switching is not actuated remotely, close to the rear-mounted phono sockets. Instead, all the line-level and equalised phono signals must be routed from one side of the unit to the other. This will increase the chance of capacitive coupling between inputs as well as between left and right channels.

The vinyl disc stage is based around a single dual-channel op-amp with series-feedback equalisation. The line stage has two sections, both using NJM20680 integrated amplifiers. One is used for the bass, treble and balance circuitry; the other functions independently if the amp is used in 'direct' mode. Oddly enough the loudness contour may still be activated even if the amplifier is in direct mode.

The power stages use decent Toshiba A1264/C3181 bipolar transistors and are comprehensively protected by a UPC1237H IC, muting relay and an LR-type Zobel network.

In case the XA-005 is insufficiently comprehensive, a larger XA-007 version is also available, featuring higher power output, extra MC phono input and independent record-out selection.

LAB REPORT

Technically there was little to distinguish the XA-005, nevertheless it delivered a fairly competent performance. Power output increased by 1.9dB from 61W to 94W into 4ohms and dynamic headroom registered +1.1dB into 8ohms, but peak current was restricted to 9.5A by the protection IC. Channel balance was held to within 1dB over a 60dB dynamic range while noise was very low

via both line (-96dB) and disc stages (-87dB, A-wtd). Input sensitivities are par for the course too and vinyl disc headroom is an acceptable 29.8dB.

A slight shelving below 500Hz brought the vinyl disc response to -0.5dB at 20Hz, below which a steeper subsonic roll-off took effect. The phase shifts are all quite normal but the 10.5µsec rise time seems a trifle sluggish. Judicious use of feedback has kept THD to a low 0.002-0.004 per cent between 1W and two-thirds output (8ohm). The 3D plot shows mainly 2nd-order distortions but also reveals 3rd and 4th-order IMD at higher frequencies; the other 3D plot indicates some sensitivity to RF noise up to 30MHz.

SOUND QUALITY

Preferring the 'direct' option, our listeners felt the amplifier offered a big and friendly enough sound, yet also lacked control or finesse. In non-direct mode the CD sound was colder, harder and slightly smaller in scale, so the added warmth of the direct setting was welcome. Simple vocal passages were well represented as were well-miked solo instruments.

Regrettably this definition and stereo focus was compromised as the complexity of the music increased. Vocals took on a harder character and tended to shout uncomfortably rather than build up to a realistic climax. Cymbals also took on a hardened aspect and became more aggressive, spoiling the potentially sweet and very musical sound of the PDM source which we were using in our listening tests.

The MM (vinyl) input was certainly smoother and less up-front in delivery, but was no better resolved for all that. Instead, a softness in the bass contrasted with the harder and tighter sound of vocals and percussion.

CONCLUSIONS

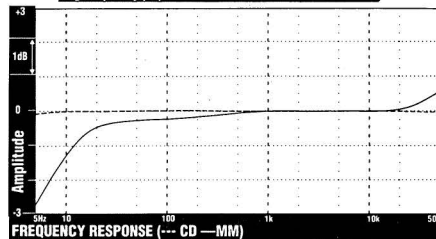
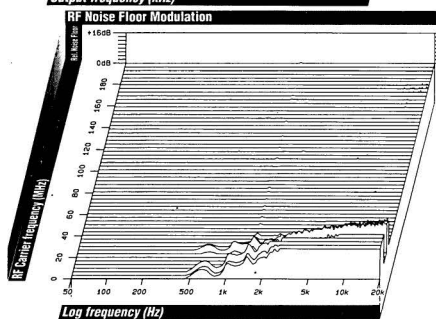
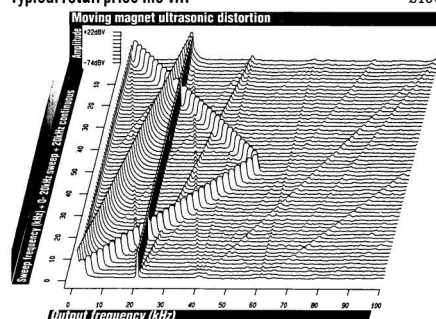
On the surface the XA-005 appears to represent fair value, but protracted listening revealed a lack of musical involvement and conviction. Although objectively competent enough, the subjective performance of the XC-005 simply failed to gel.

Still, pricing is keen and - for those who

feel they need them - the XA-005 does have a full complement of facilities.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	56.4W	60.8W	61.3W
- 4ohms	81.7W	94.1W	94.6W
Dynamic headroom (HF)			+1.10dB (78.3W)
Peak Current (5msec, 1% THD)			9.45A
Output impedance	0.162ohm	0.164ohm	0.177ohm
Damping factor	49.5	48.9	45.1
	CD/Aux	MM	MC
Stereo separation (20Hz)	69.5dB	73.5dB	
(1kHz)	68.1dB	68.8dB	
(20kHz)	42.6dB	45.8dB	
Channel balance (-20dBV)	0.38dB	0.28dB	
(-60dBV)	0.91dB	0.98dB	
Total harmonic dist. (0dBW)	-87.2dB	-87.7dB	
(½ power)	-91.8dB	-93.8dB	
CCIR intermod. dist. (0dBW)	-88.9dB	-81.6dB	
CCIR IM dist. (½ power)	-78.2dB	-79.5dB	
Phase shift (20Hz)	+14°	+14°30'	
(1kHz)	0°	-46°30'	
(20kHz)	-18°30'	-89°	
Noise (A wtd, 0dBW)	-81.8dB	-79.8dB	
(½ power)	-95.9dB	-87.2dB	
Residual noise (unwtd)	-73.9dBV	-73.8dBV	
Input sensitivity (for 0dBW)	20.2mV	329.8µV	
(for full output)	159.1mV	2.555mV	
Disc overload (20Hz)		17.23mV	
(1kHz)		154.7mV	
(20kHz)		1325mV	
(50kHz)		1743mV	
Rise time			10.5µsecs
Squarewave linearity			-104.1dB
Absolute phase			Non-inverting
Tape output/impedance			9.495V (disc)/60hm
Input loading			49.4kohm/240pF 46.2kohm/160pF
DC offset, left/right			-2.5mV/-2.1mV
Typical retail price inc VAT			£130



CAREFUL LISTENERS ONLY PLEASE



Audio Technica have built up a worldwide reputation on the quality of its transducer products ... those delicate components which turn soundwaves and mechanical movement into electrical impulses or vice versa. It's made us world leader in the field of cartridge technology and now the same micro-engineering expertise is at work in the 900 series 'phones.

The 'larger than life' sensation of our new ATH 909, ATH 910 and ATH 911 models comes courtesy of extra large diameter drivers with copper clad aluminium voice coils which produce a superbly natural sound right through to the critical high frequencies. Add good ergonomic design, soft-feel earpads plus a low overall weight to create a most impressive headphone.

Comfortable enough, you'll agree, for the most careful of listeners.

Audition the 900 Series soon at your specialist hi-fi store, local BADA member dealer or simply contact us directly for more information.

kHz 5 10 20
ATH 909 Open Back
ATH 910 Closed Back Monitor
ATH 911 Open Back PC-OCC

The only complete transducer family
● CARTRIDGE ● HEADPHONE ● MICROPHONE ● VITAL LINKS

audio-technica[®]
□ INNOVATION □ PRECISION □ INTEGRITY

Technica House, Lockwood Close, LEEDS LS11 5UU. Tel: (0532) 771441 Fax: (0532) 704836



AKAI AM-65

AKAI (UK) LTD., 12 HASLEMERE HEATHROW ESTATE, SILVER JUBILEE WAY, HOUNSLOW, MIDDLESEX. TEL: (01) 897 6388.



The introduction of so-called 'digital' amplifiers seems to have slowed of late, since Akai's new *AM-65* is the only such example in this test group. Not only is it equipped with a full set of analogue inputs for CD, tuner, VCR, MM vinyl disc and three tape sources, but it can also accept the digital output of a CD player, CD transport or DAT (digital audio tape) machine.

Digital-to-analogue conversion then takes place within the amplifier, in this case via a recent 18-bit DAC (Burr Brown *PCM58P*) and proprietary 8x oversampling filter. This RF-noisy digital circuitry is screened behind a metal plate, yet is still placed very close indeed to the sensitive vinyl disc section. The topology of this disc stage is straightforward enough – a dual-channel *5218* op-amp with series-feedback equalisation – but its performance is unlikely to be enhanced by the proximity of such high-speed circuitry. Two discrete video buffers are also incorporated for use in *A/V* systems, the extra PCB mounted some distance away.

The various digital and analogue input switching uses a series of buttons on the rugged alloy fascia; the independent record-out facility takes the form of a separate rotary control. Bass, treble and balance controls are provided as a matter of course, but may be removed from the signal path by selecting 'source direct' mode. Mono/stereo, muting and *A/B* speaker selection complete the comprehensive package.

LAB REPORT

Equipped with a large mains transformer and tightly regulated supply, the *AM-65* is a fairly 'stiff' voltage source, offering a healthy 2.3dB power increase into 4ohm. This was rigidly maintained across the 20Hz-20kHz bandwidth but (as a consequence of regulation) provides only a small (+0.3dB) dynamic headroom. Low impedance speakers should not pose a problem.

Sensitivity, noise and overload margins are all fine but the Alps volume control did suffer a mild 1.3dB channel imbalance at -60dBV. THD is low, reaching a minimum of 0.002 per cent via the CD input and 0.0028 per cent via vinyl disc. The slightly high +21° phase shift reflects the abrupt LF cut seen on

the vinyl disc RIAA equalisation plot, but otherwise the response is sufficiently flat and even.

Intermodulation was fractionally poorer via vinyl disc, the 3D plot showing a trace of 2nd harmonic distortion together with 2nd and 3rd/order IMD. RF IMD proved rather odd: an initial gross sensitivity up to 20MHz was followed by sporadic bursts of noise thereafter; any related subjective effects are indeterminate.

SOUND QUALITY

Initially auditioning this amplifier via its analogue inputs, we were greeted by an essentially inoffensive but rather smeared and indistinct sound. Individual stereo images merged rapidly once the limited soundstage was complicated by more than a few instruments or performers, drowning a once perceptible vocal image in a morass of confused sounds. The listeners felt that any sense of atmosphere or occasion in a performance was muted, reducing a highly-charged recording to a collection of related sounds – splashy at high frequencies and ambiguous at lower frequencies.

Yet the *AM-65* turned out to be a 'digital' amplifier that actually sounded better via its own on-board DACs. The presentation was now leaner but sharper in focus. Complex rhythmic detail was now clearer as the amplifier took on renewed vigour, drive and purposefulness.

Furthermore, the sound continued to open-up and become more communicative via vinyl disc (MM), individual threads of a musical performance now seeming to pull in the same direction. The presentation was punchier and more confident, while vocals took on a more realistic focus and enunciation.

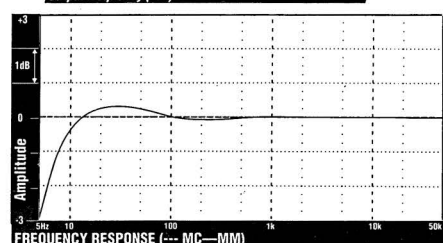
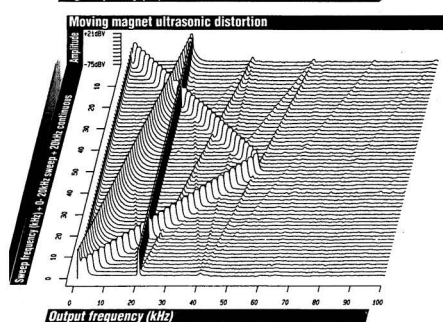
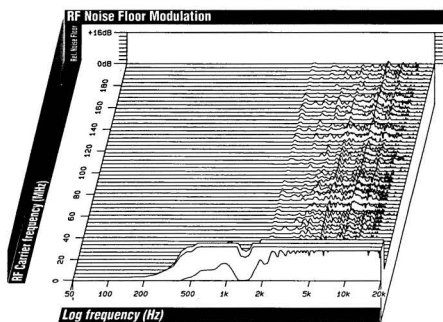
CONCLUSIONS

Well equipped, load tolerant and certainly very flexible, this very early sample sounded solid enough but simply lacks the poise and refinement of its rivals at this price point. Based purely on its sonic performance, firm recommendation is not appropriate. But if features are a high priority, the *AM-65* should certainly be auditioned.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output – 8ohms	99.2W	100.6W	99.2W
– 4ohms	174.2W	169.0W	166.4W
Dynamic headroom (IHF)		+0.31dB (107.9W)	
Peak Current (5msec, 1% THD)			17.9A
Output impedance	0.143ohm	0.143ohm	0.192ohm
Damping factor	56.0	56.0	41.6
	CD/Aux	MM	MC
Stereo separation (20Hz)	81.5dB	77.6dB	
(1kHz)	64.2dB	64.0dB	
(20kHz)	39.2dB	38.9dB	
Channel balance (-20dBV)	0.35dB	0.43dB	
(-60dBV)	1.27dB	1.28dB	
Total harmonic dist. (0dBV)	-94.1dB	-91.1dB	
(½ power)	-90.8dB	-89.6dB	
CCIR intermod. dist. (0dBV)	-99.0dB	-86.8dB	
CCIR IM dist. (½ power)	-99.1dB	-86.7dB	
Phase shift (20Hz)	0°	+21°30'	
(1kHz)	0°	-48°10'	
(20kHz)	-2°50'	-90°	
Noise (A wtd, 0dBV)	-82.5dB	-75.7dB	
(½ power)	-94.3dB	-76.2dB	
Residual noise (unwtd)	-63.2dBV	-63.2dBV	
Input sensitivity (for 0dBV)	17.35mV	291.5µV	
(for full output)	175.3mV	2.860mV	
Disc overload (20Hz)		16.33mV	
(1kHz)		162.6mV	
(20kHz)		1507mV	
(50kHz)		1953mV	
Rise time			6.1µsecs
Squarewave linearity			-103.5dB
Absolute phase			Non-inverting
Tape output/impedance		9.633V (disc)/1.42kohm	
Input loading		50.5kohm/160pF	46.8kohm/110pF
DC offset, left/right			-2.9mV/+4.9mV
Typical retail price inc VAT			£299

* The *AM-65* will not be in the shops till end March.



SOMETHING WORTH HEARING



UNSURPASSED SERVICE AND ADVICE SETS *AT LABS* APART FROM ALL OTHER STORES · AND NOW WE'VE MADE THE FINEST EQUIPMENT EVEN MORE AFFORDABLE · UNBELIEVABLE? · TO DISCOVER HOW CALL US ON

· 01-952 5535 · 173-175 STATION ROAD · EDWARE · MIDDLESEX ·
· 01-367 3132 · 159 CHASE SIDE · ENFIELD · MIDDLESEX ·
· 01-794 7848 · 190 WEST END LANE · WEST HAMPSTEAD · LONDON ·
· 01-518 0915 · 442-444 CRANBROOK ROAD · GANTS HILL · ILFORD · ESSEX ·

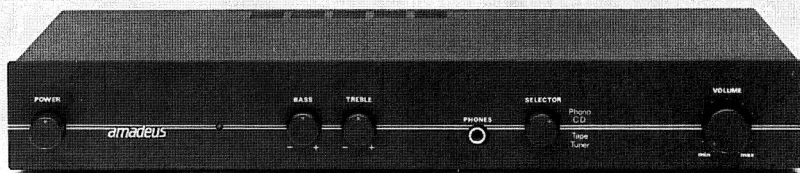


AT Labs

AMADEUS SILVER

SONDEX LTD, 4 WEST STREET, ALDERLEY EDGE, CHESHIRE SK9 7EG. TEL: (0625) 583472.

RECOMMENDED



Cheapest of the Amadeus range currently manufactured and distributed by Sondex, the *Silver* is little more than a stripped down version of the *Gold* (reviewed in September 1989). Both share a slimline case with a matt black alloy fascia and row of dainty rotary controls.

Although this *Silver* version lacks an independent record-out selector, otherwise it's equipped with the same bass and treble tone controls, with fully discrete circuitry. Input selection handles three line (labelled tape, CD and tuner) and either MM or MC vinyl disc cartridge sources. Again like the *Gold* the *Silver* uses plug-in cards to determine the loading and gain of the on-board phono stage.

A single-rail power supply feeds both pre and power sections. Although the *Silver* runs off lower voltage rails than the *Gold*, the same 15A TIP35/36C output devices are used. Unfortunately the main power output of the amplifier is routed via the headphone socket on the fascia and back out to the rear of the case using ordinary PCB track. This contributes to the series resistance between output and loudspeaker load, reducing the chances of RF instability. But it also pushes up the output impedance, reduces stereo separation, and conceivably increases any electromagnetic coupling with earlier stages in the amplifier.

LAB REPORT

Above 100Hz or so the output held up fairly well between 8 and 40hms (+1.5dB) and the +1.4dB dynamic headroom exceeded that of the Amadeus *Gold*. However, with a peak current output of just 5.5A (at a minimum 2 per cent THD on one channel and 4.5 per cent on the other), 'difficult' loudspeakers should be avoided.

Noise measured very low on the disc stages, with A-wtd figures of -87dB (MM) and -83dB (MC) relative to 1/3 output. The sensitivity is also generous at 1.1mV and 154µV respectively, even if the actual response is tailored rather peculiarly below 100Hz and above 5kHz. Disc headroom is limited to +21.2dB (MM) and +22.2dB (MC), which is insufficient in my book.

Distortion was dominated by power stage

crossover effects at low levels (typically 0.056 per cent), decreasing slightly with increasing level. The 3D plot highlights a broad carpet of 2nd-5th order mechanisms of comparable level, the difference IM products of F_{0-20k} and F_{20k} (together with its harmonics) tracking towards the left and into the audio band. These closed-loop distortions will tend to disguise the hard and brittle colorations imposed by RF IMD, depicted from 1-35MHz and 70-200MHz on the other 3D plot.

SOUND QUALITY

Much like the *Gold* reviewed in the last amplifiers issue, the *Silver* had a sweet and mellifluous sound that though faintly coloured remained potently atmospheric. The crack of percussion was both suitably hard yet undemanding on the ear, just as a hint of smearing betrayed little or no 'coldness' that might lead to fatigue.

Very low bass notes came rumbling forth but our listeners felt the upper bass/lower mid would have benefited from a little fleshing out. Better damping and control would have been welcome, but the rich, fluid and seemingly very natural sound of this amplifier proved its strongest asset.

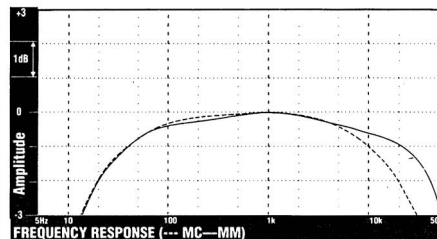
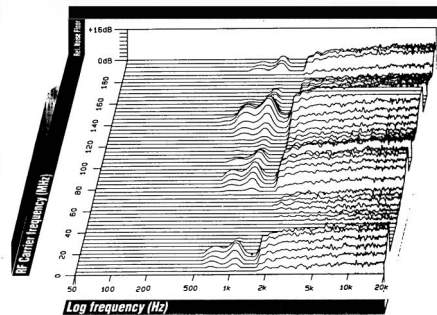
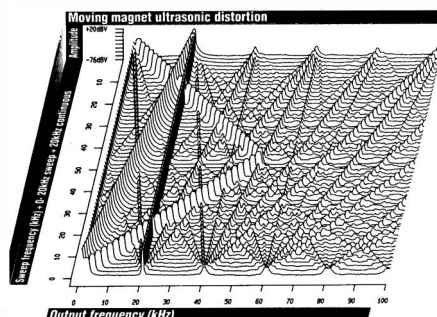
These positive qualities were even more obvious when auditioning the vinyl disc input. Here the sound was slightly more open, spacious, delightfully fluid and tonally integrated. Low bass still showed fair accuracy but the residual softness or overhang in the upper bass remained. Strings were richened - very beguiling and emotionally convincing but not wholly accurate in the technical sense. However, in the final analysis any mild divergence from absolute neutrality can be forgiven as long as the result is still musically rewarding!

CONCLUSIONS

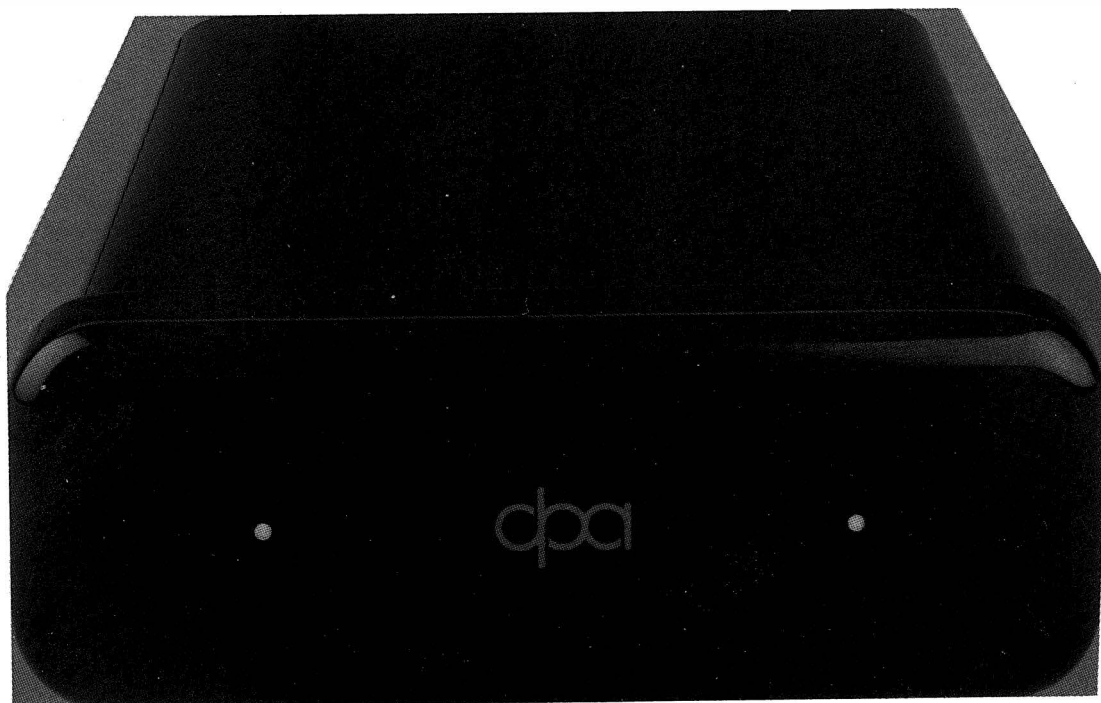
By offering a similarly lush sound quality and greater stability at a lower cost, the Amadeus *Silver* clearly represents better value than its *Gold* stablemate. There are many aspects of the circuit design which could certainly be tidied up to further improve audio performance, but the *Silver* nevertheless merits Recommendation.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	32.1W	37.4W	35.7W
- 4ohms	37.8W	53.3W	52.0W
Dynamic headroom (HF)		+ 1.36dB	(51.2W)
Peak Current (5msec, 1% THD)			5.5A*
Output impedance	0.865ohm	0.884ohm	0.923ohm
Damping factor	9.25	9.05	8.67
	CD/Aux	MM	MC
Stereo separation (20Hz)	52.5dB	66.7dB	65.0dB
(1kHz)	50.7dB	61.1dB	60.7dB
(20kHz)	49.9dB	34.1dB	32.8dB
Channel balance (-20dBV)	0.06dB	1.21dB	1.35dB
(-60dBV)	0.66dB	1.75dB	1.92dB
Total harmonic dist. (0dBW)	-63.7dB	-65.8dB	-64.9dB
(1/3 power)	-60.3dB	-71.5dB	-69.5dB
CCIR intermod. dist. (0dBW)	-62.3dB	-63.6dB	-54.3dB
CCIR IM dist. (1/3 power)	-60.3dB	-60.2dB	-53.7dB
Phase shift (20Hz)	+30°30'	+36°30'	+35°
(1kHz)	0°	-47°30'	-48°30'
(20kHz)	-18°	-115°	-126°30'
Noise (A wtd, 0dBW)	-79.8dB	-79.7dB	-79.1dB
(1/3 power)	-90.7dB	-86.5dB	-82.8dB
Residual noise (unwtd)	-57.9dBV	-57.8dBV	-57.7dBV
Input sensitivity (for 0dBW)	31.25mV	174.5µV	24.3µV
(for full output)	193.9mV	1.063mV	153.9µV
Disc overload (20Hz)		7.875mV	1.06mV
(1kHz)		57.68mV	6.45mV
(20kHz)		415.7mV	51.8mV
(50kHz)		402.7mV	49.8mV
Rise time			5.1µsecs
Squarewave linearity			-73.9dB
Absolute phase			Inverting
Tape output/impedance		7.49V (disc)/44.7ohm	
Input loading	17.8kohm/65pF	47.5kohm/130pF	335ohm/21nF
DC offset, left/right			-0.8mV/-0.5mV
Typical retail price inc VAT			£270



A bit of a change.....

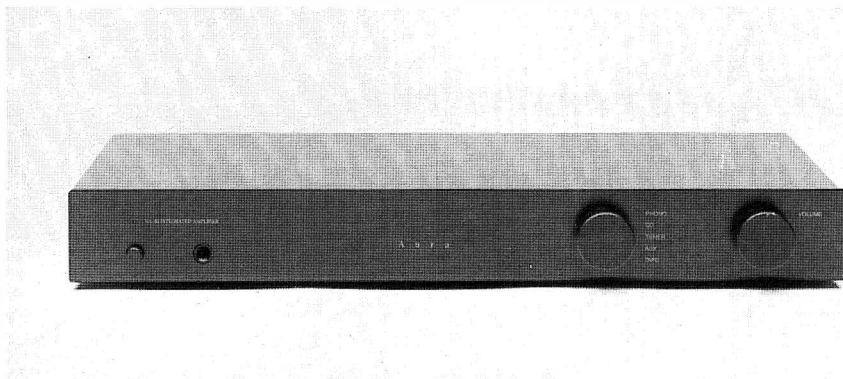


**... the PDM ONE bit stream
digital to audio convertor.**

Deltec Precision Audio Ltd, Unit 7, East Moors Business Park,
East Moors Road, Cardiff, South Wales, CF1 5EE, United Kingdom
Tel:(0222) 482818 Fax: (0222) 497522

AURA VA-40

B&W LOUDSPEAKERS LTD., MARLBOROUGH RD., CHURCHILL IND. EST., LANCING, W. SUSSEX. TEL: (0903) 750750.



Major British loudspeaker manufacturer B&W has apparently been looking to expand into the electronics field for some time, and therefore seized a recent opportunity to absorb nearby newcomers ITL. Renamed Aura Designs Ltd but employing key ITL personnel, the first product is this slimline integrated amplifier.

The £189 VA-40 is based substantially on ITL's earlier MA80, itself a variation on the Hitachi MOSFET applications circuit. Visually the two amplifiers are almost identical with two black alloy controls for volume and input selection together, plus a handy headphone socket that mutes the optional switched speaker outlets.

Four line sources may be connected, but the MA80's 'giveaway' MC headamp has been discarded in favour of a straightforward MM-only vinyl disc input. The output power has also been bolstered from 40W to 55W, but then so has the price up £40 from £150 to £190.

Internal construction is very neat and tidy, though heatsinking for the Hitachi 2SK1057/2SJ161 power FETs could be more generous. In fact the underside of the VA-40 gets extremely warm when pushed beyond 5-10W continuous, so adequate ventilation is essential.

The main (higher voltage) power supply no longer uses Rubycon electrolytics, but the MM vinyl disc stage is still based around two 5532 op-amps with shunt-feedback for RIAA tailoring. However, these are now Far Eastern RC5532s which are subjectively inferior to those used in an original sample of the MA80 in my opinion.

LAB REPORT

Compared to the older MA80, Aura has updated the continuous and dynamic output of the VA-40 effectively enough, but its 9.8A peak current capability is exceeded by other, similarly specified amps in this survey. The VA-40 has slightly lower THD than its ancestor (from 0.018 to 0.0056 per cent at 1W), but there is still an appreciable distortion increase with level, frequency and reducing load impedance.

This is clear from the 3D plot, which shows strong 2nd, 3rd and 4th-order IM distortions

tracking directly into the audio band. Those related to $yF_{20k} - xF_{0-20k}$ [$y = 1,2,3$ and $x = 1,2,3,4$] are most obvious and stem from the MOSFET output stage rather than the vinyl disc eq network. Demodulation of AM/RF noise also occurs at 80MHz, 125MHz and 150MHz, though the maximum 6dB increase in audible 5-20kHz noise is likely to be masked by the closed-loop distortions.

Noise and overload margins are both improved over the MA80, but stereo separation has deteriorated from 45dB to 37dB at 20kHz. The ± 0.3 dB 'wobble' in the disc response at 150Hz and 20Hz is a characteristic of both amplifiers.

SOUND QUALITY

The VA-40 was neither as dynamic nor as forward as some of the other specialist integrated amps in this test. Instead it has a gentler and marginally less enticing sound. Strong CD percussive sequences sounded slightly withdrawn, the edge missing from their impetus and attack. At the same time, vocals sounded very smooth and articulate with no trace of acid sibilance – a reasonable trade-off I would think.

Unfortunately our listeners felt that the very transparent PDM digital source was somewhat clouded. The VA-40 demonstrated a fair sense of stereo depth, but was rather flat or 'dead' in the frontal plane.

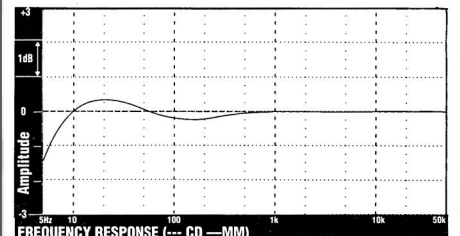
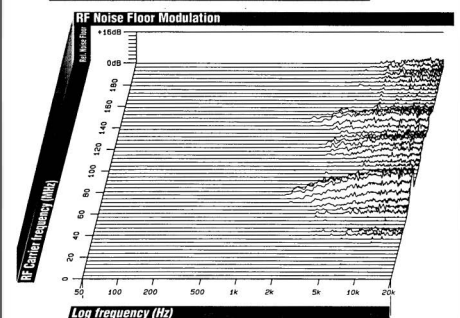
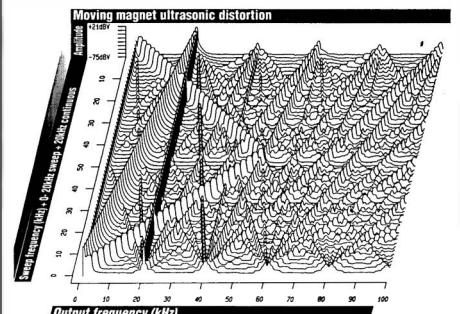
The MM vinyl disc input seemed to offer a slightly sharper and more tactile sound, with the crack of percussion now more accurately represented. Deep bass was still a little lacking and the mid remained clouded, but again strong vocals always managed to break through the veil in a pleasingly articulate fashion. However, regardless of the input chosen, this amplifier did show a certain signature – a character that tended to stifle the raw energy of the music.

CONCLUSIONS

Smooth and relaxing rather than up-beat and intimately detailed, the VA-40 remains unlikely to offend. Nevertheless the subtle distinctions between the ITL MA80 and newer Aura VA-40 suggest the latter has lost a little of the sparkle and vividness that was enjoyed in the original version.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output – 8ohms	54.4W	54.5W	54.1W
– 4ohms	66.4W	67.5W	66.3W
Dynamic headroom (IHF)		+ 1.56dB	(78.1W)
Peak Current (5msec, 1% THD)			9.8A
Output impedance	0.039ohm	0.049ohm	0.069ohm
Damping factor	200.5	162.7	114.4
	CD/Aux	MM	MC
Stereo separation (20Hz)	95.2dB	88.3dB	
(1kHz)	64.5dB	64.2dB	
(20kHz)	37.4dB	37.4dB	
Channel balance (–20dBV)	0.34dB	0.52dB	
(–60dBV)	0.03dB	0.23dB	
Total harmonic dist. (0dBV)	–85.2dB	–85.0dB	
(½ power)	–74.9dB	–75.2dB	
CCIR intermod. dist. (0dBV)	–81.6dB	–78.1dB	
CCIR IM dist. (½ power)	–76.3dB	–77.6dB	
Phase shift (20Hz)	+1°40'	+18°	
(1kHz)	0°	–49°30'	
(20kHz)	–9°30'	–90°	
Noise (A wtd, 0dBV)	–78.6dB	–77.2dB	
(½ power)	–89.9dB	–83.4dB	
Residual noise (unwtd)	–62.0dBV	–62.0dBV	
Input sensitivity (for 0dBV)	30.0mV	435.4µV	
(for full output)	223.9mV	3.234mV	
Disc overload (20Hz)		12.48mV	
(1kHz)		117.2mV	
(20kHz)		976.1mV	
(50kHz)		1064mV	
Rise time			2.5µsecs
Squarewave linearity			–89.3dB
Absolute phase			Non-inverting
Tape output/impedance		8.10V (disc)/98.9ohm	
Input loading		94kohm/45pF	47kohm/110pF
DC offset, left/right		+39.7mV/	+52.6mV
Typical retail price inc VAT			£189



Uxbridge Audio

Dear Sir

Wembley Park,
Middlesex.

The EXCELLENT service, personal attention and professionalism I found with your staff, compels me to write this letter.

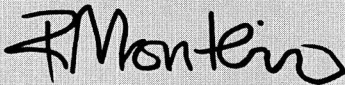
Having embarked on the daunting task of looking for the right music system I visited many Stores and purchased a lot of literature. I was attracted by your advertisement in What Hi-fi magazine. First class sound quality was my top priority and from another article in the same magazine I had made up my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

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

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

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

Wishing your Company every success



Mrs. F. Monteiro

Uxbridge Audio
278 High Street, Uxbridge
Middlesex. Tel: 0895-30404 multi-line
Open 10am till 6pm - 6 days a week

*Music from the best
equipment at all
price levels*

TWO DEMONSTRATION ROOMS • 7 DAY EQUIPMENT EXCHANGE
OR REFUND • UNBIASED ADVICE • MAIL ORDER ANYWHERE
2 YEARS GUARANTEE PARTS AND LABOUR • FULL INSTALLATION
SERVICE • 0% INTEREST FREE CREDIT • FULL SERVICE &
TURNTABLE SET UP FACILITIES



ACUSTIC ENERGY • A&R CAMBRIDGE • AR • ARISTON • AUDIOLAB • AUDIOTECH • CAMBRIDGE AUDIO • CREEK • CYRUS • DENON • DUAL • EPOS • EXPOSURE • HEYBROOK

ION OBELISK • JPW • KEF • LINN PRODUCTS • MARANTZ • MERIDIAN • MICHELL • MISSION • MONITOR AUDIO • NAD • NAIM • NAKAMICHI • QED • QUAD

REVOLVER • REVOX • ROGERS • ROKSAN • ROTEL • ROYD • RUARK • STAX • TANNY • THORENS • WHARFEDALE • YAMAHA

BADA
THE ULTIMATE IN
SOUND ADVICE

CREEK CAS-4140 S2

M. R. CREEK LTD., DURFORD MILL, PETERSFIELD, HANTS GU31 5AZ. TEL: (0730) 80721.

RECOMMENDED



Although the *CAS-4140 Series 2* was reviewed in an earlier *Amplifiers* issue of *Choice*, subtle running production changes make a second visit worthwhile. Now produced by Mordaunt-Short under the TGI Group umbrella, the *CAS-4140* represents an audiophile version of the cheaper *CAS-4040*. Gone are bass and treble tone controls, to be replaced by a more sophisticated two-stage phono amplifier with additional MC input. Three line sources are available via a row of pushbuttons located on the far left of the matt black fascia, while the MM or MC cartridge option must be selected using an internal switch.

In MC mode the low-level input is routed through a discrete single-transistor headamp prior to feeding the MM/RIAA stage. *NE5532N* op-amps are used both for gain and (with series-feedback) for the LF arm of the disc eq network. A further *NE5532* is used in the line stage but is replaced by a slightly noisier *TLO72* in the tape buffer.

A chunky 160VA toroid and 2 x 10,000µF electrolytics constitute the power supply, supporting Creek's Class A driver stage and *TIP35/36* output devices, the latter mounted on a small rear-facing heatsink. Adequate ventilation is a must, particularly as the vinyl-covered Medite cover does very little to conduct away heat. Full DC offset and overload protection is provided via both the direct and switched (headphone) speaker outlets.

LAB REPORT

Just scraping in at 40W per channel the *4140 S2*'s 13.9A peak current rating implies that difficult speakers will be handled with ease. The huge (10-11dB) channel balance error at -60dBV is not all that clever, but output impedance, noise, input sensitivities, loading and disc eq accuracy are all fine.

Hawk-eyed readers may have spotted the high levels of THD suffered by both vinyl disc inputs (18.8 and 29.2 per cent respectively), whereas the line input offers a low 0.022 per cent. This is directly linked to the very limited headroom available to the MC headamp (+9.4dB) and later MM gain stage (+15dB), the paltry 28mV margin exceeded by the 50mV input level used for the MM THD

tests. Higher output MM/MC cartridges may tend to cause clipping in this stage under transient conditions.

Since the composite input level for the 3D Ultrasonic distortion plot is at a lower 20mV, the spray of harmonic and IM distortions depicted are strictly a function of the power amp stages. The accompanying RF IMD plot shows the *CAS-4140* is sensitive to RF noise in the 130-145MHz region - a function of the input RC network.

SOUND QUALITY

Following hard on the heels of the *CAS-5150* reviewed in our last amplifier issue, the *4140* offered a more balanced perspective between line and disc inputs. Whereas the *5150* was certainly preferred via vinyl disc, the *4140* sounded equally sharp and tactile through all inputs.

This implies that the integral power amp dominates the 'character' of the sound - indeed both MM and CD inputs were tinged with a hint of brightness. It's as if a spotlight of interest was trained on the upper ranges of vocals, strings and percussion, all of which could sound a little hard, urgent and unforgiving at times. Nevertheless, the *4140* had a fair stab at revealing the openness and exceptional detail resolution of the PDM digital converter which we were using in this month's listening tests to assess the transparency of amplifiers' CD inputs. There was no cloudiness about the sound, simply a slight edginess in the treble, particularly when it was pushed hard.

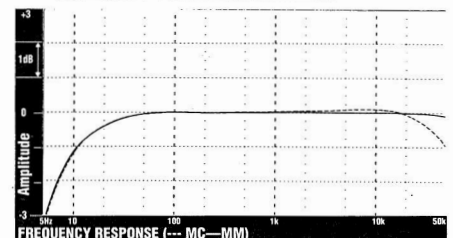
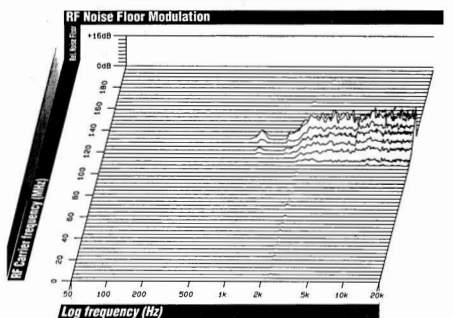
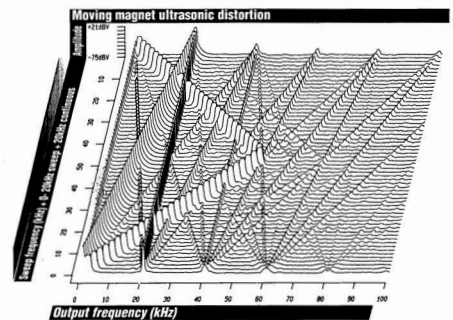
Used with sweeter-sounding and more sensitive speakers the *CAS-4140* would undoubtedly sing, for its ability to retrieve fragile musical details is a rare bonus at this price.

CONCLUSIONS

The aesthetics of this amplifier are still a trifle drab, but a little care in matching this amp with speaker and CD player will prove worthwhile. Although not universally applicable, it is genuinely capable of producing a lively, detailed and musically satisfying sound. Recommended, but with the proviso that Creek gets to grips with the restricted disc headroom.

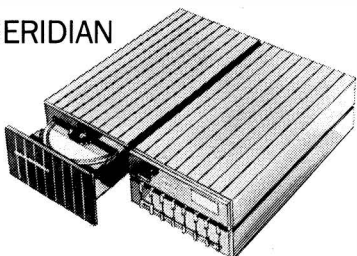
TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	39.1W	40.0W	37.8W
- 4ohms	58.9W	68.1W	61.6W
Dynamic headroom (1HF)			+0.89dB (49.1W)
Peak Current (5msec, 1% THD)			13.9A
Output impedance	0.026ohm	0.028ohm	0.044ohm
Damping factor	306.9	290.1	182.4
Stereo separation (20Hz)	86.8dB	73.1dB	61.6dB
(1kHz)	53.9dB	76.3dB	61.7dB
(20kHz)	29.6dB	57.9dB	66.1dB
Channel balance (-20dBV)	0.34dB	0.40dB	0.51dB
(-60dBV)	10.4dB	10.7dB	10.5dB
Total harmonic dist. (0dBW)	-73.3dB	-14.5dB*	-10.7dB*
(½ power)	-72.3dB	-14.5dB*	-10.7dB*
CCIR intermod. dist. (0dBW)	-76.0dB	-75.5dB	-26.6dB*
CCIR IM dist. (½ power)	-78.6dB	-75.6dB	-26.5dB*
Phase shift (20Hz)	+16°	0°	0°
(1kHz)	0°	-48°10'	-45°
(20kHz)	-30°30'	-102°10'	-93°40'
Noise (A wtd, 0dBW)	-82.7dB	-76.2dB	-73.1dB
(½ power)	-94.2dB	-78.6dB	-74.7dB
Residual noise (unwtd)	-61.6dBV	-61.0dBV	-60.8dBV
Input sensitivity (for 0dBW)	27.5mV	371.5µV	22.5µV
(for full output)	175.1mV	2.374mV	142.1µV
Disc overload (20Hz)		3.21mV	189.5µV
(1kHz)		28.09mV	1.47mV
(20kHz)		262.6mV	9.28mV
(50kHz)		589.5mV	10.18mV
Rise time			8.4µsecs
Squarewave linearity			-104.5dB
Absolute phase			Non-inverting
Tape output/impedance			8.877V (disc)/92ohm
Input loading	32kohm/100pF	49kohm/200pF	115ohm/300pF
DC offset, left/right			-23.4mV/-19.1mV
Typical retail price inc VAT			£219



It's a pleasure to talk to a good listener.

MERIDIAN



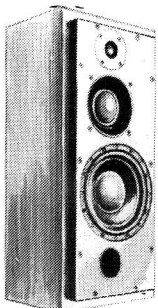
Is the new 208 CD player as good as the reviews say? — how does the 206 compare? — should I go 'bitstream'? The answers to all these questions and many more are all available at Acoustic Arts. Why not come along and hear for yourself.

LINX



The Nebula is possibly the best integrated amp at the price — the Theta tuner is definitely the best sounding tuner at the price and we now have the new Vega pre and power amp combination which continues the excellent run of new products. Please arrange for an early audition — we guarantee you won't be disappointed.

ATC



Just about every major studio in the world, a lot of major artists and now the illustrious BBC use this company's loudspeakers for serious reference listening — so why don't you? A marvellous range of active and passive monitors of truly outstanding performance.

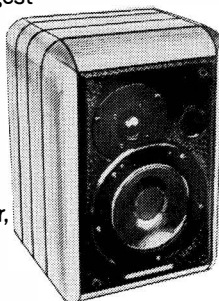
DENON



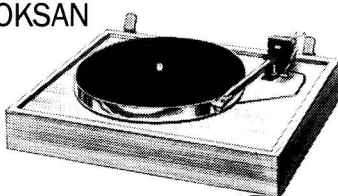
We are North London's biggest dealer for this superb range of equipment and usually have most models in stock for immediate delivery.

ABSOLUTE SOUNDS

One of the biggest suppliers in the country for the best range of 'high end' equipment that money can buy. Apogee, Audio Research, Krell, Magneplanar, Martin Logan, Sonus Faber, etc. — They are all here on dem!

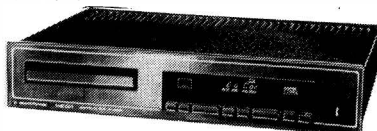


ROKSAN



What is now generally considered to be the best mid-priced turntable on the market is now even better. The new power supply significantly improves all aspects of performance and you must hear one if you are interested in rejuvenating your analogue collection. We now have the new TABRIZ arm on dem.

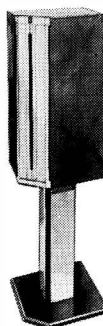
RADFORD



We are the main London agents for this company who make a superb and well known range of valve amps and pre-amps. What you may not know is they make one of the best CD players we have ever heard and an absolute bargain at just under £1000.

CELESTION

The new SL3000, 5000 and 7000 ribbon loudspeakers from Celestion are creating quite a stir. A true 'state of the art' performance at an affordable price. We very strongly recommend an early audition of these standard setting loudspeakers.

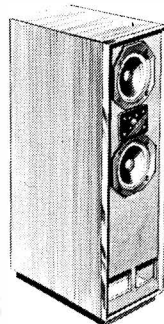


WADIA

We have on dem one of the most flexible and exciting new DA convertors available. To prove the flexibility of this computer mainframe we can demonstrate four different levels of sound quality from one unit, i.e. the 'DIGIMASTER' or 'FRENCH CURVE' software with either 16 or 64 times oversampling. In the latter mode this unit has the processing capability of over 70 IBM personal computers. If you require proof of the sonic excellence then read the current reviews in 'Stereophile' and 'TAS'.

TDL

The transmission line specialists continue to delight everyone who comes to hear them. Sales of the new Studio 1 are running at an all time high so you may be missing out if you don't come and audition them.



NEW PRODUCTS



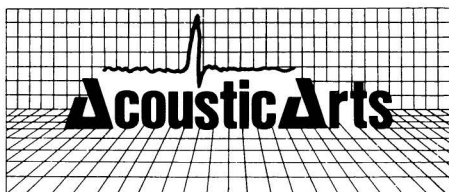
We are the first UK dealer for the amazing Solen Tigre integrated amp from France. A most fascinating hybrid design using valves and mosfets which has unbelievable sound quality for its size and price. It costs £870 plus extra for an outboard phono stage and sounds divine. Real high end sound in a small package!

We are also the first UK dealer for the American Graham inipivot arm. A true 'state of the art' tone arm which is the best we have heard outside the exotic parallel tracking arms like Air Tangent. A really outstanding product beautifully made and finished and a gem to set up.

Among the equipment we stock and love:

A&R, ATC, Acoustic Energy, Air Tangent, Alexander, Alphason, Apogee, Aragon, Audiolab, Audio Research, Celestion, Counterpoint, Denon, Dual, Ensemble, Goldmund, Heco, Heybrook, Jadis, Koetsu, Krell, Linx, Magneplanar, Manticore, Marantz, Martin-Logan, Meridian, Micromega, Monitor Audio, Musical Fidelity, Oxford, Pink Triangle, PS Audio, Quad, Radford, Revox, Rogers, Roksan, Rotel SD Acoustics, SME, Solen, Sonus Fabus, Spondor, Stax, Sumo, Systemdek, TDL, Tannoy, Thorens, VDH, WTA, Wadia, Wharfedale, Yamaha.

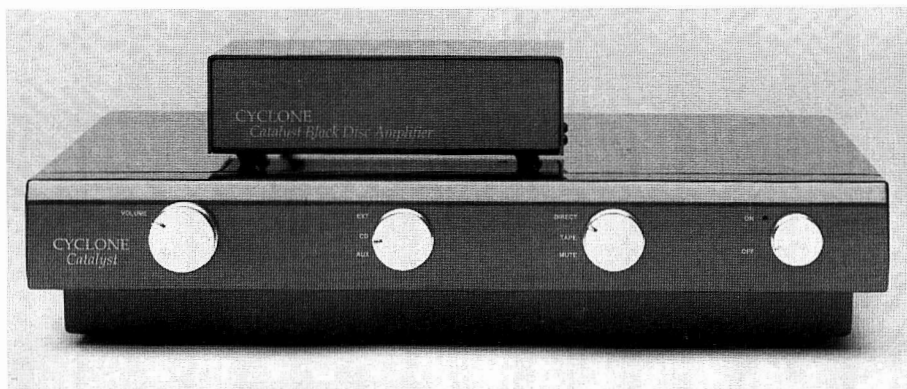
Acoustic Arts Limited, 101 St. Albans Road, Watford, Herts.
Telephone: Watford 245250 Fax. No. 0923 30798
Open Monday-Saturday 9.30-5.30 p.m.



CYCLONE CATALYST

CYCLONE SYSTEM LTD., 185 EBBERNS ROAD, HEMEL HEMPSTEAD, HERTS HP3 9RD. TEL: (0442) 54110.

RECOMMENDED



As its name might suggest, Cyclone has emerged from nowhere with a blockbuster of an amplifier. The *Catalyst* is a line-level only integrated amplifier costing some £1,995.

Additional MM and MC vinyl disc eq headamps known as Black Disc Amplifiers (BDA) are optional extras at £150 and £175 respectively, this small box matching the polished slate-grey finish of the main amplifier to which it is linked using a 25-pin D-type connector. This phono stage is then selected as 'ext' on the front panel, alongside the CD, aux and tape inputs.

Three other gold-anodised knobs cater for power, volume and mode (direct, tape or mute) while both switched and hard-wired speaker outlets are provided at the rear. A further expansion port is fitted to accommodate future input and bi-amping options.

The overall design, build and finish is fully commensurate with the price. For instance, a superior 500VA Avel-Lindburg toroid is used, alongside 4x10,000µF reservoir capacitors and extremely tight regulation. Polypropylene caps are used in the feedback network of the BDA unit, which incorporates bipolar and FET Linear Technology op-amps, the latter in the form of a unity-gain output buffer.

All input switching is achieved using sealed relays (with gold-palladium contacts), feeding a wholly symmetrical double-differential input stage and Class A driver network. The output stage is pure complementary using massive 30A MJ11015/11016 Darlingtons from Motorola; the stuff of dreams...

LAB REPORT

The exceptional supply regulation is manifest in the near-perfect +2.8dB power rise from 8 to 4ohms and huge 21A peak current delivery, alongside a concomitantly restricted +0.4dB dynamic headroom. Channel balance deteriorated with a 5-15dB error below -50dBV, while the MM input is a little insensitive at 6.4mV for full output. However, noise, headroom, phase shift and THD (typically 0.0056-0.0025 per cent) were all fine. The MM vinyl disc response is sensibly tailored below 100Hz, reaching -3dB at 15Hz.

Cyclone's use of symmetrical gain stages with cascode-followers undoubtedly contributes to superb insensitivity to RF IMD - an excellent result. The main bugbear concerns closed-loop IMD, which reaches -65dB via both line and disc stages. The 3D plot shows a consistent spray of mainly 2nd-order IM products. These are innocuous enough, yet above 15kHz or so the amplifier becomes markedly less linear. Witness the sudden emergence of high-order IM products at the top of the audio range.

SOUND QUALITY

The quality of this amplifier was immediately apparent. The sound was very refined and precise in delivery, but never intrusive or clinical. CDs sounded lush, warm and inviting, one listener commenting that it combined the attractiveness of a valve amp with the speed, solidity and sharp stereo focus of good transistor designs.

However, the *Cyclone* was not quite beyond reproach. Although it offered a beautifully correct sound it did fail to grasp the full emotive qualities of our PDM digital source. Yet by all accounts its musical conviction was faultless; voices were exquisitely realistic and bass supremely tight.

These traits were maintained by the disc input which offered a very dry, very controlled but certainly not soulless sound. However, there was also a trace of extra brittleness, a slight tinge at the very top end that exaggerated the crack of percussion and the ricochet of strings.

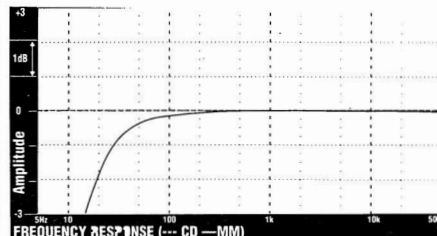
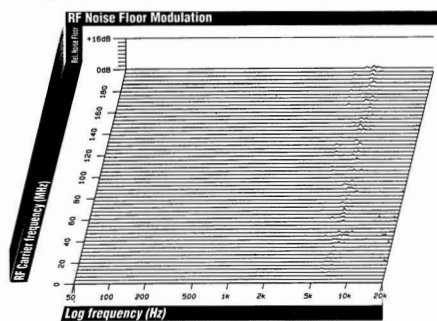
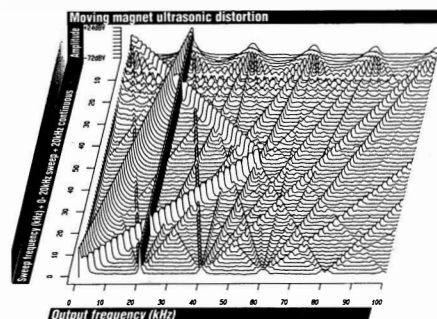
CONCLUSIONS

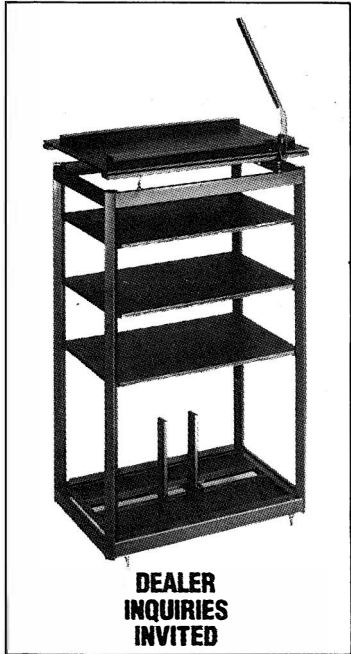
Given a favourable commercial wind the *Cyclone Catalyst* may be destined to become a classic. It is certainly one of the most painstakingly and exquisitely engineered amplifiers it has ever been my pleasure to review. Cyclone needs to look a little closer at the channel balance errors and intermodulation distortion, but as a remarkably load-tolerant and 'unflappable' amplifier it is almost without peer.

Which only leaves us wondering how many people will be willing to pay £2,000 for an integrated amplifier. Still, if you can afford this sort of outlay...

TEST RESULTS

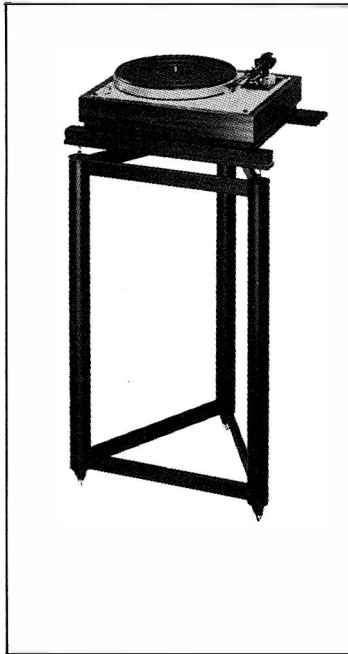
	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	73.6W	73.9W	72.1W
- 4ohms	138.7W	139.2W	135.7W
Dynamic headroom (IHF)	+ 0.37dB (80.5W)		
Peak Current (5msec, 1% THD)	21.1A		
Output impedance	0.023ohm	0.024ohm	0.018ohm
Damping factor	346.6	338.4	457.8
	CD/Aux	MM	MC
Stereo separation (20Hz)	99.9dB	98.6dB	
(1kHz)	79.6dB	79.2dB	
(20kHz)	56.0dB	55.6dB	
Channel balance (-20dBV)	0.12dB	0.02dB	
(-60dBV)	15.7dB	9.98dB	
Total harmonic dist. (0dBW)	-92.3dB	-91.5dB	
(½ power)	-86.4dB	-85.1dB	
CCIR intermod. dist. (0dBW)	-77.2dB	-73.8dB	
CCIR IM dist. (½ power)	-65.8dB	-65.5dB	
Phase shift (20Hz)	0°	+5°30'	
(1kHz)	0°	-50°30'	
(20kHz)	-11°15'	-95°30'	
Noise (A wtd, 0dBW)	-75.3dB	-72.8dB	
(½ power)	-95.7dB	-82.0dB	
Residual noise (unwtd)	-62.5dBV	-62.4dBV	
Input sensitivity (for 0dBW)	46.85mV	738.5µV	
(for full output)	407.4mV	6.386mV	
Disc overload (20Hz)		22.71mV	
(1kHz)		154.1mV	
(20kHz)		172.1mV	
(50kHz)		161.5mV	
Rise time			3.9µsecs
Squarewave linearity			-89.1dB
Absolute phase			Non-inverting
Tape output/impedance		9.81V (disc)/153ohm	
Input loading		97kohm/210pF	36kohm/—pF
DC offset, left/right		+19.5mV/+21.9mV	
Typical retail price inc VAT			£1,995



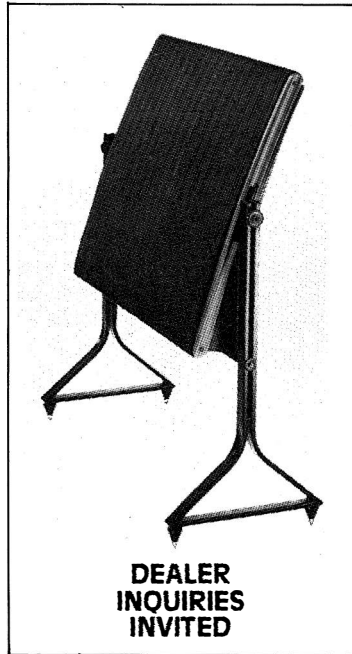


**DEALER
INQUIRIES
INVITED**

Superstructure component rack system.



The legendary lead balloon turntable isolation stand.



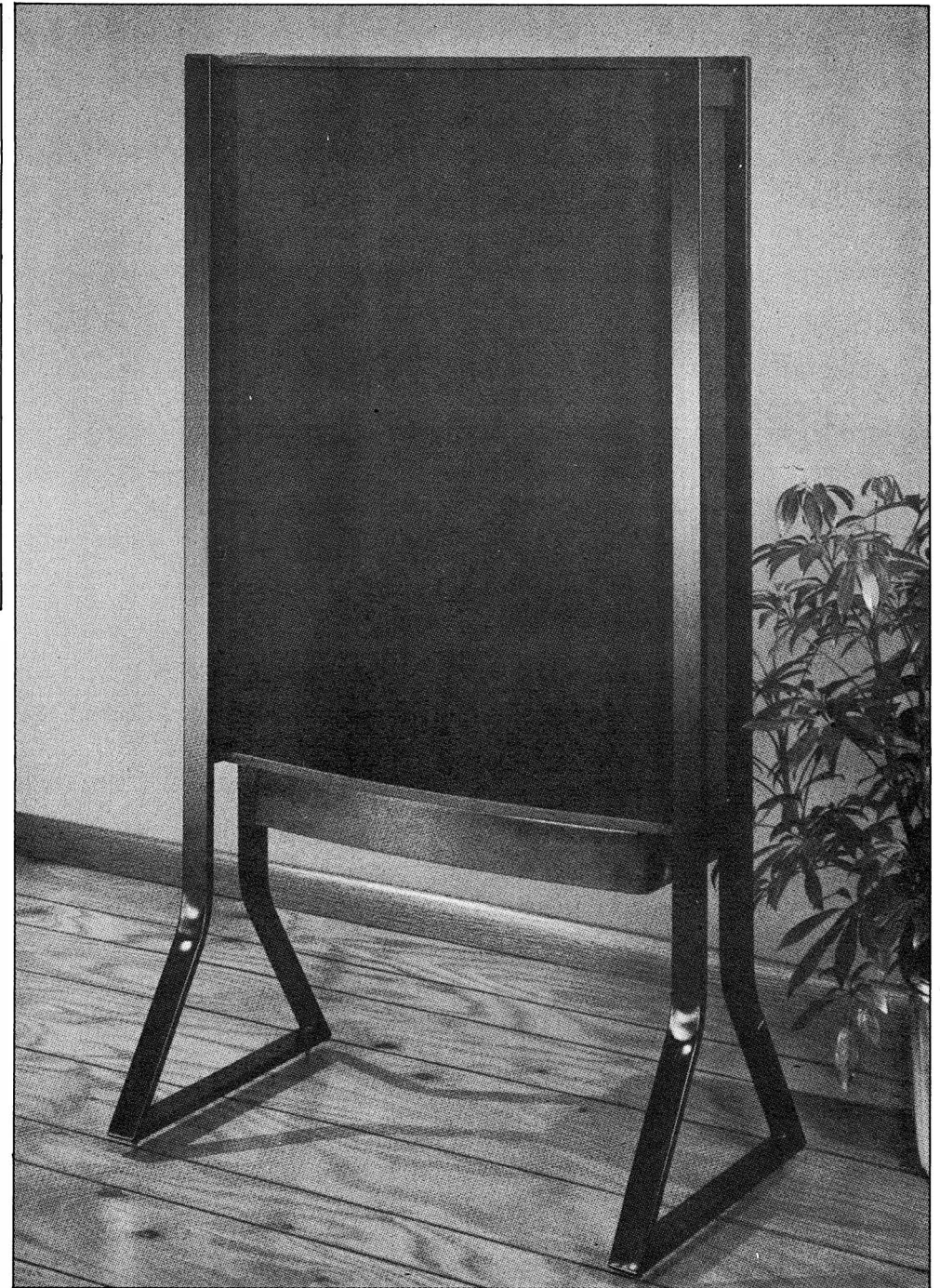
**DEALER
INQUIRIES
INVITED**

The Q-Z Quad stand for the original (classic) Quad Electrostatics

The Quad Stand *by Arcici, Inc.* (U.S.A.)

The Quad Stand by Arcici is the only commercially available stand for the Quad ESL-63 which works *with* the construction of the Quad instead of against it. The Arcici Stand clamps firmly to the upright channels that make up the sides of the ESL-63. It becomes an integral part of the loudspeaker giving the whole assembly rigidity and stability that, up 'til now, has been unattainable.

IMPORTED BY AND DISTRIBUTED IN THE U.K. BY ELECTROACTIVITY,
SHAMINT LIMITED, 11 MUSWELL AVENUE, LONDON N10 2EB. TELEFAX: 01-365 3614

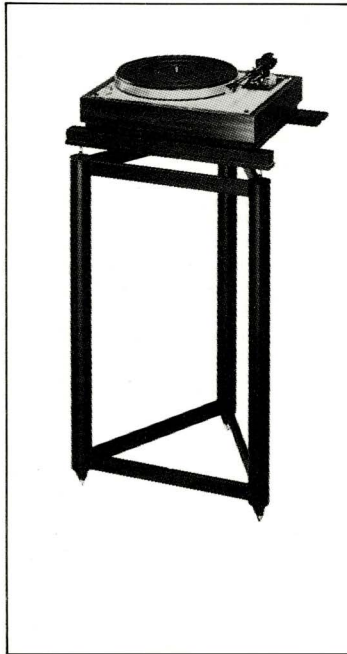


The Quad stand by Arcici.



**DEALER
INQUIRIES
INVITED**

Superstructure component rack system.



The legendary lead balloon turntable isolation stand.



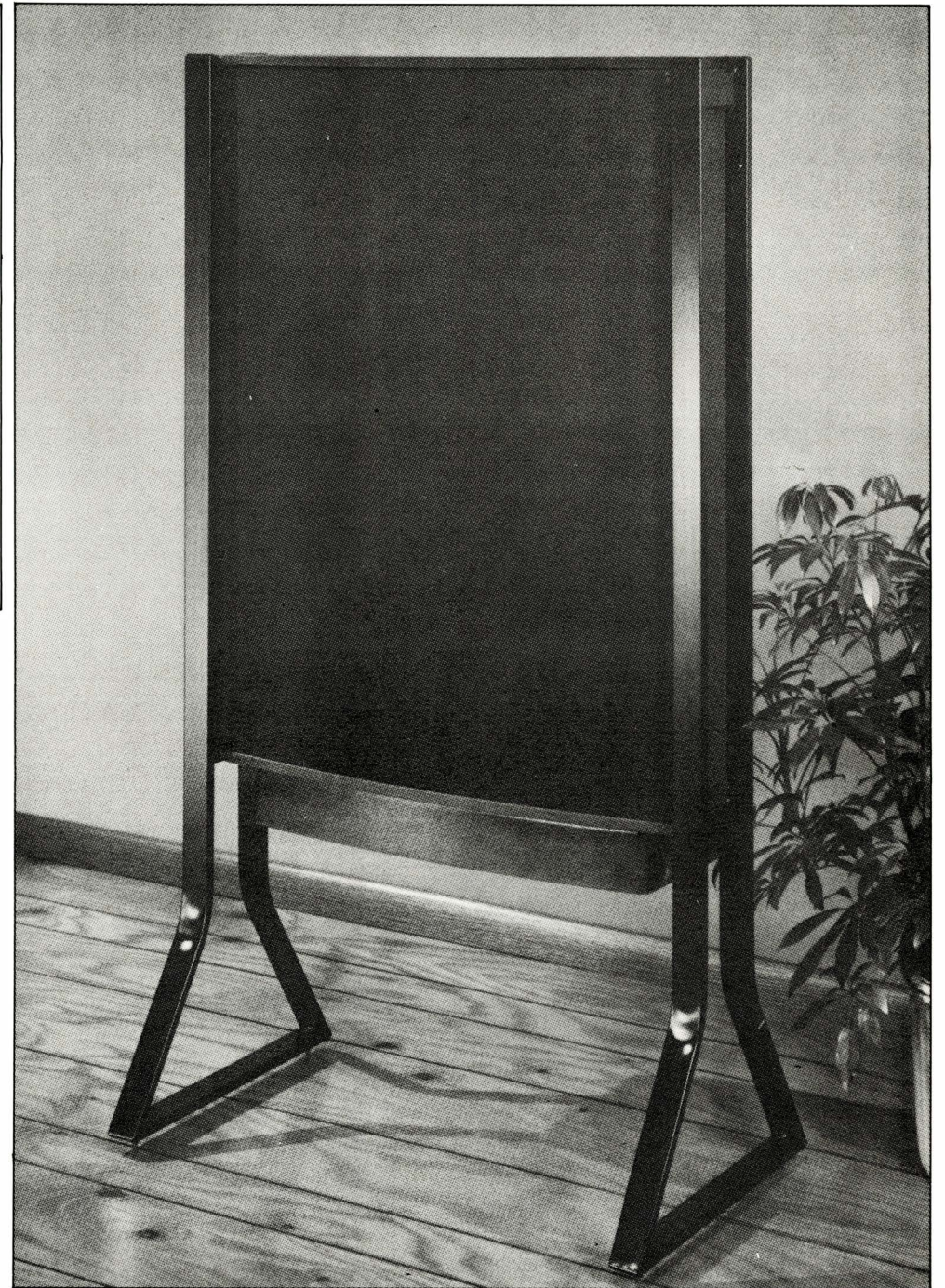
**DEALER
INQUIRIES
INVITED**

The Q-Z Quad stand for the original (classic) Quad Electrostatics

The Quad Stand by Arcici, Inc. (U.S.A.)

The Quad Stand by Arcici is the only commercially available stand for the Quad ESL-63 which works *with* the construction of the Quad instead of against it. The Arcici Stand clamps firmly to the upright channels that make up the sides of the ESL-63. It becomes an integral part of the loudspeaker giving the whole assembly rigidity and stability that, up 'til now, has been unattainable.

IMPORTED BY AND DISTRIBUTED IN THE U.K. BY ELECTROACTIVITY,
SHAMINT LIMITED, 11 MUSWELL AVENUE, LONDON N10 2EB. TELEFAX: 01-365 3614



The Quad stand by Arcici.

DENON PMA-250

HAYDEN LABS LTD., HAYDEN HOUSE, CHILTERN HILL, CHALFONT ST. PETER, BUCKS SL9 9EW. TEL: (0753) 888447.

RECOMMENDED



Three years after the original launch of Denon's first budget 'audiophile' amplifier, the now classic *PMA-250* has been re-launched in MkII guise. The presentation now looks a little fussy, even though much of the design shows minimalist influences. Bass, treble and balance controls are provided in a row across the black fascia, but all of these can be bypassed by a source-direct mode, which now operates on all line and disc inputs.

Selection between any of the three line (CD, tuner, aux) and the MM vinyl disc inputs is accomplished by a rotary control on the fascia, and this in turn controls a rack-switch mounted hard up against the input terminals. Similarly, the tape monitor facility is hardwired into position, while earth points in the disc, driver and power output stages are returned directly to the ground point on the power supply.

Audio grade electrolytics are used here, alongside metal film resistors and metal-banded styrol caps in the disc and voltage gain stages. A standard Far Eastern *5532* dual-channel op-amp forms the basis of the vinyl disc equalisation network, but at least Denon has not compromised in choosing the chunky Sanken output transistors used in the high-gain power amp.

LAB REPORT

The hardwiring of the main speaker outlets has helped reduce the output impedance in this new model from 0.25ohm to 0.09ohm, while power has been upped from 43W to 53W into 8ohms. The 4ohm figure is now 75W but the IHF dynamic headroom has fallen from +2.1dB to +1.6dB. Changes in PCB layout have improved channel separation figures while the A-wtd noise performance via MM vinyl disc has leapt from -75dB to a fabulous -80dB.

The RIAA response has hardly changed, still showing a mild tailoring of -3dB at 6Hz; the available headroom has reduced marginally from +31.1dB to +30.4dB (1kHz). The biggest change has occurred in the closed-loop linearity: the *PMA-250 II* now suffers some 0.039 per cent distortion instead of the earlier 0.007 per cent.

That this distortion is due to the power

amp stage is revealed by its very consistent level vs frequency on the Ultrasonic 3D plot. Second and third harmonics of the F_{20k} tone are visible together with 2nd-4th order inter-modulation products. As far as the audio band is concerned the most prominent routes are caused by $F_{20k} - yF_{0-20k}$ [$y=1,2$] - strong enough to disguise the RF demodulation at 100MHz but not the strong +18dB break at 1-15MHz.

SOUND QUALITY

Our listeners were uncertain of the differences between normal and 'source direct' modes of operation, particularly as both offered a very positive and tactile sound. Much of the spaciousness and natural 'breathing' quality of the PDM digital source was revealed in an amplifier which sounded far more confident than its status would suggest.

Brass instruments possessed a realistic bite; from the steady rasp of trumpet to the crack of percussion, this new *250* did its utmost to maintain a highly believable and almost tactile sound. However, if pushed a little too hard it responded with a slight loss of dexterity and poise in the very highest octaves; vocals became more sibilant, for instance.

One very positive aspect was an unwavering ability to recreate a powerful sense of drive and rhythm that urged the music onward without making it appear too forward or aggressive. Vinyl records sounded similarly rugged and well-defined, again benefiting from the solid bass line.

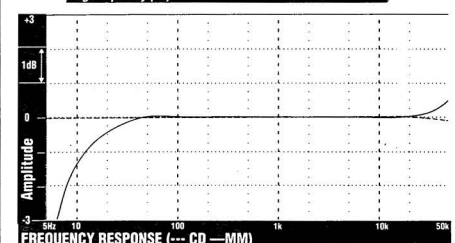
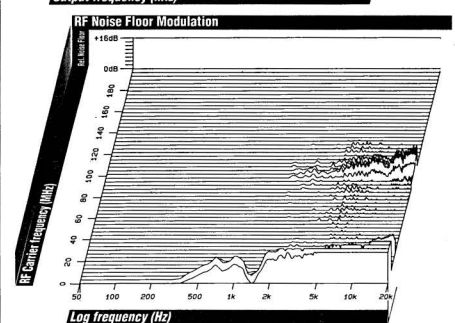
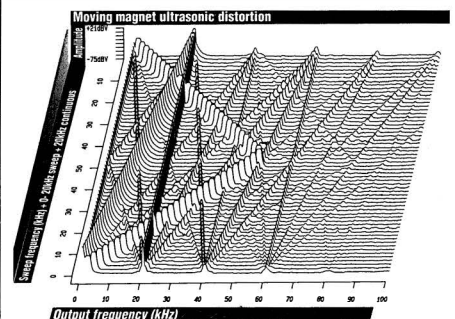
Percussion sounded surprisingly sharp and detailed, and the upper range of the amplifier develops a welcome sense of space and ambience. Although there was a slightly tizzy effect on some recordings, this did little to discourage our enthusiasm.

CONCLUSIONS

I am not totally enamoured of the *PMA-250*'s new 'look', but there can be little doubt about the improvements to its subjective performance. Distortion may have crept up slightly, but the new *250* goes louder and sounds more consistent than ever before, and may therefore be heartily Recommended.

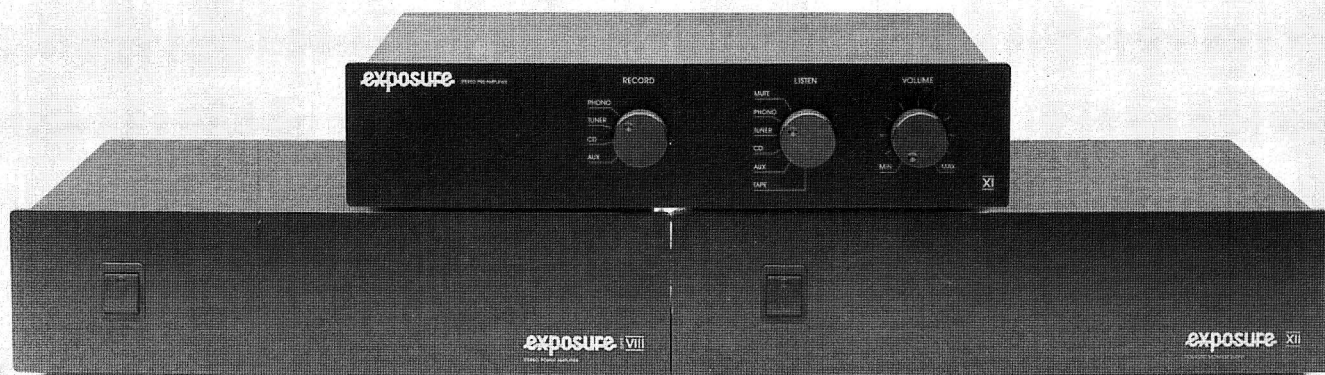
TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	49.0W	52.8W	50.8W
- 4ohms	62.3W	75.2W	69.0W
Dynamic headroom (IHF)		+1.56dB	(75.6W)
Peak Current (5msec, 1% THD)			9.2A
Output impedance	0.085ohm	0.095ohm	0.113ohm
Damping factor	94.5	84.5	70.5
	CD/Aux	MM	MC
Stereo separation (20Hz)	101.5dB	72.5dB	
(1kHz)	76.8dB	76.8dB	
(20kHz)	53.0dB	52.6dB	
Channel balance (-20dBV)	0.61dB	0.71dB	
(-60dBV)	0.45dB	0.66dB	
Total harmonic dist. (0dBW)	-68.6dB	-68.9dB	
($\frac{2}{3}$ power)	-68.3dB	-67.4dB	
CCIR intermod. dist. (0dBW)	-67.4dB	-65.7dB	
CCIR IM dist. ($\frac{2}{3}$ power)	-65.6dB	-66.7dB	
Phase shift (20Hz)	+4°20'	0°	
(1kHz)	0°	-49°20'	
(20kHz)	-13°20'	-92°10'	
Noise (A wtd, 0dBW)	-81.9dB	-80.2dB	
($\frac{2}{3}$ power)	-98.8dB	-83.3dB	
Residual noise (unwtd)	-74.3dBV	-74.4dBV	
Input sensitivity (for 0dBW)	26.49mV	44.11µV	
Input loading (for full output)	194.6mV	3.227mV	
Disc overload (20Hz)		17.75mV	
(1kHz)		165.9mV	
(20kHz)		1466mV	
(50kHz)		3276mV	
Rise time			6.1µsecs
Squarewave linearity			-93.9dB
Absolute phase			Non-inverting
Tape output/impedance			9.960V (disc)/127ohm
Input loading			46.1kohm/123pF 45.5kohm/198pF
DC offset, left/right			-47.5mV/+7.3mV
Typical retail price inc VAT			£140



EXPOSURE XI/XII/SUPER VIII

EXPOSURE ELECTRONICS, THE WORKS, 59 NORTH STREET, PORTSLADE, SUSSEX BN4 1DH. TEL: (0273) 423877.



Based in Sussex, Exposure is commonly represented as one of the arch-exponents of hi-fi 'minimalism', a reputation underlined by the rather utilitarian aesthetics of its amplifiers. That is until very recently when the entire range of electronics was re-equipped with new casework and solid 6mm alloy fascias.

So it is with the *VIII Super* power amplifier (first reviewed in March '89), and the new *XI* preamplifier. Like its cheaper brother (the *VII*), the *XI* is constructed in dual-mono fashion and requires connection to one of three possible external power supplies. Although this is Exposure's top preamplifier and perhaps deserves the top-of-the-line £1,030 *IX Pro* power supply, for the purposes of this test the more cost effective *XII* supply was chosen.

This uses Exposure's own electrolytics, together with a single 250VA toroid equipped with dual (L/R) secondaries. Like the *VI* and *IX* supplies, the *XII* utilises Linear Technology regulators to furnish two $\pm 24V$ rails; these are then further regulated down to $\pm 18V$ within the preamplifier itself.

All the relevant DC power connections are made using supplied DIN leads, while phono sockets are used for the audio inputs and outputs. The internal design and construction of the *XI* is little different from the cheaper *VII*, yet the improved casework, clearer logos and an independent record-out facility certainly make it look and feel distinctly superior. Gone, for instance, are the 'gram', 'master gain' and 'aux 1' labels to be replaced by the more conventional (if less precise) phono, volume and CD respectively; such is progress.

A total of five line and two disc inputs are provided, the latter selected via a toggle switch on the rear of the case. A proprietary

low-noise differential gain block is used as the input head-amp, recently revised for lower IM distortion. Both MM and MC inputs use an active LF/passive HF RIAA network composed entirely of discrete components and utilising both film and layer-type capacitors.

The six-way selector (including a mute position) is situated ahead of the constant-impedance volume control, subsequent differential gain block and Class A emitter-follower output. The low output impedance of 90ohms means that long interconnects may be accommodated. As a further adjunct to safety, a protection relay mutes the output at switch-on until its DC condition has stabilised (about 30 seconds).

Exposure's *VIII Super* power amp has been described before, though of course it is now blessed with the new alloy fascia. Standard phono input and recessed 4mm output sockets are provided. Inside, the two separate power amp 'cards' are fed from a substantial Holden & Fisher toroid with independent rectification and smoothing. Each mono card is matched for THD and IMD and each is equipped with very fast pre-drivers, drivers and custom *TO-3* style complementary output devices. Thermal protection is provided, though the emitter resistors themselves are likely to overheat first under sustained output conditions.

LAB REPORT

The dual-mono construction of both pre- and power amplifiers is reflected in the excellent midband separation figures of 93dB (line) and 116dB respectively, though in both instances capacitive coupling has led to an acceptable deterioration at 20kHz. Exposure's claims for lower THD and IM distortion through the disc inputs was borne out

by the tests, THD in the *XI* improving from its predecessor's $-49dB$ at 20kHz (MC input) to a mere $-72dB$ (0.025 per cent). CCIR IM distortion also fell from $-71dB$ to $-75dB$ via MM and, more importantly, from a poor $-42dB$ to $-56dB$ via the new MC stage.

These represent true improvements to the linearity of the vinyl disc circuitry, particularly as the overall 1kHz headroom has remained unchanged at 37.4dB and 33.2dB respectively. The 3D Ultrasonic Distortion graph for the *XI* concurs with these results. All traces of harmonic distortion are concealed by noise ($-68dB$ A-wtd), while straightforward 2nd-order difference IMD, $F_{20k} - F_{0-20k}$, increases with decreasing frequency as a function of the RIAA characteristic.

The high $+40^\circ$ phase shift encountered at 20Hz on the disc input is simply a function of a tight LF filter characteristic which falls rapidly below 50Hz to a $-3dB$ point of 12/18Hz (MC/MM).

Improvements to the *VIII Super* power amplifier are very specific and relate both to noise, which has fallen from $-77dB$ to $-103dB$ (ref 0dBW), and overall linearity. THD in the 20Hz-5kHz range has been reduced by 10-20dB in the last year though THD at 20kHz has actually risen from $-69dB$ to $-62dB$ (0.079 per cent) at two-thirds output. Nevertheless the output impedance remains constant at 0.23ohm with an additional phase shift of -23° at 20kHz - very similar to the results obtained one year ago.

The rise in HF THD is confined in the latest Ultrasonic distortion plot which depicts multiple-order IM routes associated with F_{20k} and its four subsequent harmonics at 40kHz, 60kHz, 80kHz and 100kHz. Only 2nd and 3rd-order routes are evident in the audio band, so the subjective effect should be

minimal. More important is the amp's broad susceptibility to RF noise in the 100-200MHz region, giving rise to a +22dB increase in noise 2-20kHz as a result of RF signals in the 150-160MHz band. Some degradation in treble transparency and purity may be expected in some environments.

SOUND QUALITY

With or without Exposure's own branded loudspeaker cable we achieved very favourable results via both the CD and disc inputs, the former offering a balance that was just slightly lean but pleasantly resolved throughout mid and treble. With almost casual refinement, music breathed from the speakers in a way that revealed much of the magic of the PDM digital converter. In fact this smoothness and fine detail resolution confirmed the soft transparency and musical conviction of both pre and power amplifiers.

However, the VIII Super could have done with more drive and low frequency impetus, the power of bass transients never quite matching our expectations. This effortless, refined but slightly cautious presentation was reminiscent of the VII/VIII's performance when auditioned a year ago, and as such tended to suit some styles of music more than others.

Classical or choral works of grand pretention were not its forte, yet with almost any other sort of music our listeners found these Exposures hard to fault. 'Gorgeous' and 'lush' were popular descriptions of a sound that was exceptionally fluid, well integrated and proved undemanding over long periods.

The MM/MC disc inputs elicited a similarly positive reaction, despite our feeling that the natural smooth midband was now joined by a slight edginess in the far treble via MC in particular. The music itself remained emotionally rewarding - which is at least half the battle - but there was undoubtedly more congestion across the soundstage than via the line input.

CONCLUSIONS

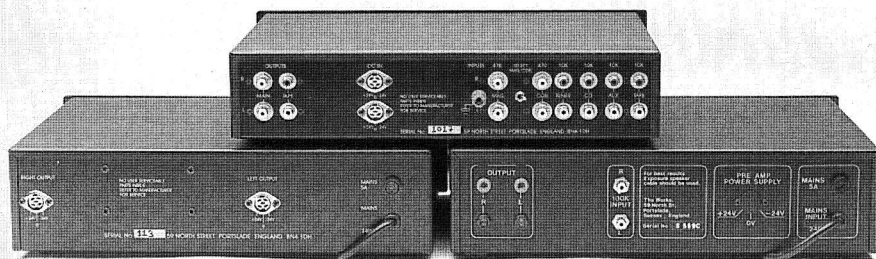
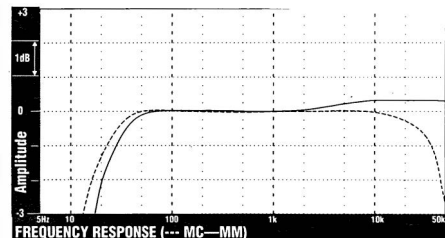
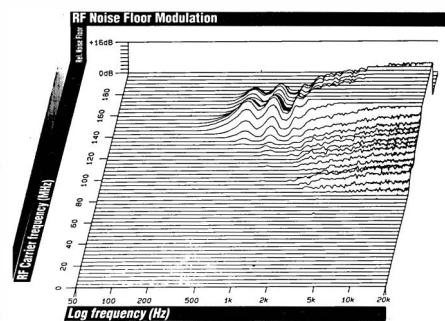
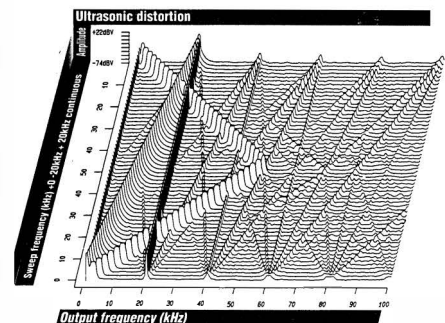
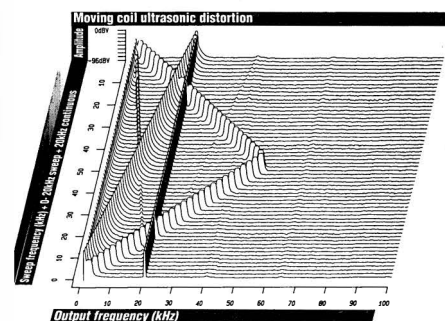
Neither too hard or clinical nor over-warm and mushy, the XI/VIII combination seems ideally suited to a neutral loudspeaker of good sensitivity and moderate size, bigger speakers being more likely to highlight our slight reservation regarding bass attack and extension. However, the mellifluous and captivating sound of this duo should still win through. The RF susceptibility would benefit from attention but recent improvements to linearity and overall build ensures a warm and continuing Recommendation.

TEST RESULTS

EXPOSURE XI/XII PSU

	Aux/CD	MM	MC
Stereo separation (20Hz)	120.8dB	91.3dB	92.5dB
(1kHz)	92.9dB	84.7dB	83.9dB
(20kHz)	67.1dB	58.5dB	58.3dB
Channel balance (0dBV)	0.02dB	0.05dB	0.08dB
(-20dBV)	0.02dB	0.03dB	0.04dB
(-60dBV)	0.12dB	0.12dB	0.12dB
Total har. dist. (0dBV, 1kHz)	-91.3dB	-79.6dB	-78.7dB
(0dBV, 20kHz)	-94.2dB	-78.7dB	72.3dB
CCIR intermod. dist. (1:1)	-79.6dB	-75.2dB	-55.9dB
Absolute phase			Non-inverting
Phase shift (20Hz)	+7°10'	+41°20'	+40°
(1kHz)	0°	-47°30'	-50°
(20kHz)	-18°	-99°30'	-100°30'
Squarewave linearity			-101.4dB
Noise (A wtd, 20Hz-20kHz)	-90.1dB	-76.3dB	-67.9dB
Residual noise (unwtd)	-90.9dBV	-91.2dBV	-91.1dBV
Input sensitivity (for 0dBV)	66.15mV	2.065mV	127.1µV
Disc overload (20Hz)		51.20mV	2.731mV
(1kHz)		372.8mV	22.86mV
(20kHz)		3350mV	219.3mV
(50kHz)		3950mV	191.9mV
Input loading	9.1kohm/100pF	46kohm/595pF	473ohm/14nF
Preamp Output (max)/Impedance		12.06V (disc)/9.4ohm	
Tape Output (max)/Impedance		11.94V (disc)/578ohm	
DC offset, left/right		0.0mV/0.0mV	
Typical retail price inc VAT		£580/£520	
POWER AMPLIFIER/EXPOSURE SUPER VIII			
Maximum Continuous	20Hz	1kHz	20kHz
Power Output - 8ohms	61.3W	61.4W	53.7W
- 4ohms	71.4W	78.9W	57.8W
Dynamic Headroom (HF)		+0.83dB (74.3W)	
Peak Current (5ms, 1% THD)			6.3A
Output Impedance	0.229ohm	0.232ohm	0.225ohm
Damping Factor	34.9	34.5	35.5
Stereo Separation (0dBV)	127.1dB	115.6dB	71.2dB

Total Harmonic Dist. (0dBV)	-85.0dB	-88.3dB	-60.9dB
(½ power)	-86.1dB	-100.4dB	-61.8dB
CCIR Intermodulation Distortion (0dBV)			-83.6dB
CCIR IM Distortion (½ power)			-76.7dB
Rise Time (@ 10kHz)			6.5µsecs
Squarewave linearity			-103.9dB
Absolute Phase			Non-inverting
Additional Phase shift 20Hz			+12°30'
1kHz			0°
20kHz			-23°30'
Noise (A wtd, 20Hz-20kHz) 0dBV			-103.0dB
(A wtd, 20Hz-20kHz) ½ power			-117.3dB
Residual noise (unwtd)			-88.3dBV
Input Sensitivity (for 0dBV)			184.2mV
(for full output)			1453mV
Input loading			17.9kohm/540pF
DC offset, left/right			-6.4mV/+1.5mV
Typical retail price inc VAT			£500



BILLY VEE SOUND SYSTEMS

BUDGET C/D SYSTEM OFFER

DENON 520 C/D
EXCELLENT BUDGET PLAYER +
WITH REMOTE CONTROL

DENON PMA 250/2
AMPLIFIER; THE DENON +
25 WATT BEST BUY!

JPW MINIM
GREAT SOUND FROM
THIS BUDGET BOOKSHELF

COMPLETE WITH 6MTR QED SPEAKER LEAD AND
FREE U.K DELIVERY MAIL ORDER (RING 852 1321)

ONLY £339.00

SALE OF EX DISPLAY/DEM EQUIPMENT !

MOSTLY BOXED AS NEW SOME WITH LIMITED OR NO USE. FULL GUARANTEE

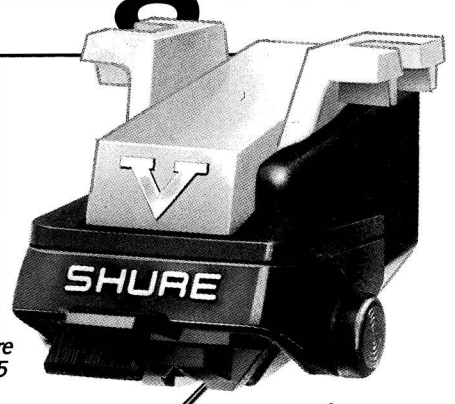
	WAS	NOW		WAS	NOW
AIWA ADF 270 CASS/DK.....	(99)	£79.00	J.P.W AP3 SPEAKERS.....	(210)	£149.00
AIWA ADF 700 CASS/DK.....	199)	£159.00	LINN LP12/ITOK/K9.....	(1053)	£625.00
AIWA ADWX 888 DOUBLE/DK... (249)		£199.00	(SERVICED WITH NEW BELT AND STYLUS)		
AIWA EXCEL 1A XK 009.....	(549)	£429.00	LINN LP12 (BLK)/ITT6K LU11.....	(998)	£675.00
ARCAM ALPHA SPEAKERS	(199)	£169.00	(SERVICED WITH NEW BELT)		
DENON DCD 620 C/D.....	(199)	£169.00	MARANTZ CD 12 C/D PLAYER....	(2999)	£179.00
DENON DRM 600 CASS/DK.....	(199)	£179.00	(BOXED MINT CONDITION-LITTLE USE)		
EXPOSURE X AMPLIFIER.....	(399)	£299.00	NAD 2200 POWER AMP.....	(389)	£289.00
HEYBROOK HB 100 SPEAKERS....	(249)	£179.00	MUSICAL FIDELITY BI AMP.....	(199)	£159.00
J.P.W SONATA SPEAKERS.....	(99)	£75.00	MUSICAL FIDELITY MUT PRE.....	(1199)	£589.00
J.P.W PI (BLK) SPEAKERS.....	(125)	£99.00	NAKAMICHI CRIE CHSS/DK.....	(345)	£229.00
			NAKAMICHI CRZE CHSS/DK.....	(389)	£299.00
			NAKAMICHI OMSIE C/D.....	(395)	£249.00



248 LEE HIGH ROAD, LEWISHAM, SE13 5PT
PHONE 318 5755 or 852 1321 MON-SAT 10.00am - 6.30pm (closed Thurs)



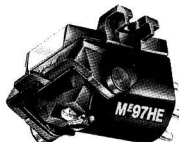
Shure cartridges. Still the best on record.



Shure
V15



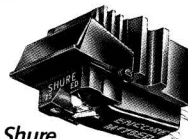
Shure
ML140HE



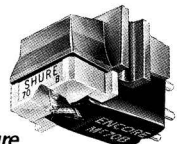
Shure Encore
ME97HE



Shure Encore
ME95ED



Shure
Encore
ME75ED



Shure
Encore
ME70B

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

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

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

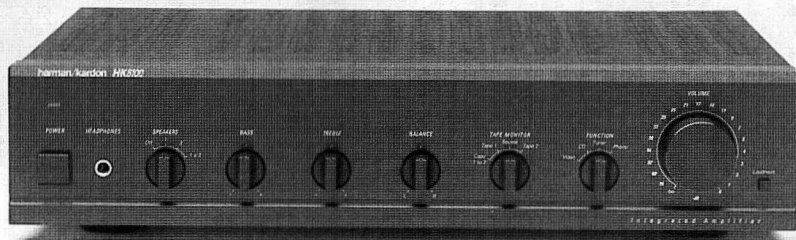
SHURE

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

HARMAN KARDON HK6100

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

RECOMMENDED



Harman Kardon has recently revamped its entire amplifier range, beginning with the budget *PM635i* which has been superseded by this new *HK6100*. However, I think the term 'restyled' might be more appropriate here, since the '6100 betrays little technical advance on the *635i*, while the aesthetic changes include a new style alloy fascia with a chamfered top edge.

All the input switching, record-out, balance and tone controls are much as before, organised in a row across the fascia with six identical-looking plastic knobs. Only the larger volume control and small loudness switch are easily distinguished, despite the fact that each knob is annotated with a dull gold lettering.

Video, CD and tuner inputs accompany facilities for two tape machines and one (MM) vinyl disc cartridge source. The main power output is still switched via the front panel to either or both of two speaker outlets; this is not an ideal solution, particularly since the switch contacts might deteriorate in time and so degrade the performance.

Elsewhere HK continues to use a discrete vinyl disc stage, as well as the same Toshiba output transistors in the power stage. The regulated power supply looks very similar too.

LAB REPORT

As far as the basic measurements are concerned there is little to distinguish the *HK6100* from its ancestor. Power output is pretty much the same at 47W into 8ohm, as is the slightly high 0.12ohm output impedance. Even the RIAA response adopts a similar profile, peaking slightly around 50Hz before rolling off to a -3dB point at 8Hz. The ultrasonic rise will be affected by loading of course.

Noise is slightly improved, the MM input A-wtd S/N ratio now 85dB relative to 3/4 output. Disc headroom has also been uprated from +28.3dB to +29.5dB but results for harmonic and intermodulation distortion remain virtually unchanged.

This may be crucial, since both the *635i* and now *6100* possess a 3rd-order distortion characteristic, a feature not to be encouraged. Note that the main 3rd-order IM product $F_{20k} - 2F_{0-20k}$ tracks into the audio

band. By contrast, HK has clearly got the RF filtering sorted out as RF IMD is very well controlled.

SOUND QUALITY

While not offering a staggering advance on the older *635i*, the '6100 delivered a similarly tight and detailed account of CDs. The sound was lean, yet punchy, exciting and dynamic, with some loss of purity and slight added hardness throughout the highest octaves, but very little cloudiness or smearing to obscure subtle musical clues. Indeed much of the spaciousness of the PDM digital source was revealed.

Vocals often lacked a little warmth and smoothness, but were nonetheless depicted with surprising poise and clarity. In all this amp gave the impression of being in control. It may have lacked the mellifluous qualities of its peers, yet for seat-of-the-pants excitement with scant brightness or false aggression it was difficult to fault.

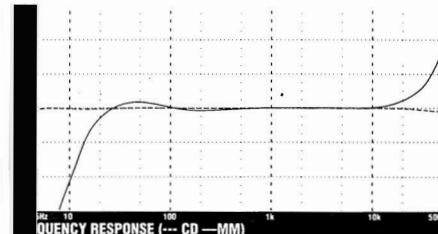
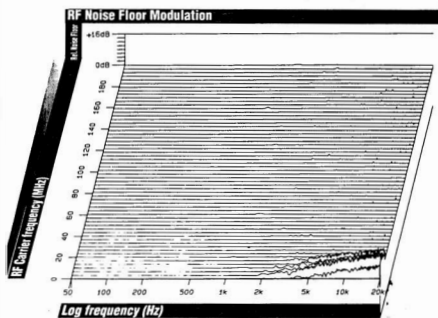
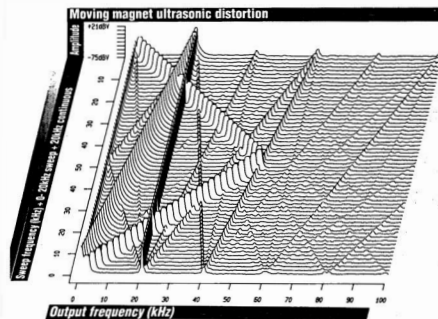
The MM vinyl disc input elicited a similarly positive reaction. Light, open and positive, it was unperturbed by the complexity and dynamic contrasts of our classical discs. Once again a tinge of brittleness was detected in the uppermost octaves, but the freedom from muddling or cloudiness was very refreshing.

CONCLUSIONS

The *HK6100's* predecessor fared well in an earlier amplifier test, so it is gratifying to be able to register similar approval and Recommendation one year on. Nevertheless questions over the nature rather than absolute level of distortion remain to be solved; perhaps HK's next generation might then enjoy a significant, rather than marginal, improvement in quality.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	47.1W	46.9W	43.9W
- 4ohms	69.6W	71.1W	70.7W
Dynamic headroom (IHF)		+1.08dB	(60.2W)
Peak Current (5msec, 1% THD)			11.4A
Output impedance	0.118ohm	0.118ohm	0.129ohm
Damping factor	67.5	67.8	61.8
	CD/Aux	MM	MC
Stereo separation (20Hz)	102.7dB	61.4dB	
(1kHz)	80.0dB	75.6dB	
(20kHz)	54.6dB	51.0dB	
Channel balance (-20dBV)	0.18dB	0.06dB	
(-60dBV)	1.39dB	0.83dB	
Total harmonic dist. (0dBW)	-74.9dB	-72.6dB	
(3/4 power)	-72.6dB	-70.9dB	
CCIR intermod. dist. (0dBW)	-84.5dB	-68.2dB	
CCIR IM dist. (3/4 power)	-79.1dB	-70.1dB	
Phase shift (20Hz)	+1°20'	+10°20'	
(1kHz)	-1°20'	-50°20'	
(20kHz)	-0°45'	-104°20'	
Noise (A wtd, 0dBW)	-84.6dB	-81.9dB	
(3/4 power)	-94.4dB	-84.8dB	
Residual noise (unwtd)	-74.5dBV	-74.6dBV	
Input sensitivity (for 0dBW)	24.75mV	399µV	
(for full output)	171.5mV	2.742mV	
Disc overload (20Hz)		17.15mV	
(1kHz)		150.0mV	
(20kHz)		1242mV	
(50kHz)		1925mV	
Rise time			3.6µsecs
Squarewave linearity			-88.3dB
Absolute phase			Non-inverting
Tape output/impedance		9.21V (disc)/971.5ohm	
Input loading		26.4kohm/228pF	52.5kohm/35pF
DC offset, left/right		-17.6mV/-15.5mV	
Typical retail price inc VAT			£159





good dealer
good equipment

the foundation of a good music



system
from

Hampshire Audio Ltd

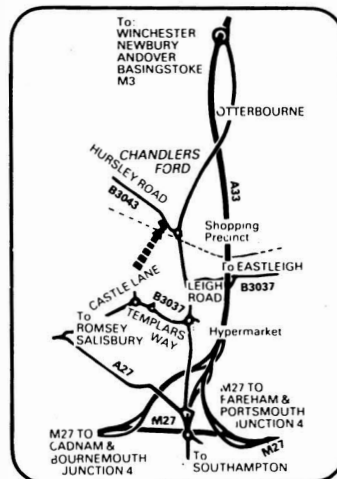
Kingfisher House
2-12 Hursley Road

Chandlers Ford, Hants SO5 2FU
Tel: Southampton (0703) 252827 & 265232

We stock selected items for:
Aloi, Audiolab, A&R, Audio Technica, B&W, Celestion, Celet, Cliff Stone, Creek, Cyrus, Denon, Dual, Gale, Goldring, Gyrodek, Heybrook, Hunt, Infinity, Jordan, KEF, Koetsu, Linn, Marantz, Mark Levinson, Maxell, Meridian, Michell, Mission, Monitor Audio, Monitor PC, Musical Fidelity, Nagaoka, Nakamichi, Ortofon, Perreaux, ProAc, QED, Quad, Revolver, Revox, Rogers, Rotel, Sennheiser, Tannoy, Target Audio, Supex, Wharfedale, and others. Active systems on demonstration.

with

The new **Cyrus** amps -



OPENING HOURS
TUES-SAT 10-6 THURS 10-8
CLOSED MONDAYS
(EXCEPT IN DECEMBER)

KELVIN LABS INTEGRATED

KELVIN LABS, 6 SHANKLIN CRESCENT, UPPER SHIRLEY, SOUTHAMPTON SO1 2RB. TEL: (0703) 785123.

RECOMMENDED



Cheapest of Kelvin Labs' amplifiers, the unimaginatively though accurately named *Integrated* is a true 20W Pure Class A design offering inputs for both MM and MC cartridges, plus tape and three line sources. For the present at least it's built into a basic metal case that looks rather like an *Absolute Zero* preamplifier with heatsinks! Two plastic knobs cater for input selection and volume (now an alps pot with better inter-channel tolerances), while two others cope with on/off and tape/line monitoring. Perhaps fortunately, restyling is imminent, although the internal construction is destined to remain the same.

The topology of this amplifier has been carefully considered. The application of proprietary cascode techniques have significant bearing on both the insensitivity to RF noise and the fine sound quality.

The power supply is based around a small 60VA toroid and 2x15,000 μ F reservoir caps, this feeding the phono, line and power amp sections. Discrete gain cells, made up of complementary long-tailed pairs and a current mirror, are used in the MC headamp and in the MM/active-RIAA equalisation stages.

However, the crux of the *Integrated* lies in its use of a Pure Class A output stage. Pairs of Motorola *MJ3001/MJ2501* Darlingtons are used, each series-pair subject to a quiescent RMS current of 1.6A, yielding a maximum RMS Class A power of 20.5W into 8ohms.

LAB REPORT

Within the 1 per cent THD limit, power output measured some 18W into 8ohms with a +1.8dB rise (to 27W) into 4ohm; this model is clearly no powerhouse. Stereo separation clocked a fabulous 95-100dB midband, matched by the equally low A-wtd noise figures via the CD and MM inputs.

On both disc inputs headroom could be improved in my opinion, the +25.1dB MM figure being a little better than the +22.9dB for the MC stage. Moderate use of feedback reduces the output impedance to 0.02ohm and THD to just 0.0013 per cent via the line input. Distortion rises to 0.019 per cent via MC disc (see 3D plot) but is mainly 2nd-order in nature. However, the IM distortion is 2nd and 3rd-order within the audio band, but

4th or higher above 20kHz.

SOUND QUALITY

Auditioned towards the end of a protracted series of listening tests the performance of the *Integrated* came as a breath of fresh air to all listeners. It was one of few amplifiers capable of preserving the natural airiness and delicacy of the PDM digital source, revealing subtle ambient musical details that were often buried by the competition. Vocalists were heard to breathe in a very lifelike fashion; images were ghost-like but still sharp in focus and surprisingly realistic.

There was no sense of coercion, music simply 'happened' in front, to the sides and behind the speakers in an effortless and dreamlike way. Our listeners breathed a sigh of relief and sank back to absorb and enjoy the highly charged and emotive qualities of the reproduction music.

The only dissenting remark – and one that was universally agreed upon – concerned a loss of bass weight and power. The *Integrated* certainly did not sound soft, woolly or confused, but the very deepest bass notes were diluted in weight if not in clarity or focus.

This marginally light quality was more obvious via the disc inputs. Although still very open, fresh and detailed, the amplifier somehow managed to lose some of the authority and majesty of an orchestral climax. However, the uncluttered and inherently musical sound enjoyed via the CD input was still retained, as was the delicacy of touch in a treble which was packed full of fleeting details without smearing or sibilance.

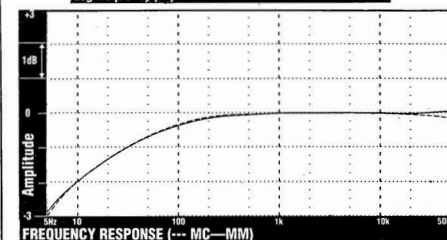
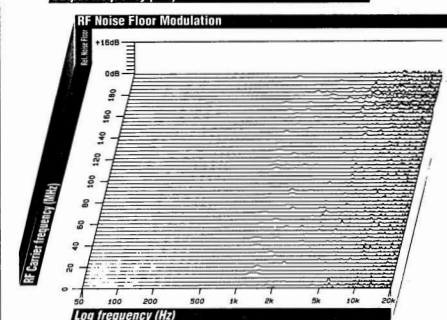
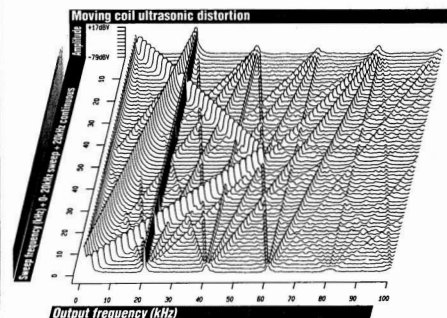
CONCLUSIONS

This is a genuine 20W Class A integrated amplifier, and therefore a welcome addition to the UK audio scene. The limited power output and lack of subterranean bass make it most suitable for use with small or medium sized speakers of highish sensitivity. Yet there need be no restriction on the quality or price of said loudspeaker.

As far as detail resolution, transparency and sheer musicality are concerned, Kelvin Labs *Integrated* is a David amongst Goliaths.

TEST RESULTS

	20Hz	1kHz	20kHz	
Maximum Continuous Power Output – 8ohms	17.6W	17.8W	16.9W	
– 4ohms	25.5W	26.9W	27.5W	
Dynamic headroom (IHF)		+0.61dB (20.5W)		
Peak Current (5msec, 1% THD)			4.7A	
Output impedance	0.021ohm	0.021ohm	0.028ohm	
Damping factor	375.6	377.5	281.7	
Stereo separation (20Hz)	CD/Aux	MM	MC	
	(1kHz)	99.7dB	96.8dB	
	(20kHz)	95.1dB	94.9dB	
Channel balance (–20dBV)	CD/Aux	MM	MC	
	(–60dBV)	2.6dB	2.9dB	
	(–60dBV)	2.6dB	2.6dB	
Total harmonic dist. (0dBW)	CD/Aux	MM	MC	
	(% power)	–104.7dB	–77.8dB	–74.3dB
	(% power)	–102.9dB	–77.5dB	–74.3dB
CCIR intermod. dist. (0dBW)	–98.1dB	–75.1dB	–80.4dB	
CCIR IM dist. (% power)	–94.8dB	–73.8dB	–78.9dB	
Phase shift (20Hz)	CD/Aux	MM	MC	
	(1kHz)	+7°0'	+4°30'	+5°30'
	(20kHz)	0°	–49°40'	–48°40'
Noise (A wtd, 0dBW)	CD/Aux	MM	MC	
	(% power)	–89.5dB	–84.6dB	–71.0dB
	(% power)	–97.4dB	–85.9dB	–71.4dB
Residual noise (unwtd)	–71.6dBV	–71.5dBV	–71.4dBV	
Input sensitivity (for 0dBW)	CD/Aux	MM	MC	
	(for full output)	64.5mV	897.7 μ V	65.5 μ V
	(for full output)	275.6mV	3.75mV	255.8 μ V
Disc overload (20Hz)	CD/Aux	MM	MC	
	(1kHz)	11.5mV	0.85mV	0.85mV
	(20kHz)	89.6mV	6.95mV	6.95mV
(50kHz)	455.9mV	37.7mV	37.7mV	
(50kHz)	425.0mV	33.1mV	33.1mV	
Rise time			4.1 μ sec	
Squarewave linearity			–104.9dB	
Absolute phase			Non-inverting	
Tape output/impedance		5.95V (disc)/98ohm		
Input loading	10.1kohm/10pF	47.4kohm/68pF	156ohm/7.7nF	
DC offset, left/right			+1.7mV/+2.8mV	
Typical retail price inc VAT			£350	





MUSICAL IMAGES LIMITED

45 HIGH STREET
HOUNSLOW
MIDDLESEX TW3 1RH
TEL: 01-569 5802

AMPLIFIERS	Rotel RA810A	£109.90
	NAD 3225PE	£149.90
	A&R Arcam Alpha	£179.90
	MF B1	£199.90
	Yamaha AX630	£259.90
	Audio Innovations 300	£479.90
	AR Delta 60	£259.90
	A&R Delta 90.2	£399.90
	Marantz PM75	£449.90
	Audio Innovations 500	£889.90

TURNTABLES	Ariston Q Deck inc cart	£165.90
	AR EB101 inc cart	£229.90
	Dual CS5000 BK	£199.90
	Systemdek II XE	£249.90
	Michell Syncro/syncro Arm	£329.90
	Michell Gyrodec IRB300	£689.90
	Alphason Sonata ex. arm	£689.90
	Roksan Xerxes Tabriz arm	£845.00
Roksan Xerxes/ Artemiz arm	£1190.00	

TAPE DECKS	Aiwa ADF270	£99.90
	Yamaha KX130	£119.90
	NAD 6325	£159.90
	Aiwa ADW77	£179.90
	Aiwa ADF800	£249.90
	Akai GX52	£249.90
	Kenwood KX5010	£269.90
	Nakamichi CR1E	£344.90
	Nakamichi CR2E	£394.90
	Nakamichi RX202E	£539.90
Revox B215	£1481.00	

Demonstration room facility
Part Exchange facility
Instant Credit facility

SPEAKER CABLES
VAN DEN HUL
MONSTER
SUPRA
QED
A&R Livewire

HEADPHONES
STAX
SENNHEISER
BEYER
AKG
QUART

CARTRIDGES
A&R
AUDIO TECHNICA
GOLDRING
NAGAOKA
ORTOFON
SHURE
STANTON

ARMS
ALPHASON
KUZMA
SME
ZETA (VdH wired)
ROKSAN

INTERCONNECTS
MONSTER
VAN DEN HUL
QED
DISCWASHER
CHORD CO.
A&R Livewire

MUSICAL IMAGES VOUCHER

£25 OFF

WHEN YOU SPEND £250 OR MORE!!

Offer is not available on sale or special offer items

REEL TO REEL	Teac X300 R-X2000
	Revox B77 MkII

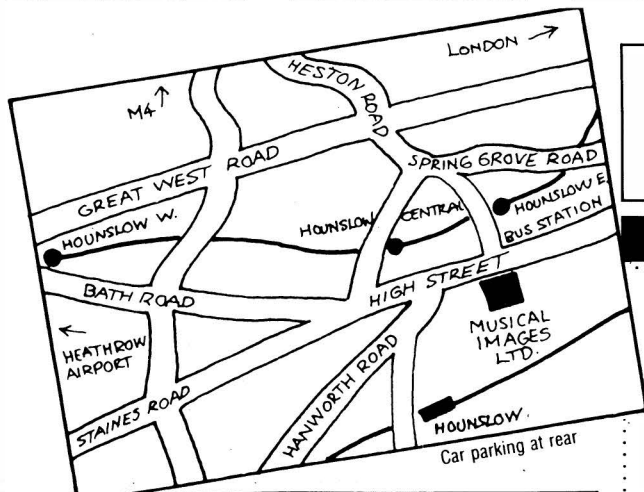
MISC.	Yamaha DSR100	£329.90
	Yamaha DSP100	£399.90
	A&R Black Box I	£259.90
	Musical Fidelity Digilog	£399.90
	Proton AI 3000	£649.90
	Yamaha AST SC10	£599.90

CD PLAYERS	Philips CD610	£159.90
	Kenwood DP5010	£249.90
	Pioneer PD7300	£319.90
	Rotel RCD 865	£299.90
	Philips CD840	£349.90
	Kenwood DPX9010	£499.90
	A&R Alpha CD	£349.90
	A&R Delta 70-2	£549.90
	A&R Delta 170	£599.90
	Pioneer PD91	£849.90

SPEAKERS	JPW Sonata	£99.90
	Celestion 3	£109.00
	Monitor Audio 7	£149.90
	Wharfedale 505.2	£169.90
	Castle Durham	£199.90
	Tannoy DC 2000	£299.90
	Bose AM5	£499.90
	Spendor SP1	£699.90
	Kef 104.2	£895.00
	Bose 901	£1599.00
Kef 105	£1690.00	
B&W 802	£1750.00	

TUNERS	Kenwood KT1010	£99.90
	Yamaha TX300	£119.90
	NAD 4225	£149.90
	A&R Alpha 2 Tuner	£164.90
	Rotel RT850AL	£179.90
	Pioneer F656	£199.90
	A&R Delta 80	£299.90
	Pioneer F91	£349.90
	Revox B160	£745.00

PRE POW AMPS	Quad
	Musical Fidelity
	Alphason
	Yamaha



BUYING HI-FI EQUIPMENT FOR SCHOOLS OR COLLEGES?

Call and ask about the great deal we offer educational establishments!

MAIL ORDER COUPON

Please send me the following _____

Name _____

Address _____

Telephone _____

I enclose cheque £ _____ Access/Barclaycard No _____

Signature _____

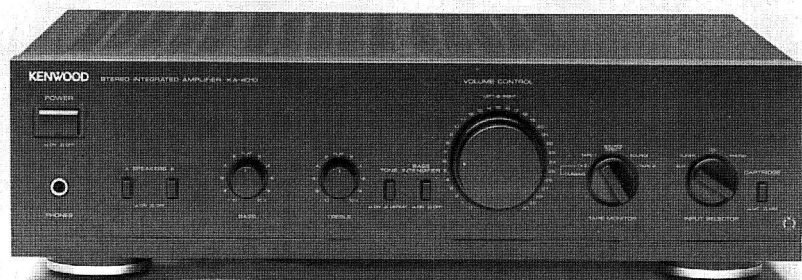
EXPORT ENQUIRIES WELCOME

Carriage is only £6 per order and FREE if total exceeds £300 (UK mainland). All goods are insured against loss or damage in transit. Please allow 28 days for delivery

KENWOOD KA-4010

TRIO KENWOOD UK LTD., KENWOOD HOUSE, DWIGHT RD., WATFORD, HERTS WD1 8EB. TEL: (0923) 816444.

RECOMMENDED



Latest of Kenwood's specifically UK-oriented amplifiers, the *KA-4010* effectively replaces the earlier *KA-660D* and joins the hierarchy alongside the *KA-5010* and *7010*. Like its companions, the *5010* features a satin-black alloy fascia, in this case dominated by a dual-concentric volume control. To the right lie two identical function selectors, one for tape monitoring and the other to select the three main line inputs. Moving magnet and moving coil vinyl disc cartridges may also be accommodated.

Other features include a 'bass intensifier', A/B speaker switching, a gold-plated headphone socket and bass and treble tone controls. This tone control circuitry is completely bypassed when the unit is used in 'source direct' mode.

Inside, the amplifier is well built, and features Kenwood's 'star' grounding layout. The power supply uses two damped 10,000 μ F Elna reservoir capacitors, and a separate PCB isolates the *B1162/D1717* output transistors from vibration. A solidly clamped alloy heatsink follows the same rationale, and even the output muting relays are damped with a rubber pad!

LAB REPORT

RF filtering plays an important role throughout this amplifier design, and this, rather than any inherent feature of the active topology, gives rise to the 'blank' RF IMD plot – a fine result nonetheless. A healthy 2.1dB power increase is delivered when reducing the load from 8 to 4ohms, while the 17.5A peak current rating should help maintain this 'stiffness' into still lower impedances.

Channel balance is excellent while the use of a differential FET input for the disc stage (cf. Marantz) helps keep the noise levels very low; -90dB A-wtd (ref $\frac{1}{3}$ output) is quite superb. The MM vinyl disc eq response plot is extremely flat and extended; MC rolls off by -3dB at 6Hz. Any associated phase shifts are mild, though the HF roll-off of the MC input is reflected in its marginally higher -112 degrees at 20kHz.

Disc headroom is marginally poorer via the MC input, yet THD appears to be dictated by the final output stage, increasing to 0.007 per cent at $\frac{1}{3}$ output. In fact the 3D plot

indicates that intermodulation rather than harmonic distortions prevail, with 2nd, 3rd and 4th-order products clearly visible.

SOUND QUALITY

Despite a slightly lean and dry CD sound, this new budget contender still managed to capture the vividness and conviction of most forms of music. The resolution of stringed and brass instruments was very good for an amplifier of this price – pleasantly detailed and fairly true to the timbre of the instruments. Certainly not as transparent as some of its peers, it is still considerably more refined than much of its mass market competition.

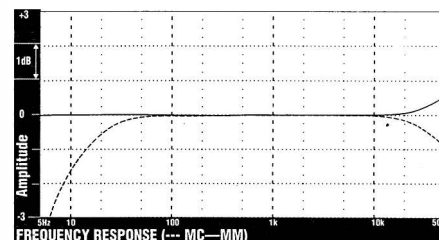
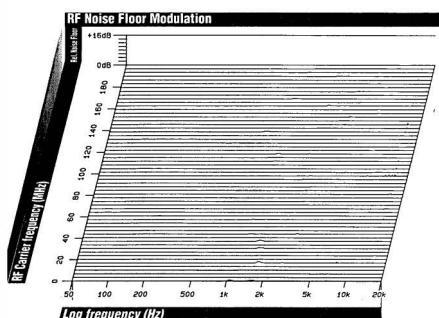
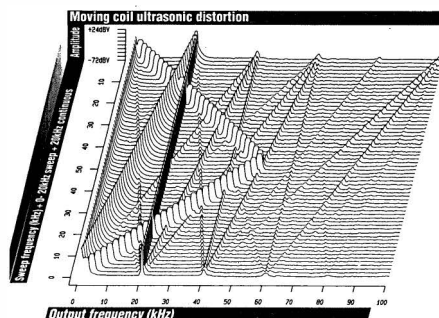
The MM vinyl disc input retained much of this smooth and cultured style, though the leanness noted via CD was now that much more obvious, regardless of whether or not 'source direct' was brought into play. Consequently, the weight and confidence of strong bass lines was occasionally undermined, imparting a slightly directionless feel to the overall sound. Compared to the relatively open and unfettered character of the line input, the disc stage also seemed slightly more packaged or compressed, introducing a little extra strain into the music.

CONCLUSIONS

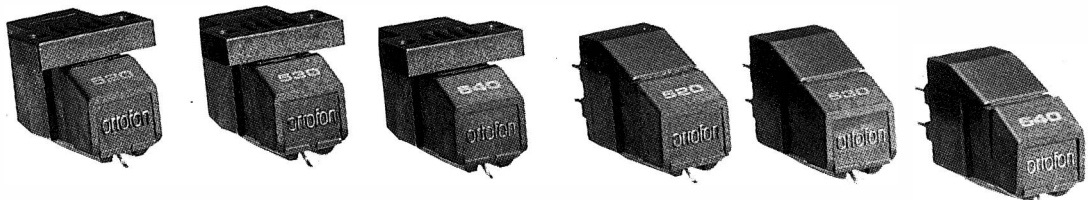
Compared to other semi-specialist amplifiers, the *KA-4010* is neither as potent nor as invigorating in its approach to reproducing music. Nevertheless, with good flexibility, very fair price and reserves of power in hand, coupled with a very balanced and comfortably detailed sound, it still warrants cautious Recommendation.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output – 8ohms	81.3W	81.3W	75.1W
– 4ohms	129.8W	132.3W	120.2W
Dynamic headroom (IHF)	+ 1.1dB (105.2W)		
Peak Current (5msec, 1% THD)	17.5A		
Output impedance	0.052ohm	0.053ohm	0.052ohm
Damping factor	155.1	152.2	155.0
Stereo separation (20Hz)	65.1dB	61.8dB	59.5dB
(1kHz)	62.8dB	60.7dB	60.4dB
(20kHz)	41.1dB	41.0dB	40.9dB
Channel balance (-20dBV)	0.03dB	0.07dB	0.15dB
(-60dBV)	0.14dB	0.09dB	0.07dB
Total harmonic dist. (0dBV)	-88.8dB	-91.7dB	-91.2dB
($\frac{1}{3}$ power)	-82.5dB	-83.8dB	-83.2dB
CCIR intermod. dist. (0dBV)	-82.5dB	-76.1dB	-80.6dB
CCIR IM dist. ($\frac{1}{3}$ power)	-76.2dB	-76.2dB	-77.1dB
Phase shift (20Hz)	+2°20'	+5°30'	+2°30'
(1kHz)	0°	-50°30'	-49°50'
(20kHz)	-33°40'	-102°40'	-111°40'
Noise (A wtd, 0dBV)	-79.8dB	-78.2dB	-73.1dB
($\frac{1}{3}$ power)	-95.0dB	-89.7dB	-73.7dB
Residual noise (unwtd)	-78.6dBV	-78.2dBV	-78.1dBV
Input sensitivity (for 0dBV)	19.6mV	318.4 μ V	25.9 μ V
(for full output)	178.8mV	2.817mV	229.5 μ V
Disc overload (20Hz)		17.1mV	1.41mV
(1kHz)		157.6mV	12.3mV
(20kHz)		1428mV	114.9mV
(50kHz)		1435mV	188.7mV
Rise time	7.4 μ secs		
Squarewave linearity	-104.9dB		
Absolute phase	Non-inverting		
Tape output/impedance	9.778V (disc)/1.25kohm		
Input loading	153kohm/650pF 43.8kohm/480pF 103ohm		
DC offset, left/right	+9.4mV/+5.1mV		
Typical retail price inc VAT	£170		



THE MAGNETIC FUTURE.



The Ortofon Series 500 cartridges are designed for precise, accurate retrieval of the delicate information in the record grooves.

What's more, the Series 500 cartridges accomplish this task amazingly well. As a music lover, you owe it to yourself to experience the warmth, the natural ease and uncanny realism with which they play music.

The Series 500 is the latest result of Ortofon's decades of experience as a leader in the field of magnetic cartridge design. The series incorporates innovative technology that sets new standards for the performance potential of a "traditional" magnetic cartridge.

The electrical system is based on established moving magnet principles, yet is far from traditional in its design. Through advanced CAD/CAM technology, we have succeeded in reducing the mass of the moving assembly, thereby gaining greatly enhanced treble response and a true three-dimensional soundstage reproduction.

These problems were resolved by yet another Ortofon innovation: slit pole pins which drastically reduce the eddy currents which occur in solid pole pins.

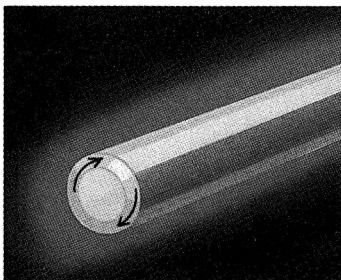


Fig. 1. Solid pole pin with circulating eddy current.

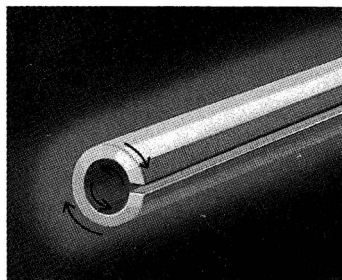
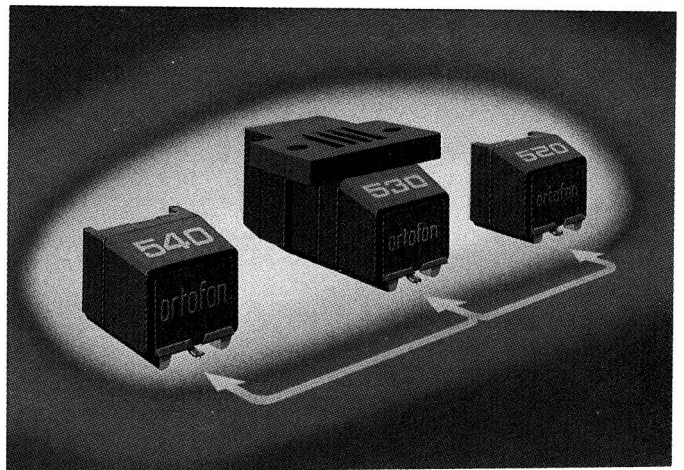


Fig. 2. Slit pole pin with new path of reduced eddy current.



The three Ortofon Series 500 stylus units are fully interchangeable with all cartridges in the series, both 1/2" standard as well as the P-mount versions (below).

The Series 500 consists of the Ortofon 520, the Ortofon 530 and the Ortofon 540. And since all three cartridges share the same electrical system, the difference lies in the stylus. The Ortofon 520 employs a nude Elliptical stylus, while the 530 incorporates a nude Fine Line shape and the Ortofon 540 is fitted with a newly developed, nude Fritz Gyger Type II stylus

In the best Ortofon tradition, the replaceable stylus units are fully interchangeable, allowing you to gradually improve your cartridge both conveniently and inexpensively.

But start by listening to the Series 500. Experience the magnetic future at your local dealer.

ortofon
accuracy in sound
0753 889 949

MARANTZ PM-50

MARANTZ AUDIO (UK) LTD., 15-16 SAXON WAY IND. EST., MOOR LANE, HARMONDSWORTH, MIDDX UB7 0LW. TEL: (01) 897 6633.



Marantz has long adopted a policy of continuous development, rather than changing a product each year simply for the sake of it. Consequently the arrival of this new *PM-50* middle-market amplifier is something of an event, this model effectively replacing the stalwart *PM-45*.

The design has minimalist pretensions, but is still equipped to handle four line inputs, two tape decks and both MM and MC vinyl disc sources. The style is smoother and more refined than previous units, the upper half of the matt black alloy fascia accommodating a rotary input selector and large volume control. The lower section has balance, bass and treble rotary controls plus pushbuttons for A/B speaker selection, mono operation, tape monitoring and 'source direct'.

Source direct in fact bypasses the main selector, tone and balance circuitry by means of an encapsulated Anritsu relay, feeding line-level signals directly from the volume control to the integral power amp. The internal design is similar to earlier Marantz amplifiers, featuring a low impedance power supply, symmetrical power amp construction and a discrete phono headamp based around low-noise FETs. Once again Marantz has opted for an STK supply/driver hybrid, while the complementary output transistors are the same as those used in the *PM-65* AV amplifier.

LAB REPORT

The supply regulation is very tight, as evidenced by the healthy 2.3dB power increase from 8 to 4ohms and high 21A peak current, alongside lowish (+1dB) IHF dynamic headroom. The *PM-50* should be very load-tolerant as a result. Stereo separation, channel balance and noise are all exceptionally good, particularly via the CD and MM vinyl disc inputs. However the disc input positive phase shifts measured at 20Hz are quite high and probably relate to the abrupt LF roll-off of the RIAA eq stage (see response plot).

Both disc inputs show an acceptable 30dB headroom, while the 20dB difference in sensitivity is textbook stuff. Distortion is extremely low via all the inputs (0.0019 to 0.0011 per cent), CCIR IMD only creeping up by

10-15dB via the disc inputs. The 3D plot shows that summation IM products are of most interest, $yF_{20k} + yF_{0-20k}$ [$y = 1,2$] representing the most obvious routes. RF IMD breaks through below 20MHz but is well contained thereafter.

SOUND QUALITY

According to our listening test results, the lean and transparent sound of earlier middle-market Marantz amplifiers has given way to a warmer and less distinct approach. The *PM-50* began many tracks with a pleasantly open and smooth balance, only to become slightly more confused and hazy once more instruments had joined the fray.

This was a pity, for the *PM-50* had many strong points, notably a bass which dug deep, revealing a tactile and earthy ruggedness. Percussive sounds were equally smooth, sweet and tonally pure, if lacking a little in surrounding space or 'air'.

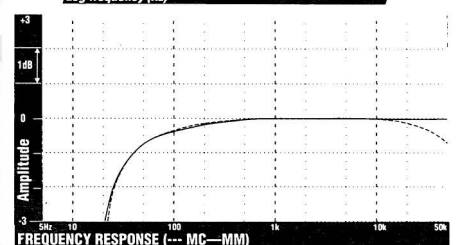
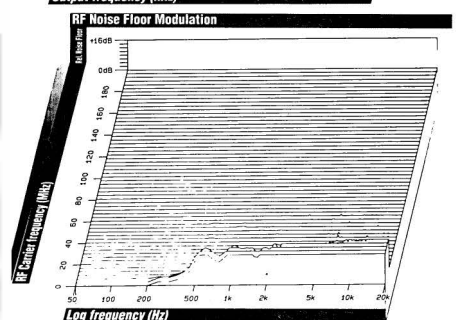
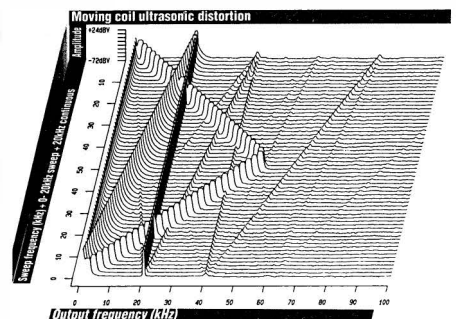
In fact the bass performance of this amplifier could be positively frightening – a little embellished perhaps but certainly very full and rich, giving the impression of awesome power and authority. This rich and meaty sound was similarly evident when listening via the MM vinyl disc input, counterpointed by a fast, sharp and articulate treble. Vocals were equally powerful, but for all its lungfuls of conviction, a little more subtlety would have not gone amiss. This amp goes for the jugular, make no mistake.

CONCLUSIONS

In terms of measured and subjective performance, the *PM-50* amounts to a very impressive amplifier. Yet its marvellously full and detailed sound was concentrated into too small a soundstage. If only the amplifier could develop more space to 'breathe', then it would undoubtedly sing better too. Beware of quick and superficially stirring demonstrations, since the *PM-50* is less certain to guarantee long-term satisfaction. Still, if brawn counts for more than finesse in your priority, the *PM-50* will be well worth a look.

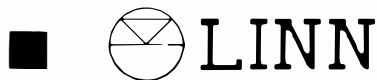
TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output – 8ohms	88.2W	91.5W	91.7W
– 4ohms	148.8W	155.0W	150.1W
Dynamic headroom (IHF)	+0.99dB (115.1W)		
Peak Current (5msec, 1% THD)	21.0A		
Output impedance	0.038ohm	0.038ohm	0.047ohm
Damping factor	211.3	208.1	170.2
	CD/Aux	MM	MC
Stereo separation (20Hz)	104.5dB	88.2dB	85.9dB
(1kHz)	87.2dB	86.7dB	86.5dB
(20kHz)	64.8dB	63.7dB	63.7dB
Channel balance (– 20dBV)	0.01dB	0.02dB	0.03dB
(– 60dBV)	0.23dB	0.29dB	0.35dB
Total harmonic dist. (0dBV)	–98.5dB	–97.8dB	–97.4dB
(½ power)	–94.5dB	–95.7dB	–95.2dB
CCIR intermod. dist. (0dBV)	–99.0dB	–88.6dB	–85.7dB
CCIR IM dist. (½ power)	–93.9dB	–87.9dB	–85.1dB
Phase shift (20Hz)	+15°50'	+36°0'	+45°30'
(1kHz)	0°	–48°30'	–48°45'
(20kHz)	–10°40'	–93°40'	–102°45'
Noise (A wtd, 0dBV)	–87.1dB	–84.3dB	–74.1dB
(½ power)	–97.1dB	–90.8dB	–74.9dB
Residual noise (unwtd)	–80.6dBV	–80.9dBV	–80.7dBV
Input sensitivity (for 0dBV)	18.15mV	277.5µV	28.5µV
(for full output)	174.7mV	2.712mV	263.5µV
Disc overload (20Hz)	24.55mV	2.773mV	
(1kHz)	163.5mV	16.81mV	
(20kHz)	1334mV	139.5mV	
(50kHz)	1725mV	206.5mV	
Rise time			3.5µsecs
Squarewave linearity			–103.8dB
Absolute phase			Non-inverting
Tape output/impedance	10.76V (disc)/223ohm		
Input loading	35kohm/240pF	45kohm/340pF	98.6ohm/1.9nF
DC offset, left/right	+12.2mV/+5.7mV		
Typical retail price inc VAT			£230



murray hi-fi

FOR REAL SOUND



103 a BEVERLEY ROAD
HULL HUMBERSIDE
HU31RX TEL: 0482 227867

19 MIDDLE HILLGATE
STOCKPORT CHESHIRE
SK1 3AY TEL: 061 429 7666

Bill Hutchinson

HI-FI, AUDIO & C.D. Centre

★ Sales ★ Service ★

ROTEL **KENWOOD**

marantz **Technics**

ARISTON **Dual** **KFF** **AIWA**

DENON **TANNOY** **JVC**

Mordaunt-Short **AR** **PIONEER**

YAMAHA **ACOUSTIC RESEARCH** **NAD**

BEST PRICES GUARANTEED ON ALL LEADING BRANDS

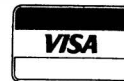
Our aim is to provide the highest level of service and value available in **Scotland**

OPPOSITE CENTRAL STATION

43 HOPE ST **GLASGOW** 041 248 2857

43 SOUTH CLERK ST **EDINBURGH**

031 667 2877



NO 1 FOR SERVICE AND VALUE



DYNAVECTOR

INTRODUCE NEW MOVING COIL CARTRIDGES WITH MAGNETIC FLUX DAMPING.

		NEW	EXCHANGE
XX-1	High output 2.0mV with switched flux damper, solid boron cantilever, line contact stylus	£680	£545
XX-1L	Low output with switched flux damper, solid boron cantilever, line contact stylus.	£680	£545
17D2 MkII	Low output with ruby cantilever, micro reach stylus	£280	£230
23RS MkII	Low output with ruby cantilever, micro reach stylus.	£230	£180
10X4 MkII	High output 2.0mV aluminium cantilever, nude diamond stylus.	£125	£102
50X MkII	High output 2.0mV aluminium cantilever, elliptical stylus	£99	£82

For further information and details of stockists, write to:
DYNAVECTOR SYSTEMS, 32, READING ROAD, WOODLEY, READING RG53DE.
TEL: 0734 699159

Please send further information of Dynavector cartridges to:

Name _____
Address _____
Postcode _____

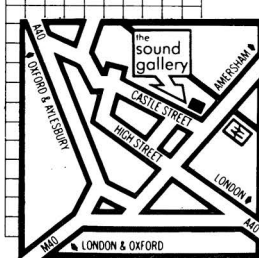
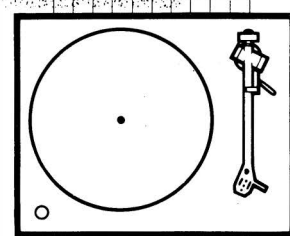
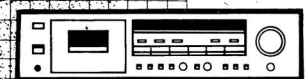
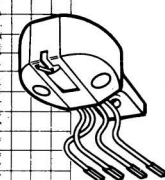
the sound gallery

ALL CONSULTANTS ARE THE SAME. AREN'T THEY?

THE SOUND GALLERY HAS ESTABLISHED AN ENVIABLE REPUTATION FOR ITS PROFESSIONALISM IN THE RECOMMENDATION AND DEMONSTRATION OF DOMESTIC HI-FI. WHATEVER YOUR BUDGET. WE CAN PROVIDE YOU WITH THE HIGHEST LEVEL OF MUSICALITY.

SO WHY COME TO US? FOR SERVICE. IT'S FRIENDLY YET INFORMATIVE. PROFESSIONAL YET COST-EFFECTIVE. TRY IT!

65 CASTLE STREET
HIGH WYCOMBE BUCKINGHAMSHIRE HP136RN
TELEPHONE 04941 31682



- ACOUSTIC ENERGY
- AUDIO LAB
- A + R
- B & W
- CAMBRIDGE
- CREEK
- CELESTION
- DENON
- EPOS
- GOODMANS
- HEYBROOKS
- KEF
- LINN PRODUCTS
- MORDAUNT-SHORT
- MARANTZ
- NAD
- NAIM
- NAKAMICHI
- REGA
- ROTEL
- SENNHEISER
- TANNOY
- WHARFEDALE
- YAMAHA



MUSICAL FIDELITY B1

MUSICAL FIDELITY LTD., UNIT 16, OLYMPIC TRADING ESTATE, FULTON ROAD, WEMBLEY, HA9 0ND. TEL: (01) 900 2866.

RECOMMENDED



Musical Fidelity is no stranger to success or controversy but this new £200 B1 integrated amplifier has already whipped up a storm of debate. Unfortunately it appears that various component changes occurred during the run up from prototype to final production, prompting another magazine to question MF's ethics.

There is neither space, nor would it be appropriate to become involved in this dispute. Suffice it to say that our sample serial number 030410, should be fully representative of normal production.

The sculptured matt alloy fascia is flanked by black plastic side cheeks and carries three rotary controls – volume, input selection and independent record-out selection. Inputs are provided for both MM and MC cartridges (switched on the case rear), alongside five line sources. The construction quality is very good indeed, using complementary BC550/560 devices (selected for their small signal parameters) in the disc headamp.

Dual-channel TL082 op-amps are used in the line and disc stages, the latter using shunt-feedback for RIAA equalisation. Complementary BD139/140 drivers are used in the integral power amp, feeding quasi-complementary, paralleled 2N3055 devices for the main output stage (four per channel).

LAB REPORT

In common with previous MF amplifiers, the B1 does not place great store in linearity. THD persists at 0.2 per cent and CCIR IMD at 0.1 per cent. This is a function of the power amp, so distortion is consistent from input to input and also with respect to frequency and level – no bad thing from a subjective viewpoint.

The 3D plot shows mostly 2nd, 3rd and 4th-order IM products given by $yF_{20k} - yF_{0-20k}$ [Y = 1,2,3] in the audio band, with harmonics and IM products as high as 5th and 6th order at higher frequencies. If nothing else then this broad carpet of closed-loop distortions should mask the high +23dB RF IMD that persists between 500Hz-20kHz as a result of RF noise in the 20-100MHz region.

A healthy +2dB IHF dynamic headroom was recorded, alongside a 1.4dB increase in

continuous power output when changing from 8 to 40hm loading. The only blot is the meagre 4.1A peak current output (<1 per cent THD). Noise is suitably low via all inputs (including MC at just -76dB A-wtd) but the rise time is a slow 13.5µsecs. The high (50°) phase shifts at 20Hz reflect the sharp LF roll-off observed on the disc eq plots.

SOUND QUALITY

Auditioned via its CD input, the B1 offered a very starkly defined sound. Bass lines had convincing weight and well-rounded solidity, while percussion enjoyed a delicacy and airiness untainted by the merest hint of smearing. All felt it provided a very definite and purposeful sound, building a convincing musical performance within a broad and deep soundstage.

It was the B1's exceptionally deep and controlled bass that particularly caught our attention, contrasting with a slightly harder midrange. Overall the presentation was uncompromising, detailed, ruthlessly revealing and an able partner for MF's Reference loudspeakers.

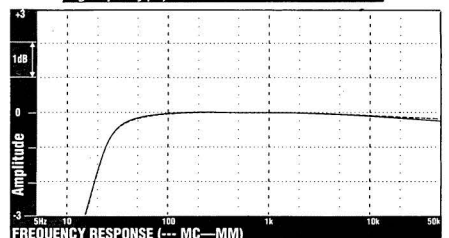
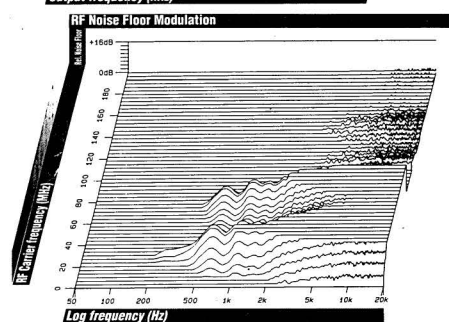
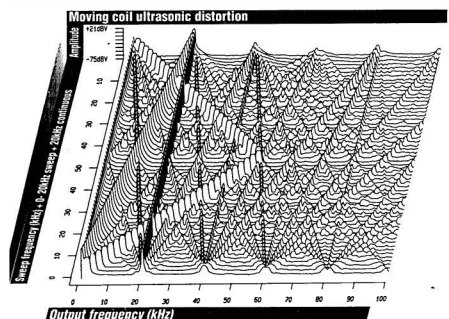
Slightly more sedate though no less detailed, via MM vinyl disc the music was served by a solid and tactile bass that was nevertheless notably less extended than that via CD. More important, the sound was both measured and exceedingly well balanced. Yes, there was a slight cloudiness compared to the line input, yet it still managed to appear very consistent even as the music became complex.

CONCLUSIONS

Regardless of the intrigue surrounding the evolution of the B1, current samples offer skin-of-the-teeth excitement without sounding either particularly muddled or overbearingly powerful. At £200 it represents excellent value; not quite a Best Buy, it is nevertheless heartily Recommended.

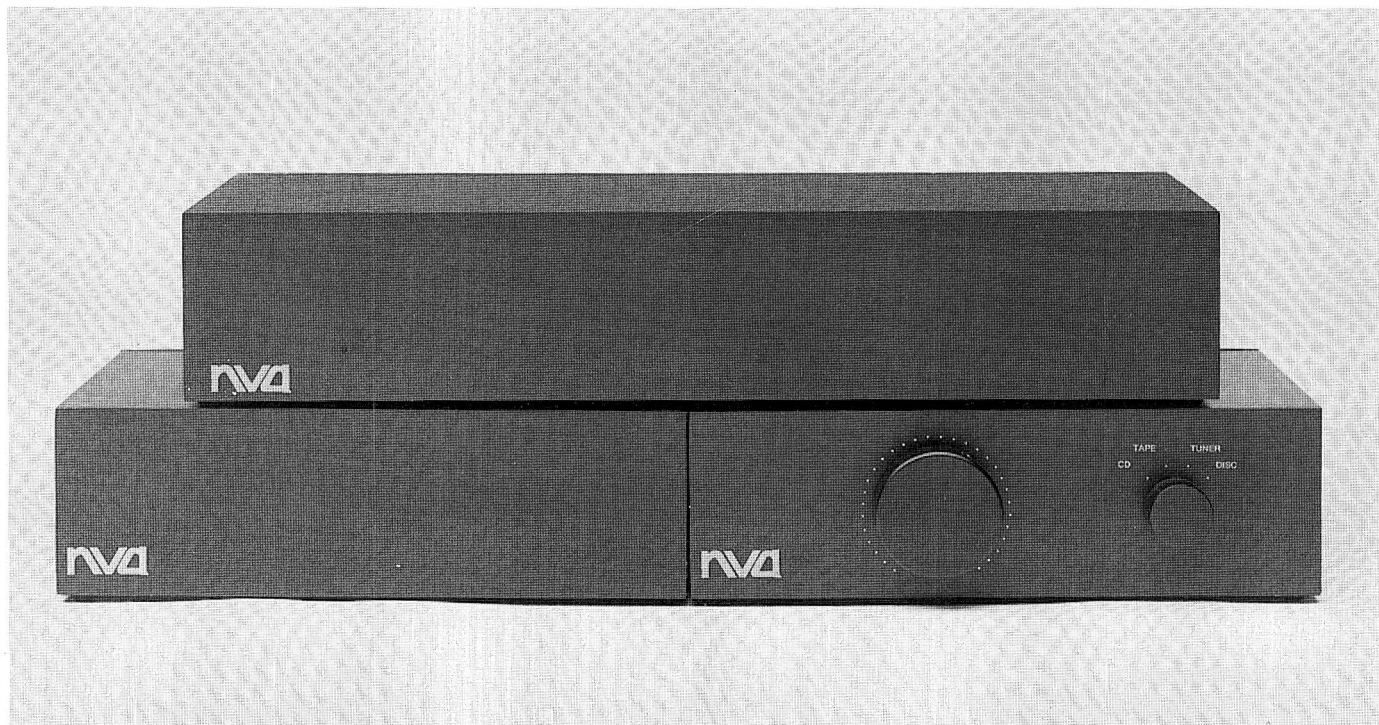
TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output – 8ohms	46.9W	49.2W	47.9W
– 4ohms	66.4W	67.7W	66.7W
Dynamic headroom (IHF)			+2.0dB (77.8W)
Peak Current (5msec, 1% THD)			4.1A
Output impedance	0.280ohm	0.293ohm	0.301ohm
Damping factor	28.6	27.3	26.6
Stereo separation (20Hz)	85.9dB	88.0dB	87.6dB
(1kHz)	60.1dB	59.0dB	58.9dB
(20kHz)	36.6dB	34.7dB	34.9dB
Channel balance (–20dBV)	0.59dB	0.45dB	0.47dB
(–60dBV)	4.13dB	2.54dB	2.22dB
Total harmonic dist. (0dBW)	–52.5dB	–54.6dB	–54.2dB
(½ power)	–54.3dB	–53.9dB	–53.5dB
CCIR intermod. dist. (0dBW)	–53.4dB	–53.1dB	–52.3dB
CCIR IM dist. (½ power)	–50.2dB	–49.9dB	–49.6dB
Phase shift (20Hz)	+10°50'	+50°20'	+50°30'
(1kHz)	–1°0'	–50°30'	–51°0'
(20kHz)	–50°30'	–135°0'	–134°30'
Noise (A wtd, 0dBW)	–82.4dB	–80.3dB	–75.1dB
(½ power)	–94.8dB	–83.6dB	–75.8dB
Residual noise (unwtd)	–70.5dBV	–70.2dBV	–70.3dBV
Input sensitivity (for 0dBW)	27.75mV	466.5µV	63.25µV
(for full output)	195.9mV	3.294mV	420.0µV
Disc overload (20Hz)		16.80mV	2.297mV
(1kHz)		128.8mV	17.36mV
(20kHz)		888.7mV	127.1mV
(50kHz)		1016mV	166.2mV
Rise time			13.5µsecs
Squarewave linearity			–76.6dB
Absolute phase			Non-inverting
Tape output/impedance		7.736V (disc)/57.9ohm	
Input loading	45kohm/40pF	49kohm/25pF	28kohm/105pF
DC offset, left/right			+8.9mV/+60.5mV
Typical retail price inc VAT			£350



NVA P70MC/PSU/A60

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



Nene Valley Audio may not be a part of the specialist 'establishment', so as to speak, yet that has not prevented the company from amassing an impressive range of products. In fact it is now possible to invest in a complete analogue-only NVA system.

A year ago we looked at the successful *AP30mc* integrated amplifier, a product that embodies similar design concepts to those featured in the costlier *P70mc/A60* pre/power combination that is reviewed here. Aesthetically there is little to comment on, for both the power amplifier, preamplifier and its associated power supply are each built into a sealed black alloy case.

Mains switches are included on the rear while facilities on the preamplifier proper are limited to a chunky alloy volume control (alps pot) and four-way input selector. Three line sources are catered for without extra gain (the device simply acting as a passive attenuator), while the sensitivity of the active disc stage is really only sufficient for medium to high output MC cartridges. Low output Ortofons, for instance, will not be an ideal match for the *P70mc*, whereas higher output magnetics are likely to fall foul of the limited headroom.

Situated within a third black case, the *PSU* has a 300VA toroidal mains transformer, two 4700 μ F Panasonic reservoir caps and a 25A bridge rectifier, which supplies a raw 45V DC via an umbilical to the *P70mc* preamp. Here the supply is further controlled down to $\pm 20V$ via a series of *LM317/LM337* regulators that feed each of four gain stages (two per channel).

Single-channel OP37 op-amps are employed, the first a straightforward gain stage followed by passive HF equalisation and the second using series-feedback for the LF RIAA equalisation arm. Decent polypropy-

lene capacitors are used in the disc stage which feeds straight into the selector and then the volume pot. Three paralleled outputs are provided for use in bi- or tri-amped systems.

The accompanying *A60* power amp features two captive phono leads for connection to the preamp, though standard 4mm output sockets are fitted for use with suitably terminated speaker cable – more of which later. NVA has opted for a high gain input stage, based around a long-tailed pair (*BC184s*) driving a current mirror. This then followed by *TIP29/30s* in a voltage gain stage and complementary *BDV64/65* high current Darlington at the output.

More important, NVA uses the minimum of compensation, with no Zobel network or series resistor at the output. As a consequence the *A60* power amplifier is not unconditionally stable into all cable/speaker loads, but requires the high series impedance of NVA's proprietary *LSI* cable to ensure complete security. Otherwise any ensuing RF instability can put a significant drain on the power supply, leading to an audible 50Hz sawtooth ripple. (NVA's thin speaker cable introduces sufficient series resistance to reduce the reactive element of the speaker load at very high (RF) frequencies, thereby keeping the amplifier within the bounds of its limited phase margin.)

LAB REPORT

Non-reactive loads were used for all the power amp tests, yet with THD increasing markedly with frequency, the 1 per cent limit was breached well before hard-clip into 8 or 4ohms at 20kHz. Thus the 43W recorded at 1 per cent THD becomes 67W with the amp driven to its clipping point. Similarly, the value of 71W recorded into 4ohm becomes

102W at clipping.

Good-ish power supply regulation had endowed the *A60* amplifier with a healthy 13A peak current and a 1.9dB power increase from 8 to 4ohms.

Stereo separation, noise and sensitivity are all fine, but both the Ultrasonic 3D plot and numerical results reveal the increase in THD/IMD with level and frequency. Typically 0.01 per cent midband, distortion rises to 0.36 per cent at 20kHz with 19/20kHz IMD increasing from 0.011 per cent at 1W to 0.25 per cent at $\frac{2}{3}$ output.

Bearing in mind the *A60*'s excellent RF rejection (see RF IMD plot), this implies that the vast majority of audible colorations will be determined by the amplifier's closed-loop performance. As such the 3D Ultrasonic plot highlights a wealth of mechanisms with very high order IM products such as $yF_{20k} - yF_{0-20k}$ [$y = 2,3,4,5$] tracking right into the audio band. Other IM products such as $F_{20k} - xF_{0-20k}$ [$x = 1,2$] are also evident within the audio band.

This demonstrates the importance of any amplifier's ultrasonic performance, and how nonlinearities here may well have subjective repercussions within the audio region. Life, the universe and everything does not cease above 20kHz...

THD also increased with frequency via the vinyl disc input, 0.0013 per cent at 1kHz increasing to 0.47 per cent at 20kHz. This is related to the limited overload margin of the disc stage which offers a midband figure of +25.3dB. Channel balance was also some 3-5dB awry at -60dBV. The 3D plot taken via the MC input reveals 2nd-4th harmonic distortions, but intermodulation is almost solely 2nd-order in character. Examples include $yF_{20k} \pm F_{0-20k}$ [$y = 1,2,3,4$] and $F_{0-50k-0} \pm F_{20k}$.

SOUND QUALITY

Used with NVA's proprietary speaker cable the potential benefits of the A60's low output impedance were lost, and a warmer but softer character emerged in consequence. Up-beat pop music could sound a little uncouth and splashy, but the subtler, more pessimistic tones of Tracy Chapman revealed the rather more sedate and refined amplifier lurking within.

Mid and treble details were pleasantly fluid and gentle, while the background to the soundstage was certainly very quiet. Yet deep bass was sadly lacking, an effect attributed to the high series resistance of the cable (amounting to some 0.8ohm over a 5m loop).

The listeners thought that the music 'hung together' in a pleasing and undemanding fashion. Yet despite the well-integrated and seamless presentation, they also recognised a slight loss of crispness and see-through transparency.

The vinyl disc input elicited a similar reaction, offering a comfortable and innocuous balance yet one with a slightly detached treble quality. Vocals were pleasantly articulate but not incisively detailed, despite a good sense of 'space' and ambience. Once again the main characteristic turned out to be the very lean bass. Despite the +1.25dB boost in response at 30Hz, rhythmic detail appeared to vanish at very low frequencies. The raw power and impetus of potent drum beats, such as tympani was traded for an altogether softer and more anaemic rendition.

CONCLUSIONS

These are straightforward, no-frills amplifiers best suited to sensitive, easy-to-drive loudspeakers. They offer a calm and collected but comfortably detailed sound, yet lack the ultimate transparency of the best pre/power combos. Unfortunately, hand-in-hand with simplicity of design come certain limitations, particularly in the stability margins of the power amp. Any dealer stocking

these products should be very aware of this and only supply LS1 or LS2 type speaker cable.

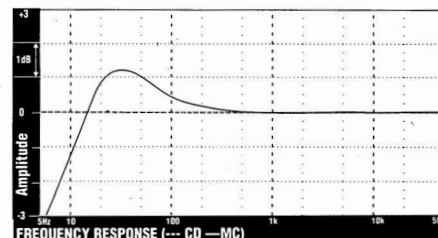
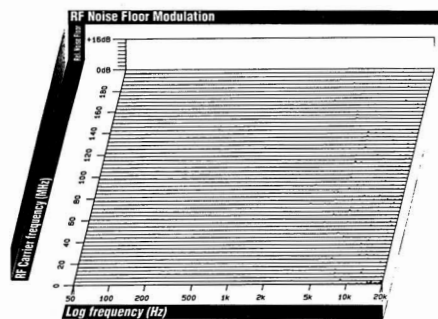
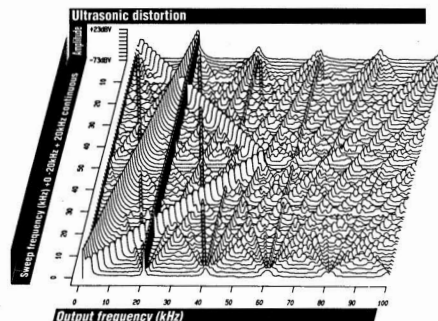
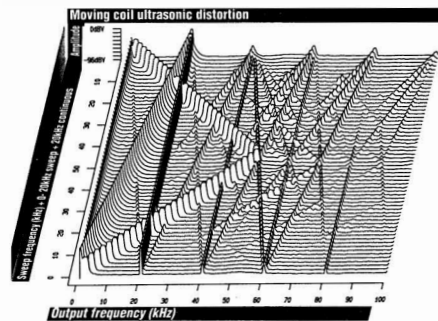
I feel duty bound to stress that these amplifiers have evolved to suit NVA's view of hi-fi music making. There is absolutely nothing wrong with this conscientious approach, yet by designing towards a system concept, the amplifiers will only realise their fullest potential when auditioned in said system. If you have been satisfied with NVA products in the past then the P70mc and A60 may be recommended, yet in the broader market context they must rate as 'worth considering'.

TEST RESULTS

PREAMPLIFIER

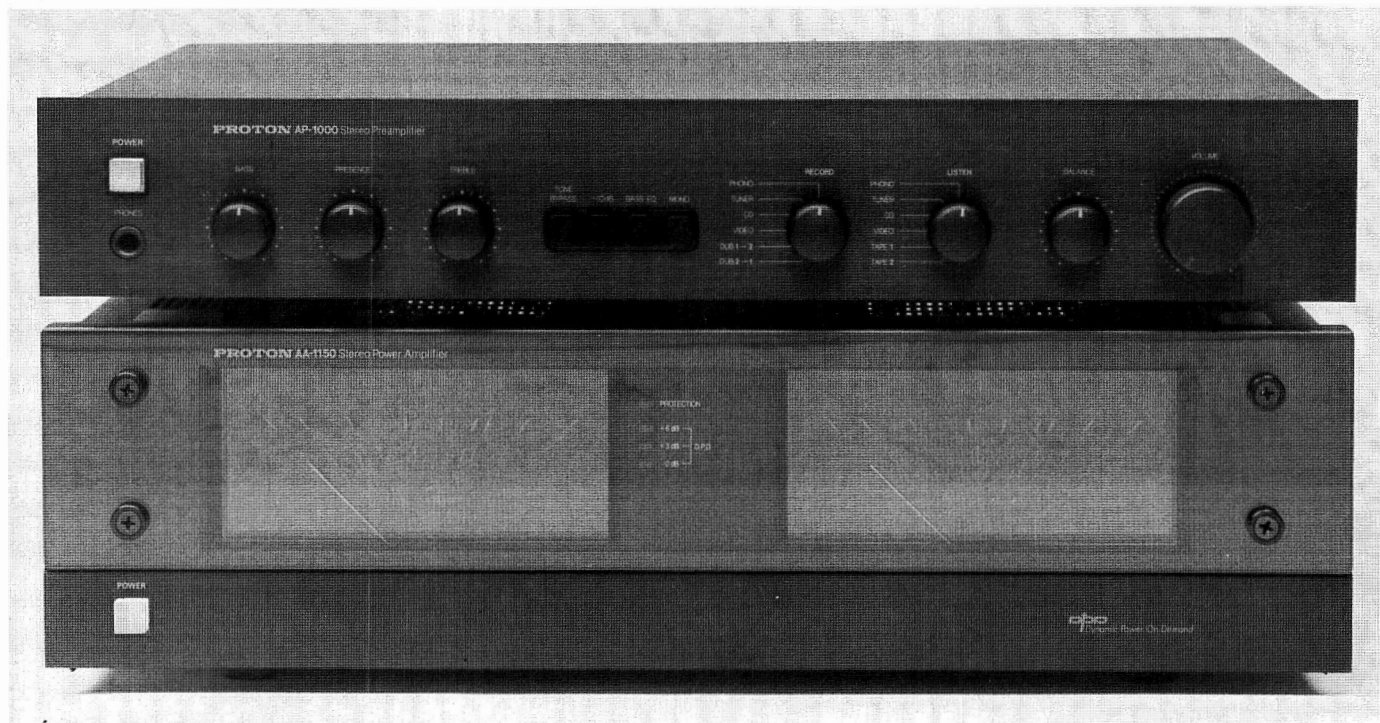
	Aux/CD	MC	
Stereo separation (20Hz)	117.1dB	53.1dB	
	(1kHz) 83.8dB	56.5dB	
	(20kHz) 58.9dB	57.7dB	
Channel balance (0dBV)	0.00dB	0.12dB	
	(-20dBV) 0.43dB	0.03dB	
	(-60dBV) 3.24dB	4.96dB	
	Total har. dist. (0dBV, 1kHz) <-120dB	-97.5dB	
(0dBV, 20kHz) <-110dB	-46.5dB		
CCIR intermod. dist. (1:1) <-110dB	-85.3dB		
Absolute phase			Non-inverting
Phase shift (20Hz)	0°	0°	
(1kHz)	0°	-46°30'	
(20kHz)	0°	-86°20'	
Squarewave linearity			<-110dB
Noise (A wtd, 20Hz-20kHz)	-109.9dB	-65.7dB	
Residual noise (unwtd)	-106.1dBV	-105.4dBV	
Input sensitivity (for 0dBW)	1000mV	682.5µV	
Disc overload (20Hz)		878.5µV	
	(1kHz)	9.189mV	
	(20kHz)	79.85mV	
(50kHz)	148.6mV		
Input loading		10.3kohm/60pF	470ohm/1.2nF
Preamplifier Output (max)/Impedance		13.28V (disc)/1ohm	
Tape Output (max)/Impedance		13.28V (disc)/1ohm	
DC offset, left/right		+35µV/-50µV	
Typical retail price inc VAT		£280 (plus PSU £200)	
POWER AMPLIFIER			
Maximum Continuous	20Hz	1kHz	20kHz
Power Output - 8ohms	59.6W	68.4W	42.9W*
- 4ohms	86.5W	105.7W	70.6W*
Output Impedance	0.041ohm	0.039ohm	0.065ohm
Damping Factor	194.7	207.7	124.1
Stereo Separation (0dBW)	134.3dB	111.7dB	107.7dB

Total Harmonic Dist. (0dBW)	-79.9dB	-75.4dB	-48.9dB
(½ power)	-80.2dB	-83.4dB	-49.6dB
Dynamic Headroom (IHF)		+0.69dB	(80.3W)
Peak Current (5msec, 1% THD)			13.0A
CCIR Intermodulation Distortion (0dBW)			-72.9dB
CCIR IM Distortion (½ power)			-45.9dB
Rise Time (@ 10kHz)			5.5µsecs
Squarewave linearity			-85.5dB
Absolute Phase			Non-inverting
Additional Phase shift 20Hz			+18°
1kHz			0°
20kHz			-18°
Noise (A wtd, 20Hz-20kHz) 0dBW			-93.2dB
(A wtd, 20Hz-20kHz) ½ power			-108.1dB
Residual noise (unwtd)			-79.4dBV
Input Sensitivity (for 0dBW)			73.3mV
(for full output)			606.5mV
Input loading			33kohm/100pF
DC offset, left/right			+39.5mV/-32.7mV
Typical retail price inc VAT			£350



PROTON AP-1000/AA1150

PORTFOLIO MARKETING LTD., 67 NEW ROAD, LITTLE KINGSHILL, GREAT MISSENDEN, BUCKS HP16 0EU. TEL: (0494) 890277.



Now operating through a new UK distribution network, Proton has released a new separates range that culminates in the £650 pre/power combo reviewed here. Struck from the classic Far Eastern mould the £250 *AP-1000* is comprehensively equipped with bass, 'presence' (mid) and treble tone controls, bass eq, mono and a -10dB mute facility. Separate input and record-out controls cater for three line inputs plus two tape decks and both MM and MC phono cartridges. Furthermore, the MC input has alternative gain settings to cope with both high and low output cartridges.

Balance and volume controls complete the feature line-up on the slim black anodised fascia, though further back panel facilities include both subwoofer and high-pass outputs (with 75Hz and 150Hz cut-off frequencies). The internal construction is a little messy but includes two O-cored mains transformers and remote input selection switches.

The matching £395 *AA-1150* power amplifier uses two similar – though significantly larger – power transformers, together with independent L/R regulation for the complementary Sanken output devices. Externally the amp is dominated by two illuminated analogue power meters, each back-lit by a garish green glow and providing some indication of the peak power output into a standard 8ohm load.

Like other Proton amplifiers, the *AA-1150* has proprietary 'Dynamic Power on Demand' (DPD) circuitry, analogous to NAD's 'Power-tracker' theme. The basic concept hinges around the need to provide instantaneous bursts of power to cope with the dynamic demands of music without causing clipping. This is achieved by means of a commutating power supply that switches in a higher current rail to sustain peaks in the output vol-

tage of the amplifier. Momentary power bursts of up to five times the nominal rating may be developed using this technique. However, the duration over which this higher current supply will function depends on both the frequency of the audio signal and its heating effect in the output stage. Momentary bursts of around 200msecs (a fifth of a second) may easily be accommodated before the power supply rails collapse to their normal, continuously rated level.

Three LED's reveal the extent to which the DPD circuit is triggered by musical transients, the final beacon lighting at $+6\text{dB}$ which represents a quadrupling of the power output into a specified load. An adjacent LED serves to warn of protection if a high DC offset is detected at the output, or if too much sustained current is demanded.

LAB REPORT

The claims for Proton's DPD circuit were borne out on test, the amplifier delivering a continuous output of 67W into 8ohms, increasing to 340W under the dynamic IHF conditions. This is equivalent to a fixed-load headroom of $+7.1\text{dB}$, or just under 54V as far as the *AA-1150* is concerned. Under steady-state conditions the power increase from 8 to 40hms was just $+1.9\text{dB}$ but again the 5msec burst test revealed a healthy current delivery of 22.5A (1 per cent THD).

Certain test anomalies did arise, however, most related to the effects of reducing feedback with increasing frequency. Specifically, the output impedance climbed from 0.06ohm at 1kHz to 0.22ohm at 20kHz while THD rose from -109dB (0.00036 per cent) to -82dB (0.008 per cent). This change is barely seen on the rather clean Ultrasonic 3D plot because of an attendant increase in the HF noise floor, the plot revealing traces of

yF_{0-20k} ($y = 2,3$) together with 2nd-order IMD associated with the 2nd harmonic of F_{20k} .

This increase in nonlinearity with frequency was captured by the RF IMD test, however, which shows significant 26dB changes in the 200Hz-20kHz noise floor as a result of RF signals in the 1-60MHz region; the *AA-1150* is also sensitive to RF noise as high as 140MHz, which lead to lesser $+4\text{dB}$ to $+6\text{dB}$ changes in the audible noise floor. A significant $+65^\circ$ phase shift is measured at 20Hz, the possible compound effect of sub-sonic filtering and other poles/zeros at higher frequencies.

Similarly, the *AP-1000* also suffers a high $+54^\circ$ phase shift via both line and disc inputs, indicating that the very irregular MM/MC response may be due as much to imbalances in subsequent line stages as direct errors in the RIAA equalisation accuracy.

One way or another, both disc inputs show a $+1\text{dB}$ boost at 150Hz followed by a -0.75dB cut at 8kHz and an ultrasonic rise to $+3\text{dB}$ at 50kHz. (This latter rise will add a positive phase shift to the overall negative shift imposed by the RIAA filter, resulting in the lower than average negative phase shifts recorded via MM/MC at 20kHz.)

Furthermore, due to the high gain of the disc stage, the quoted disc headroom figures actually refer to the premature overload of a subsequent line stage. For instance the true headroom of the disc stage itself measured some 264mV, or $+34.5\text{dB}$ (at 1kHz), but because of restrictions in the final line output the actual available headroom is reduced to 129mV ($+28.2\text{dB}$)!

Stereo separation, channel balance, input sensitivity and loading are all fine, but the excellent $-104\text{dB}/-91\text{dB}$ A-wtd noise

figures recorded via line and MM inputs deteriorates to -66dB via MC. IMD settles at -81dB to -82dB via all inputs due to non-linearities in the line output stage, while THD increases to -68dB (0.04 per cent) at 20kHz with an input level of 500/50mV (MM/MC). The lower 20mV (MC) composite input used for the 3D plot does not precipitate the same degree of overload, hence the 'cleaner' picture.

SOUND QUALITY

By chance we auditioned this pre/power combination immediately after the NVA system, and were struck by the extra lushness, fluidity and transparency provided. Rich and full in the bass, most tracks enjoyed a fair sense of weight and extension. However, although the sound was full and meaty there was also a suggestion of softness in the lowest octaves. Similarly, vocals seemed expressive enough, though the associated stereo image was considered a little fuzzy about the edges. Strong percussive details were well represented: never obnoxious or unduly bright, a satisfying sense of air and space surrounded the instruments.

Coupled with the delightfully full and deep bass, this made for a very entertaining if slightly 'hi-fi' style of presentation. In the event, this liveliness was described as sounding rather like a mild loudness contour. Although the AP-1000/AA-1150 was not forward or brash in any unpleasant sense, it was perhaps a little too unreserved to do justice to subtler classical works.

Unfortunately this ebullient character was slowed and thickened via the MM disc input. The fullness of the CD input was traded for a syrupy, rich and bloated sound. Vocals were often submerged beneath a tide of softened bass, while top-end clarity and sparkle was diluted, giving a muted if not unpleasant character. The soundstage sounded solid and stable enough, but individual images lacked a sense of tactility or focus.

CONCLUSIONS

The extra headroom made available by Proton's DPD circuit was clearly demonstrated by its handling of powerful dynamic surges. But there is more than this to the making of music. Although it was easy enough to sit back and let the sound wash over us, it was not especially rewarding in an emotional sense. Provided such satisfaction is regarded as less important than straightforward 'welly', the AP-1000/AA-1150 combination is well worth considering, yet in my view the odd technical performance and poor showing via MM/MC vinyl disc must preclude formal Recommendation.

TEST RESULTS

PREAMPLIFIER

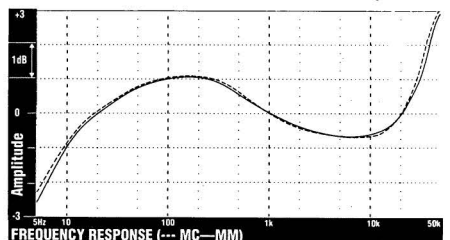
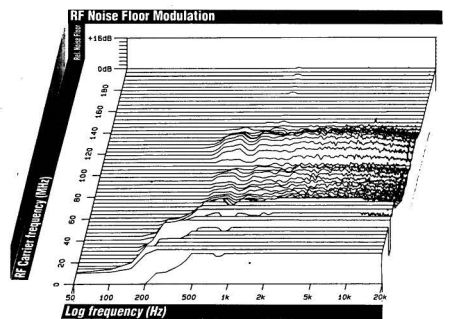
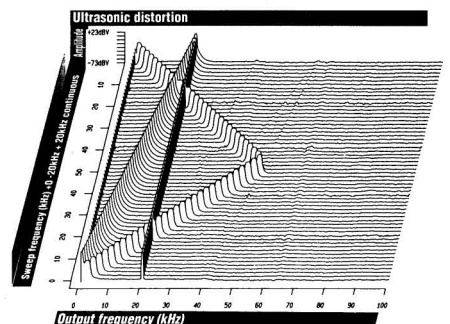
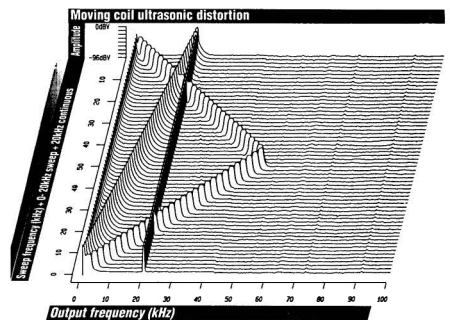
	Aux/CD	MM	MC
Stereo separation (20Hz)	122.5dB	113.8dB	97.6dB
	(1kHz)	112.5dB	102.8dB
	(20kHz)	88.7dB	76.9dB
Channel balance (0dBV)	0.14dB	0.13dB	0.04dB
	(-20dBV)	0.18dB	0.15dB
	(-60dBV)	0.72dB	0.95dB
			1.26dB
Total har. dist. (0dBV, 1kHz)	-102.2dB	-87.9dB	80.2dB
	(0dBV, 20kHz)	-85.7dB	-67.5dB
CCIR intermod. dist. (1:1)	-81.7dB	-81.2dB	-81.0dB
Absolute phase			Non-inverting
Phase shift (20Hz)	+54°	+54°30'	+54°10'
	(1kHz)	0°	-52°30'
	(20kHz)	-12°30'	-68°30'
Squarewave linearity			-104.8dB
Noise (A wtd, 20Hz-20kHz)	-103.5dB	-90.7dB	-66.1dB
Residual noise (unwtd)	-101.1dBV	-101.4dBV	-101.4dBV
Input sensitivity (for 0dBW)	144.3mV	2.485mV	195µV/100.5µV

Disc overload (20Hz)	16.15mV	1.223mV
	(1kHz)	128.7mV
	(20kHz)	1590mV
	(50kHz)	2115mV
Input loading	23.1kohm/490pF	45.7kohm/380pF
Preamplifier Output (max)/Impedance	20.82V (disc)/571ohm	
Tape Output (max)/Impedance	15.34V (disc)/1.03kohm	
DC offset, left/right	0.0mV/0.0mV	
Typical retail price inc VAT		£250

POWER AMPLIFIER

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	61.4W	66.9W	63.8W
- 4ohms	90.3W	102.8W	94.6W
Dynamic Headroom (IHF)		+7.06dB	(339.6W)

Peak Current (5msec, 1% THD)		22.5A
Output Impedance	0.057ohm	0.059ohm
Damping Factor	140.0	136.1
Stereo Separation (0dBW)	119.3dB	110.5dB
Total Harmonic Dist. (0dBW)	-112.7dB	-102.9dB
(½ power)	-109.2dB	-81.9dB
CCIR Intermodulation Distortion (0dBW)		-100.6dB
CCIR IM Distortion (½ power)		-98.6dB
Rise Time (@ 10kHz)		5.1µsecs
Squarewave linearity		-104.3dB
Absolute Phase		Non-inverting
Additional Phase shift 20Hz		+64°40'
1kHz		0°
20kHz		-23°30'
Noise (A wtd, 20Hz-20kHz) 0dBW		-95.6dB
(A wtd, 20Hz-20kHz) ½ power		-109.4dB
Residual noise (unwtd)		-82.6dBV
Input Sensitivity (for 0dBW)		153.9mV
(for full output)		1275mV
Input loading		22kohm/20pF
DC offset, left/right		-1.2mV/0.0mV
Typical retail price inc VAT		£395



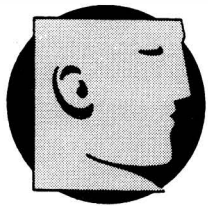
REAL HI-FI COMES TO SOUTH KENSINGTON . . .

The Listening Rooms is London's **newest specialist Hi-Fi shop**, with the principal staff, John Oliver and Paul Tam, having over **thirty years' experience** between them.

Whether you are thinking of spending £300 or £30,000, our aim is always to give the best possible sound within your budget.

We have **two comfortable Listening Rooms** where you can audition Hi-Fi in a relaxed and friendly atmosphere. We offer a full **installation service** and all equipment comes with a **two year guarantee**.

The Listening Rooms is London's **leading multi-room Hi-Fi specialist** and provides a full planning and installation service.



THE listening rooms

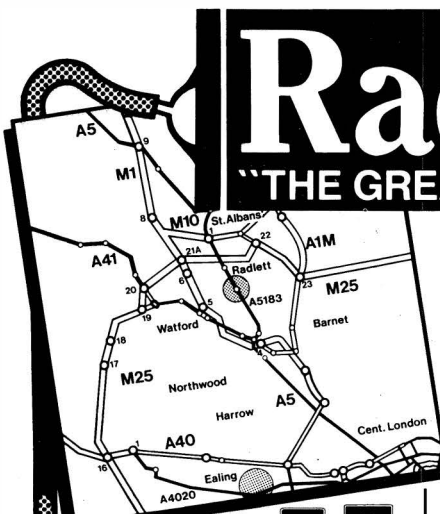
LINN · EPOS · QUAD
 ARCAM · MERIDIAN
 MUSICAL FIDELITY
 MISSION · TANNOY
 MARTIN LOGAN · SME
 AUDIO RESEARCH
 MARANTZ · YAMAHA
 DENON · NAKAMICHI
 ACOUSTIC ENERGY
 SONUS FABER · DUAL
 REVOX · GOLDMUND
 CREEK · KISEKI · VDH
 ROGERS · KOETSU
 MAGNEPAN · TOPTAPE

THE LISTENING ROOMS LTD.,
 161 OLD BROMPTON RD, LONDON, SW5 0LJ.
 TEL: 01-244 7750/59. FAX: 01-370 0192.
 VISA · ACCESS · AMERICAN EXPRESS
 EXPORT AND CREDIT FACILITIES
 Monday - Saturday — 10 am - 6 pm
 Nearest Tube: Sth Kensington or Gloucester Rd

Radlett Audio

"THE GREATEST LITTLE SHOP IN THE COUNTRY"

CONSULTANTS

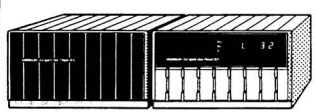


Maybe it's just an opinion (we're too modest to suggest otherwise), but during our 11 years here we have been told many times by importers, manufacturers and customers, that we are "The best little shop in the country." Being small has advantages. Without the vast overheads of a large, flashy shop, we can devote as much time as it takes to ensure our customers get the best for their money, whether it's £5 or £5,000. Furthermore, we are all knowledgeable enthusiasts (not salesmen on commission) with no need to push the most profitable lines. And we never rush, hassle or waffle—we like to keep our customers as friends.

Our demonstration studio is furnished as a sitting room, but stocked with one of the finest ranges of Hi-Fi in the country, including the largest selection of valve amps anywhere. Each and every item is ruthlessly chosen for its sound quality, performance, reliability and value. If it's worth having, we probably stock it and would be delighted to demonstrate why. So, give us a ring or drop in—you'll be very glad you did.

We stock fine equipment from:—
 LINN PRODUCTS • REGA • PROAC • CROFT • AUDIO RESEARCH • VTL • MENTOR • EAR • ORACLE • QUAD
 • INFINITY • KOETSU • MERIDIAN • DENON • AUDIOLAB • SD ACOUSTICS • VOYD • J.A. MICHELL
 • CONCORDANT • AUDIO INNOVATIONS • ROTEL • CAMBRIDGE AUDIO • SNELL • CREEK • EPOS
 • MAGNEPAN • MUSICAL FIDELITY • MONITOR AUDIO • ARCAM • SME
 MARANTZ AND JEFF ROWLAND

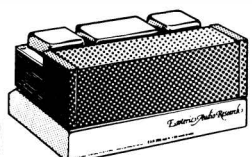
Radlett Audio Consultants
 141 Watling St, Radlett, Herts.
0923-856497
 ALSO AT: Sounds Good,
 147b Uxbridge Road
 Ealing, London W13 9AU
01-579 3963



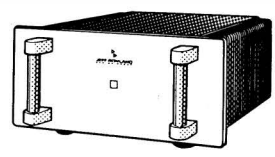
MERIDIAN CD PLAYERS



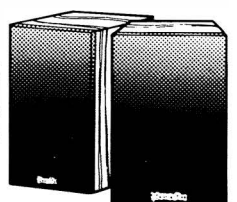
LINN LP 12



EAR 509 MKII



ROWLAND RESEARCH

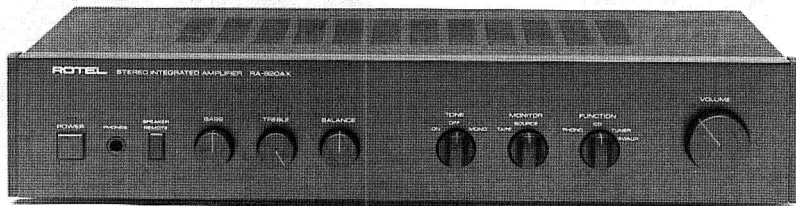


PRO AC TABLETTE

ROTEL RA-820AX

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

BEST BUY



As the direct descendant of Rotel's original market leading budget amplifier, the RA-820AX has an enviable reputation to uphold, a task not undertaken lightly by Rotel's resident 'tweaker', Tony Mills. Since our review of its RA-820A predecessor, the price has increased by £20 to £150, yet there is no visible indication of change. In fact neither the complement of facilities nor the style of the product has changed. Only the use of 6800µF Rubycon electrolytics and a new (quieter and more tightly regulated) E-I power transformer distinguishes the two models. Yet this seemingly mundane 'improvement' has had powerful subjective repercussions.

The matt black alloy fascia is still equipped with matching bass, treble and balance controls, a headphone socket, and remote switching for a second pair of loudspeakers. Inputs are provided for disc (MM only), tuner, CD and aux, together with tape/source monitoring and mono/tone defeat switching.

The disc stage is based on a low-noise NE5532AN op-amp using series-feedback for RIAA equalisation. The line stage also uses an NE5532AN op-amp, while the integral power stage has 12A Sanyo 2SD1047/2SB887 output devices. No Zobel network is employed, a 0.22ohm series resistor guaranteeing stability into any load.

LAB REPORT

Conservatively rated at 30W per channel, our RA-820AX actually managed 47W (one channel driven) with a +1.7dB increase to 69W into 4ohm. Peak current is a healthy 12A while output impedance has been reduced to 0.03-0.04ohm. The DC offset measured a high +50mV on the left channel, but otherwise all was well.

Noise was very low via the CD input (-98dB A-wtd) and a consistent -80dB via MM disc. Similarly, IM distortion was consistent across much of the dynamic range, although a decrease in THD from 0.004 to 0.0011 per cent between 0dBW and 3/4 output is a result of mild crossover effects.

The Ultrasonic 3D plot is very clean, showing just a trace of the 3rd-order route ($F_{20k} - 2F_{0-20k}$) in the audio band together with 2nd harmonics and 2nd/3rd-order summation IMD outside the audio band. RF IMD is

controlled above 20MHz, but there's still room for improvement. The line input sensitivity is a fairly high 190mV, but 3.1mV MM sensitivity is proportionally on the low side. The vinyl disc eq response is nicely controlled: flat from 100Hz-10kHz, with an LF roll-off -3dB point of 11Hz.

SOUND QUALITY

Impressed by the rich, weighty and very spacious sound, our listeners were easily fooled into believing it was a multi-hundred pound product. Like many of its stablemates, the 820AX had an inky black background. There was the merest hint of congestion in the upper bass, but the mid and treble remained very smooth and very musical.

The dynamics of individual instruments were preserved in a way unmatched by the immediate competition, our listeners constantly referring to the wondrously spacious but - more importantly - realistic nature of the reproduced sound. Music breathed out from the speakers in a captivating but wholly unforced fashion. Indeed, the character of this amplifier was frighteningly close to recapturing the 'magic' of the PDM sound source itself.

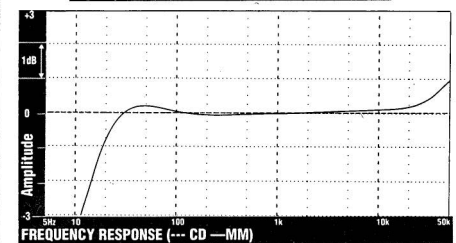
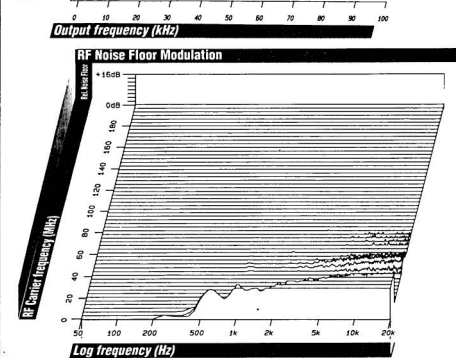
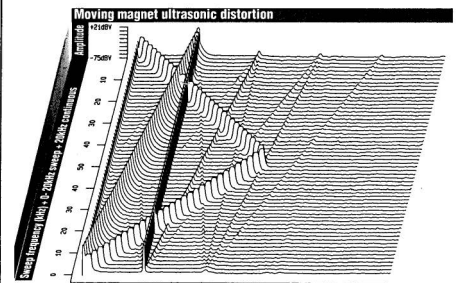
This same delightful openness and freedom from compression was still apparent via the MM input. The sound was less lush, but remained very realistic and vivid nevertheless, one listener commenting that, compared to its immediate competition, a layer of 'hash' had been removed.

CONCLUSIONS

Every once in a while, a new amplifier emerges which utterly redefines my hi-fi expectations of hi-fi at a particular price point. As far as this test group is concerned, that model is the RA-820AX. Clearly Rotel's best budget amplifier to date, it represents fierce competition in the sub-£200 sector of the market.

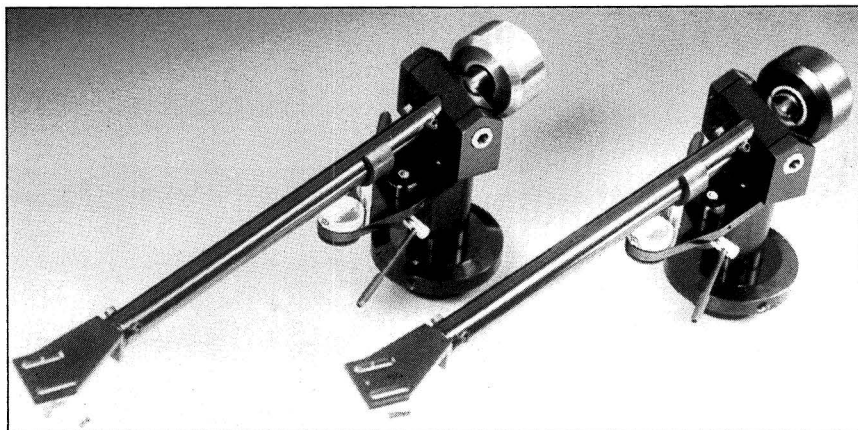
TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	43.4W	47.0W	46.0W
- 4ohms	59.7W	69.3W	67.2W
Dynamic headroom (IHF)		+1.35dB (64.2W)	
Peak Current (5msec, 1% THD)			12.0A
Output impedance	0.033ohm	0.038ohm	0.040ohm
Damping factor			198.9
	CD/Aux	MM	MC
Stereo separation (20Hz)	99.8dB	74.6dB	
(1kHz)	71.4dB	70.7dB	
(20kHz)	46.0dB	44.7dB	
Channel balance (-20dBV)	0.66dB	0.67dB	
(-60dBV)	3.15dB	2.88dB	
Total harmonic dist. (0dBW)	-88.7dB	-88.7dB	
(2/3 power)	-98.0dB	-99.0dB	
CCIR intermod. dist. (0dBW)	-85.6dB	-80.9dB	
CCIR IM dist. (2/3 power)	-87.3dB	-80.9dB	
Phase shift (20Hz)	+21°30'	+25°30'	
(1kHz)	0°	-47°55'	
(20kHz)	-11°12'	-82°50'	
Noise (A wtd, 0dBW)	-87.4dB	-79.6dB	
(2/3 power)	-97.7dB	-80.2dB	
Residual noise (unwtd)	-72.7dBV	-72.6dBV	
Input sensitivity (for 0dBW)	27.60mV	445.5µV	
(for full output)	191.1mV	3.065mV	
Disc overload (20Hz)		23.21mV	
(1kHz)		200.9mV	
(20kHz)		1630mV	
(50kHz)		3679mV	
Rise time			2.1µsecs
Squarewave linearity			-105.1dB
Absolute phase			Non-inverting
Tape output/impedance		12.76V (disc)/2.0kohm	
Input loading		50.5kohm/90pF	47.5kohm/140pF
DC offset, left/right		+50.1mV/+30.7mV	
Typical retail price inc VAT			£150



SOUND DEALS

52-54B SHORTMEAD STREET, BIGGLESWADE BEDS SG18 0AP • Tel: (0767) 312249 • Fax: 315714



ALL MANTICORE PRODUCTS ON PERMANENT DEMONSTRATION

"Manticore can be proud of this tonearm. It is well conceived, very well built and extremely well finished arguably setting standards at this price point"

Hi-Fi Answers – September 1989

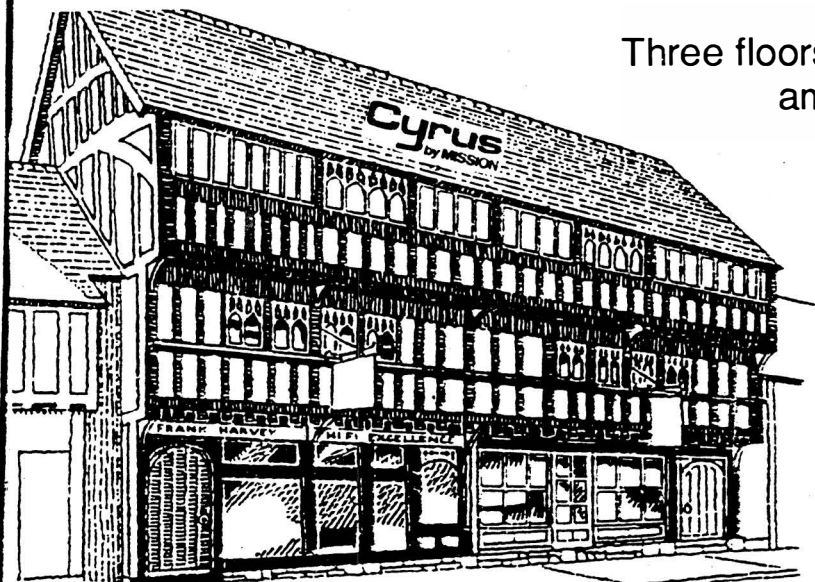
BECAUSE OF OUR CLOSE PROXIMITY TO MANTICORE WE ARE ABLE TO OFFER ANY WALNUT, BLACK OR MAHOGANY TURNTABLE/ARM COMBINATION, FAST MAIL ORDER SERVICE ON ANY MANTICORE PRODUCT

STOP PRESS: The amazing new MANTICORE MAGICIAN Tonearm now on Demonstration. Glued armtube, Swiss Abec 7 bearings, VdH wiring, superb silver finish. Let the MAGICIAN weave its magic spell on your turntable, £440.00, and in our opinion worth double!

Part-exchange welcomed ★ wide range of previously owned equipment ★ Two single speaker demonstration rooms ★ Delivery & installation ★ Rega arms VdH rewired ★ Rotel RC850 and RC870 Preamps upgraded ★ Complete LP collections purchased ★ Custom built Aerolam and MDF support platforms ★ Specialists in Professional Audio/Visual systems ★ All usual dealer facilities.

SAE OR TELEPHONE FOR LATEST NEWSLETTER WITH DETAILS OF ALL THE ABOVE & SECONDHAND LIST

FRANK HARVEY HI-FI EXCELLENCE



Three floors of carefully selected hi-fi amidst the eloquence of our 14th century showroom.



3 FLOORS - 3 SINGLE SPEAKER DEMONSTRATION ROOMS
3000 SQ FEET IN THE PURSUIT OF HI-FI EXCELLENCE.

NICE
STAFF

(0203) 525200



BECAUSE PEOPLE LIKE MUSIC.
FRANK HARVEY

HI-FI EXCELLENCE
163 MEDIEVAL SPON STREET
COVENTRY CV1 3BB

MUSICAL
FIDELITY



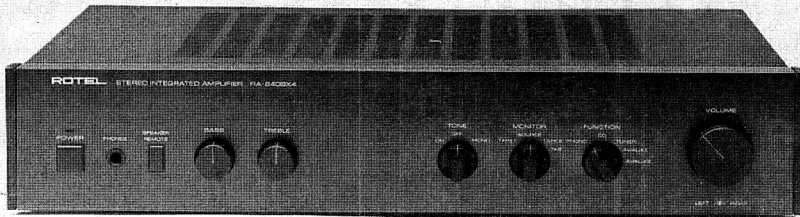
NICE
COFFEE

(0203) 525200

ROTEL RA-840BX4

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

RECOMMENDED



Over the past year Rotel has been improving the performance of its 'Recommended' RA-840BX3, a process which culminates in the BX4 reviewed here. Visually the two amplifiers are identical, but the update brings a price increase of £30. The same passive bass/treble tone controls are fitted, together with the customary dual-concentric volume control. Likewise, input selection covers up to four line sources, alongside facilities for either both MM or MC cartridges, selected by a switch on the rear.

So any metamorphosis has taken place within the amplifier. The PCB is completely re-laid and is now wholly symmetrical from the vinyl disc stage right through to power amplifiers. The board itself is now a polymer rather than compressed paper. Separate rectifiers and smoothing caps are now used for the voltage gain and power output stages, reducing 50Hz and 100Hz noise.

Signetics NE5534AN op-amps are still used in the vinyl disc gain and shunt-feedback eq stages, just as the same 12A Sanyo B817/D1047 transistors are employed in the output section. However, Apycaps now replace the tantalum interstage coupling caps, and the Siemens layer caps have been superseded by the excellent Rubycon (Black Gate) BGF electrolytics in the signal path.

LAB REPORT

Compared to the earlier BX3, power output has inched up by 3 or 4W to 63W into 8ohms and 102W (+2.1dB) into 4ohms, but the current delivery into lower impedances shows a large increase in distortion. Typically 1-2 per cent THD was measured during the peak current test, but the high quoted 18A represents the symmetric hard clip point.

Stereo separation has deteriorated slightly to 62-63dB midband, while poor tracking tolerances in the volume control have led to a high 10-12dB error in channel balance at -60dBV. A-wtd noise is also fractionally higher via all inputs, though the residual (unwtd) LF noise has improved by some 6-7dB to just -64dBV.

Still in the 0.032-0.008 per cent region, distortion is now very much more consistent from input to input, implying that the linearity of the vinyl disc network has been slightly

improved. That said, headroom has fallen slightly to +31.5dB (MM), while sensitivity has decreased from 2.7mV to 3.2mV for full output. The MM/MC disc equalisation has not changed and is still extremely well balanced, delivering a flat response from 100Hz-50kHz and rolling-off to a sensible LF -3dB point of 10Hz.

SOUND QUALITY

Our first impressions were not entirely favourable; there seemed to be a slight loss in stereo focus and a smearing of strong vocal material. However, it transpired that the BX4 was particularly sensitive to absolute phase (depending on the qualities of the speaker of course). Reversing the speaker leads (and so returning the output to positive phase) brought an immediate and quite startling improvement in clarity, detail resolution and the sharpness of individual stereo images.

The amplifier still had a very easy-going and typically 'British' sound, with a very sedate and refined style of presentation that contrasted with Musical Fidelity's seat-of-the-pants offering, for instance. The soundstage was not as broad and deep as that found with the 820AX, but it was similarly 'quiet' and 'dark' in texture.

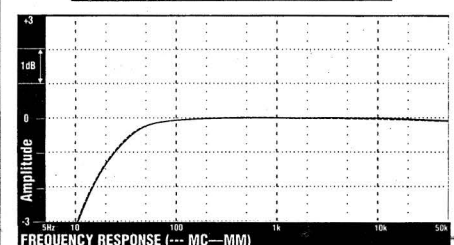
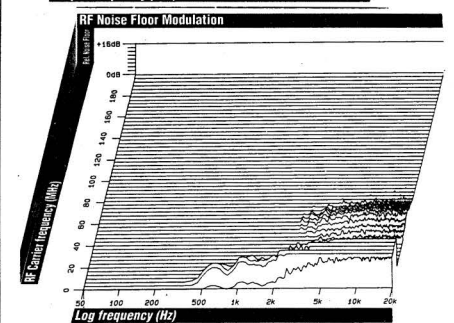
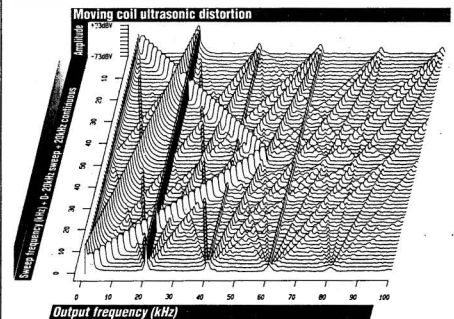
However, there was no doubt that the BX4 possessed more neutral and accurate balance than its cheaper cousin, coupled with a greater command over musical dynamics.

CONCLUSIONS

Simple instrumental melodies conveyed a fine sense of atmosphere and occasion, although a little of this air and freedom was lost with more complex recordings. However, bearing in mind the very measured and civilised quality of both line and disc inputs, this is a very minor blot on an otherwise improved copybook. Indeed, the RA-840BX4 is the type of amplifier you would buy to forget about the equipment, and simply sit back and listen to the music.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	57.5W	62.9W	57.0W
- 4ohms	88.4W	102.3W	93.2W
Dynamic headroom (IHF)		+0.89dB	(77.2W)
Peak Current (5msec, 1% THD)			18.3A*
Output impedance	0.052ohm	0.053ohm	0.058ohm
Damping factor	153.0	152.3	137.5
	CD/Aux	MM	MC
Stereo separation (20Hz)	92.9dB	95.6dB	76.3dB
(1kHz)	62.6dB	62.9dB	62.4dB
(20kHz)	37.5dB	37.3dB	37.4dB
Channel balance (-20dBV)	0.30dB	0.30dB	0.35dB
(-60dBV)	10.8dB	12.4dB	12.8dB
Total harmonic dist. (0dBW)	-82.1dB	-81.9dB	-77.8dB
(½ power)	-70.9dB	-70.6dB	-70.7dB
CCIR intermod. dist. (0dBW)	-77.1dB	-76.5dB	-75.7dB
CCIR IM dist. (½ power)	-75.2dB	-74.8dB	-73.2dB
Phase shift (20Hz)	+6°20'	+30°30'	+30°0'
(1kHz)	0°0'	-47°40'	-48°0'
(20kHz)	-8°40'	-90°0'	-90°0'
Noise (A wtd, 0dBW)	-77.7dB	-76.7dB	-67.6dB
(½ power)	-91.2dB	-84.7dB	-68.3dB
Residual noise (unwtd)	-64.0dBV	-63.8dBV	-64.2dBV
Input sensitivity (for 0dBW)	25.75mV	407.8mV	43.4µV
(for full output)	205.9mV	3.236mV	344.2µV
Disc overload (20Hz)		24.0mV	2.531mV
(1kHz)		188.5mV	20.21mV
(20kHz)		1795mV	192.4mV
(50kHz)		1848mV	199.6mV
Rise time			1.0µsecs
Squarewave linearity			-96.0dB
Absolute phase			Inverting
Tape output/impedance		11.90V (disc)/1.12kohm	
Input loading	45.6kohm/140pF	47kohm/175pF	180ohm/1.2nF
DC offset, left/right			-47.5mV/-26.9mV
Typical retail price inc VAT			£249



ON DEM IN KENT

Superb equipment from:- Michell, Voyd, Systemdek, Townshend, Kuzma, Rega (arms only), Helius, SME, Audionote, Goldring, Koetsu, Kiseki, Milltek, Ortofon, Decca, Audio Innovations, Rose Industries, Audion, Audio Technica, Quicksilver, Kelvin Labs, Albarry, Sugden, Proac, TDL, Glastonbury, Snell, Spica, JPW, Celef, Alexander, Ruark, Marantz, Alphason, Supra, Kimber, Vecteur, QED, Target, Pirates Cardas Cable.

ON DEM EXCLUSIVELY IN KENT

Conrad Johnson valve and solid state amps and CD player, Raymond Lumley valve monobloks, Oakley pre-amps and Cardas Cable.

ON DEM EXCLUSIVELY IN THE UK

Sound-Lab full electrostatic and hybrid loudspeakers.

PROGRESSIVE AUDIO



Situated 5 minutes off the M2 near Rainham, Kent, we offer first class no obligation dems here or in the more realistic environment of your own home.

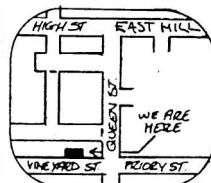
PHONE DAVE ON 0634-389004

HIGH FIDELITY AUDIO SYSTEMS BY...



- ★ SEPARATE DEMONSTRATION LOUNGE
- ★ DELIVERY & INSTALLATION SERVICE
- ★ INTEREST FREE CREDIT
- ★ THE VERY BEST OF BRITISH & JAPANESE EQUIPMENT

LINN PRODUCTS · NAIM AUDIO · REGA · CREEK · ION SYSTEMS · ARCAM · ROYD · REVOLVER · MONITOR AUDIO · EPOS · HEYBROOK · ROTEL · DENON · SONY ES · RUARK · AUDIOLAB · MERIDIAN · NAKAMICHI · THE SOUND ORGANISATION · THE CHORD COMPANY · CAMBRIDGE AUDIO · AUDIOTECH · THAT'S



**6 VINEYARD STREET
COLCHESTER TEL: 577519**

Simply Better Hi-Fi

Denon, Rotel, Dual, JPW, Creek, Monitor Audio, Musical Fidelity, Rogers, Quad, KEF, Audiolab, Mordaunt Short, Yamaha, Cambridge Audio, Celestion, Systemdeck, Ruark, Nakamichi, Marantz, Revox, Acoustic Energy, Roksan, Krell, Audio Research, Magneplanar, JBL

**SONY
HI-FI
NEWS
&
RECORD REVIEW**

**DEALER AWARDS
1989
REGIONAL NOMINEE**

*Steve
Boxshall*
AUDIO

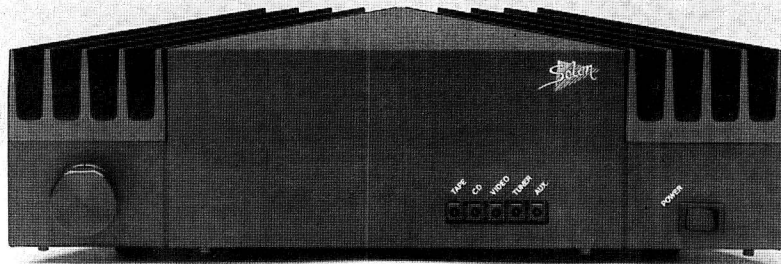
BADA
THE ULTIMATE IN
SOUND ADVICE

A MEMBER OF BADA

41 VICTORIA ROAD, CAMBRIDGE: (0223) 68305

SOLEN TIGER B50

THE FINAL UPGRADE, SUITE 1, 48 SOMERSET RD., NEW BARNET, HERTS EN5 1RG. TEL: (01) 440 2588.



If the British have established something of a reputation for utilitarianism in hi-fi design, so our continental cousins have often tended to build a little more visual flair into their creations. The *Tiger B50* integrated amplifier is a good example. Manufactured by Solen in France, it is fashioned into the shape of a triangle, albeit with a truncated apex at the rear to provide space for the input phono sockets and 4mm speaker outlets.

The matt black fascia has a simple volume control and a bank of five logic-controlled input select buttons, each with an inset LED. Tape, CD, video, tuner and aux sources are accommodated on the basic model, with small encapsulated relays facilitating the input switching. An optional *PA2* module is available for vinyl disc replay. This connects to the 'aux' input and is powered via an umbilical which links to special outlet on the amplifier.

The *Tiger* is divided into two parallel sections, the top half being occupied by a large toroidal mains transformer and upward-facing heatsinks. The lower half contains the main PCB, 2x10,000µF reservoir caps and 25A (125W) *TIP35/36C* output transistors that are clamped to the underside of the heatsink. However, this is in fact a valve/transistor hybrid amplifier, since Solen has elected to use two *ECC81* double-triodes in a shunt-regulated push-pull configuration at the input.

LAB REPORT

One might expect the level of THD (0.47 per cent) and IMD (0.35 per cent) to be dictated by the valve input stage, yet as these distortions vary with power level they most probably originate with the transistorised output stage! The high-ish 0.13ohm output impedance is a further indication of a minimum-feedback design (unless of course there is a series resistor at the output), as is the restricted power bandwidth.

Our first sample delivered 45W into 8ohms with a rise of +2.0dB to 71W into 4ohms. However, high frequency power output is much less impressive: the 40W quoted for 20kHz actually represents the hard-clip point, for 2-4 per cent THD was measured at all lower power levels.

The 3D plot was taken with a 'revised' version of the *Tiger B50*, but still shows high levels of THD and IMD, fortunately dominated by pleasant-sounding low-order mechanisms. $yF_{20k} - yF_{0-20k}$ [$y = 1,2$] represents the most immediately audible distortions, while RF IMD is restricted to mild +4dB breaks at 68 and 95MHz.

SOUND QUALITY

Though lacking its optional disc input on this occasion, the Solen *Tiger* had a number of our listeners enthralled with its line-only performance. Replaying simple vocal material, the *B50* revealed bags of ambient detail in a very fluid and unhurried fashion. Vocals seemed to breathe from the loudspeakers with reassuring presence and tactility. The potentially beautiful sound of the PDM converter used in our test set-up was found in full flow - richly melodic and seductively musical.

Yet there was a downside to the *Tiger* too, in particular a slight softness in the bass, plus a very faint smearing of detail at higher frequencies. These detractions were more or less evident depending on the choice of source material. Regardless of whether pop or classical music was chosen, the sound simply became progressively more confused and 'shut-in' when faced with increasing complexity and wide dynamic contrasts.

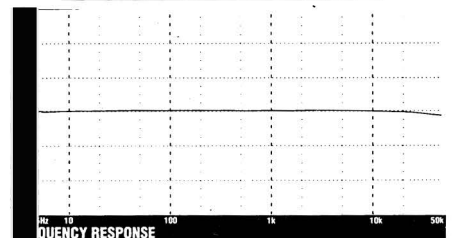
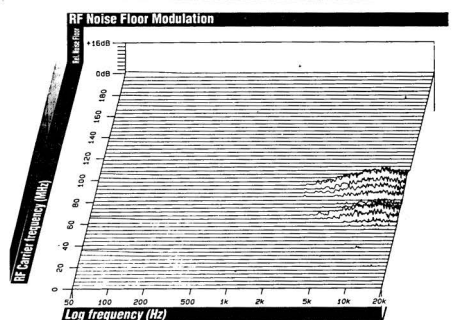
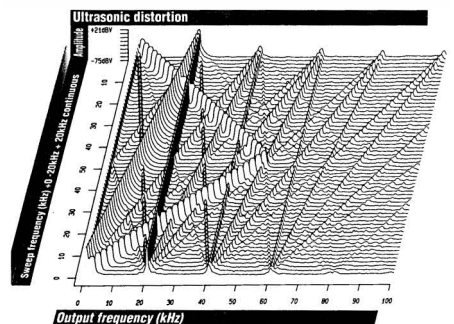
At its best the *Tiger* had the power to captivate listeners with a deliciously articulate and revealing midband, projecting the most powerfully emotive vocals within an uncannily deep and broad soundstage. These qualities alone could prove irresistible.

CONCLUSIONS

Technically and subjectively the *Tiger B50* proved to be idiosyncratic. If only the superb transparency enjoyed with simpler recordings could have been maintained with more demanding tracks. Brilliant in places, and visually a delight, it is certainly well worth considering by enthusiasts who are prepared to tolerate its foibles and don't mind the £870 price tag. In a carefully matched system it could doubtless be made to sing.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	42.7W	45.0W	40.0W*
- 4ohms	66.8W	70.6W	63.2W*
Dynamic headroom (IHF)			+0.86dB (54.9W)
Peak Current (5msec, 1% THD)			12.1A
Output impedance	0.132ohm	0.128ohm	0.148ohm
Damping factor	60.8	62.9	54.1
	CD/Aux	MM	MC
Stereo separation (20Hz)	80.3dB		
(1kHz)	80.4dB		
(20kHz)	52.6dB		
Channel balance (-20dBV)	0.15dB		
(-60dBV)	0.06dB		
Total harmonic dist. (0dBW)	-62.2dB		
(½ power)	-46.5dB		
CCIR intermod. dist. (0dBW)	-57.0dB		
CCIR IM dist. (½ power)	-43.1dB		
Phase shift (20Hz)	+7°0'		
(1kHz)	0°		
(20kHz)	-35°30'		
Noise (A wtd, 0dBW)	-71.6dB		
(½ power)	-98.8dB		
Residual noise (unwtd)	-54.3dBV		
Input sensitivity (for 0dBW)	47.15mV		
(for full output)	322.7mV		
Rise time			3.5µsecs
Squarewave linearity			-67.8dB
Absolute phase			Non-inverting
Tape output/impedance			>16V (disc)/35ohm
Input loading			24kohm/80pF
DC offset, left/right			+1.5mV/-2.3mV
Typical retail price inc VAT			£870



	ROCK		KEF	
RUARK		MISSION CYRUS		TEAC
M. A	MERIDIAN		NAKAMICHI	A. T
	ROTEL	TECHNICS		REVOLVER
ITL	PIONEER		KENWOOD	ION

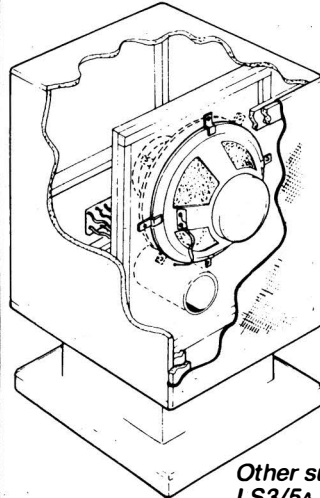
▲

CAMBRIDGE

31 ST.	HI-FI	1-3
CUTHBERTS STREET BEDFORD		HAWTHORN WAY CAMBRIDGE
0234-325035		0223-67773

SPP SUBWOOFER

The Wilmslow Audio SUPER PUSH PULL subwoofer can be connected directly into systems using medium/large speakers (typically 89 - 91 dB sensitivity) and needs no extra amplifier. Using two special 12" (18hz resonance) sub-bass drive units it achieves remarkable results from an enclosure of only 673 x 385 x 432mm (26½ x 15 x



17in.). The Super PP kit includes drive units, high/low pass crossovers, grille fabric, reflex port, binding post connectors, Flatpack cabinet kit (inc. stand) accurately machined from smooth MDF. Easy assembly - no woodworking or electronic skills required! Suitable for amplifiers of 40 - 200 watts per channel.

PRICE £217 inc. VAT
plus carr/ins £15

*Other subwoofers available to match
LS3/5A, QUAD E.S., SL600, etc. etc.*



Telephone credit card orders



WILMSLOW AUDIO LTD

Wellington Close, Parkgate Trading Estate
Knutsford, Cheshire WA16 8DX Tel: 0565 50605

(Closed all day Mondays)

DIY Speaker Catalogue £1.50 post free (export £3.60)

*As a cat of some discernment,
Rupert's choice of Chew & Osborne
for the very best audio-visual
equipment - and excellent service -
was most fortuitous.*

Chew & Osborne

HI-FI · TELEVISION · VIDEO
COMPACT DISCS · CASSETTES

... sounds outstanding



SONY TA-F730ES

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



A flagship product if ever I saw one, Sony's *TA-F730ES* is possibly the heaviest if not the largest integrated amplifier on the UK market today. The metal casework and huge brushed-alloy fascia account for little of the weight, however, since the unit is built on Sony's proprietary *Gibraltar* chassis – a massy and acoustically 'dead' material used for a number of *ES* models. The material itself is not metal but a moulded mineral and fibre-loaded polyester resin, that forms the base of the unit.

A huge mains transformer adds further to the mass and feeds separately regulated supplies for the voltage-gain and main power output sections. The latter uses two pairs of Sanken *A1186/C2837* bipolar transistors per channel, mounted on the underside of a huge cast alloy heatsink alongside complementary pairs of NEC drivers.

The front of the amplifier is dominated by a huge rotary volume knob and three supplementary controls for pre-out and A/B speaker selection, normal/adaptor mode and input selection.

Up to three tape-decks, two other line sources and both MM and MC cartridges are accommodated, with full and independent record-out selection.

The bass and treble tone controls feature variable turnover frequencies, while the MC vinyl disc input has the extra flexibility of 40 and 3ohms loading options. Mono/stereo, source-direct, balance, muting and subsonic filtering complete the comprehensive line-up of facilities.

LAB REPORT

This amplifier's main claim to fame is its fabulous closed-loop linearity, THD falling as low as 0.0003 per cent and CCIR-IMD as low as 0.0006 per cent at two-thirds output. This is reflected in the remarkably 'clean' 3D plot, a result which is made all the more impressive in the light of recent (harsher) revisions to the test itself. All that can be seen are traces of 2nd and 3rd-order IM products derived from F_{20k} and its 2nd harmonic.

Unfortunately the *730ES* is less linear under open-loop conditions, as indicated by the RF IMD plot. Noise is exceptionally low via CD and MM vinyl disc inputs, sensitivities

and loading are fine and the disc headrooms are an acceptable +29.8dB and +26.0dB respectively.

The RIAA eq responses for MM and MC are absolutely flat from 100Hz-20kHz, deviating by just 0.6dB at 10 Hz. However, the negative 20Hz phase shifts are very unusual.

Power output is reassuringly 'stiff', the 133W into 8ohm increasing by a fine +2.2dB and 219W into 4ohm. Only the 16.7A peak current is a little disappointing (V/I limiting).

SOUND QUALITY

Our listeners felt that the *TA-F730ES* sounded comfortably solid via CD without digging unnecessarily deeply into the bass. Its presentation was very stable and coherent, even a trace of smearing with strong percussive notes did not disturb to the point of fatigue. The midband was as transparent and controlled as the bass, and although vocals often sounded a trifle matter-of-fact they were nevertheless articulate and easy to discern.

This unwavering sense of control and surety was retained through the vinyl disc input, which delivered a solid bass line, a clear and open midrange and a slightly dry but detailed treble.

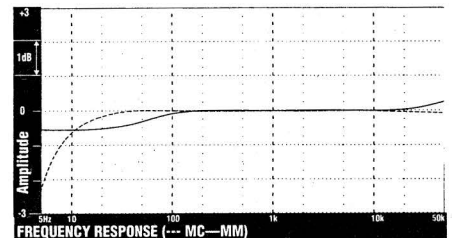
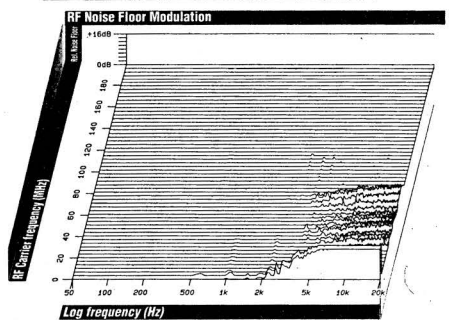
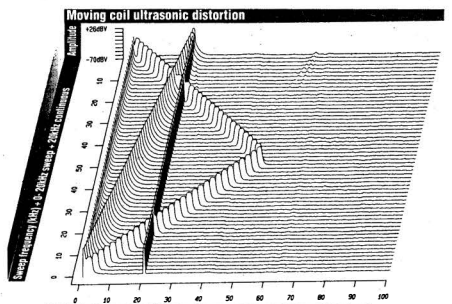
It is difficult to criticise the powerful grip exercised by this amplifier, yet its very real failing does not concern any particular facet of its performance but rather an overall 'feeling' of detachment. Ultimately, it was thought that the *730* had a slightly cool and dispassionate approach to the task of music making.

CONCLUSIONS

Difficult to censure on the grounds of its superb objective performance, the *TA-F730ES* nevertheless left us feeling emotionally unfulfilled. Music was reproduced with great technical accuracy and in a very stable manner, unruffled by complex dynamic inflections for instance. But there was the impression of too much control, too much authority. This in turn diluted the vitality and magical spark possessed by imaginative recordings, a quality that surely compromises the value of this expensive amplifier.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output – 8ohms	134.3W	133.0W	129.0W
– 4ohms	215.9W	218.5W	215.2W
Dynamic headroom (IHf)		+1.14dB	(172.9W)
Peak Current (5msec, 1% THD)			16.7A
Output impedance	0.066ohm	0.066ohm	0.090ohm
Damping factor	120.8	121.1	89.0
Stereo separation (20Hz)	CD/Aux 93.4dB	MM 98.2dB	MC 97.7dB
(1kHz)	59.6dB	59.8dB	59.2dB
(20kHz)	34.0dB	34.0dB	34.4dB
Channel balance (–20dBV)	0.25dB	0.31dB	0.39dB
(–60dBV)	1.19dB	1.15dB	1.13dB
Total harmonic dist. (0dBW)	–102.4dB	–100.6dB	–95.7dB
(½ power)	–110.4dB	–104.5dB	–96.7dB
CCIR intermod. dist. (0dBW)	–95.8dB	–90.6dB	–90.1dB
CCIR IM dist. (½ power)	–98.5dB	–92.5dB	–91.6dB
Phase shift (20Hz)	0°	–18°20'	–5°30'
(1kHz)	0°	–49°10'	–49°10'
(20kHz)	–4°30'	–76°20'	–83°10'
Noise (A wtd, 0dBW)	–83.7dB	–81.4dB	–70.7dB
(½ power)	–95.5dB	–91.0dB	–71.5dB
Residual noise (unwtd)	–77.3dBV	–77.5dBV	–77.3dBV
Input sensitivity (for 0dBW)	10.15mV	253.4µV	16.95µV
(for full output)	182.8mV	2.939mV	179.5µV
Disc overload (20Hz)		17.47mV	1.085mV
(1kHz)		154.8mV	9.960mV
(20kHz)		141.7mV	93.59mV
(50kHz)		2665mV	161.9mV
Rise time			450nsecs
Squarewave linearity			–107.5dB
Absolute phase			Non-inverting
Tape output/impedance		9.588V (disc)/1.23kohm	
Input loading	54.8kohm/190pF	46kohm/370pF	970 & 99ohm
DC offset, left/right		–5.7mV/+11.6mV	
Typical retail price inc VAT			£450



SUMO ATHENA/POLARIS

ATC, GYPSY LANE, ASTON DOWN, STROUD, GLOS. GL6 8HR. TEL: (028576) 561.



Despite the oriental name, Sumo products are designed and manufactured in the USA. These amplifiers form the core of a range that includes two other power amps, a variety of loudspeakers and a digital tuner. Founded by a group of enthusiasts, the origins of Sumo Products can be traced back to an earlier audiophile outfit called GAS, or Great American Sound. Perhaps by adopting a distinctly Japanese brandname, Sumo hopes to achieve in the Far East what Pioneer, Kenwood and others have achieved in the States!

Whatever the marketing platform, the *Athena* preamplifier and *Polaris* power amplifier have been designed with value in mind, and with the intention of providing both flexibility and a standard of sound quality that can compete with much of the so-called 'High End'.

Athena is equipped with three matching rotary controls, the most important being a dual-concentric volume/balance control based around a very high quality sealed Noble potentiometer (just look at the channel balance figures). This is complemented by independent input and record-out selection, catering for three line inputs, two tape decks and either MM or MC cartridges.

Each selection is confirmed by a yellow LED on the slim fascia, though the MM/MC cartridge option must be selected using an internal switch. This alters the input loading and introduces an earlier gain stage to raise the lower output of an MC cartridge to that required by the subsequent MM/RIAA stage.

Sumo uses matched *MAT-02* differential gain blocks in the MC headamp, each stabilised by local resistive feedback. This is followed by a wholly discrete double-differential gain stage in the ensuing RIAA eq section. In fact the preamplifier uses discrete and dual-mono construction techniques throughout,

save for the use of a single toroidal mains transformer.

Metal-film resistors and metallised polypropylene capacitors are used at specific points in the audio path. A series of LEDs are used for biasing the discrete current sources applied after the volume control but prior to the main high-current line output stage; this section is removed from the signal path when used in 'bypass' mode.

Similar care has been taken in the design and construction of the *Polaris* power amplifier, though the two units hardly make a good aesthetic match. Large grab-handles emerge from the edges of the black fascia, affording at least some protection from the quoted 600 square inches of heatsinks. Inside this 12kg package Sumo uses Class A differential pre and complementary driver stages to feed two pairs of matched *2SJ115/2SK405* MOSFETs per channel.

A minimum overall 25-30dB of negative feedback is used, while a proprietary compensation servo operates about the final output to linearise the transconductance of the FETs; this compensation does not appear to encompass the mild Zobel network.

LAB REPORT

Having already tested a sample of this pre/power combination some nine months ago, it's interesting to note certain objective changes that have occurred in the interim. For instance, *Polaris'* output has remained at a healthy 128W into 8ohms and 212W (+2.2dB) into 4ohm, but the output impedance has risen from 0.0084ohm to 0.028ohm at 20Hz. Its Peak current capability registered a healthy 29.9A (1 per cent THD) and stereo separation a fabulous 120-130dB mid-band.

More interesting is the fact that THD,

which previously hovered between -75dB and -79dB ($\frac{2}{3}$ output), was now down to -95dB (0.0018dB per cent) below 2kHz, but climbed close to its earlier value of -76dB (0.016 per cent) at 20kHz. Furthermore, CCIR IMD was now reduced from -81dB to an exceptionally low -99dB (0.00056 per cent). Changes either in the selection of the output MOSFETs or in the compensation servo would account for these differences.

A trace of the 2nd harmonics ($2F_{0-20k}$ and $2F_{20k}$) are seen on the 3D Ultrasonic plot, but the strongest mechanism appears to be 2nd-order summation IMD, given by $F_{20k} + F_{0-20k}$. Very low level secondary IM products ($2F_{20k} + yF_{0-20k}$, $y = 1,2$) are revealed towards the right hand side of the plot.

The matching *Athena* preamplifier has a very similar and certainly very complementary range of 2nd-order distortions. In this case, however, it is the difference product ($F_{20k} - F_{0-20k}$) that dominates, increasing with decreasing frequency as a function of the moving coil RIAA curve.

Sumo has engineered a slight (0.75dB) lift to the response of the disc stage above 10kHz, reducing the phase lag to -83° at 20kHz. Very little additional phase shift is suffered by either pre- or power amp, in fact, though the subjective relevance of this is uncertain.

THD and IMD remain unchanged as far as *Athena* is concerned, increasing from 0.0012 per cent at 20kHz on the CD input to 0.042 per cent via the MC vinyl disc input. IMD also increases to -58dB (0.063 per cent) via the MC stage, a reflection of both its high sensitivity (44µV in for 1V out) and lower headroom.

SOUND QUALITY

Our listeners were captivated by the sound of

this pre/power duo, comparing it favourably to the Exposure XI/VIII in terms of warmth and musical conviction, yet adding to this a more transparent perspective. My previous experience of this combination was not wasted, since both units benefit from a very protracted warm-up period, after which the slightly lightweight balance of the power amplifier became fuller, if no less defined.

There was no overhang or 'bloom' at the bottom end. Not only were bass lines potent and full but the basic rhythmic elements seemed to start and stop with convincing speed. Treble notes were similarly well resolved and there was little or no smearing between high strings and percussion, for instance. In fact stringed instruments, whether plucked or bowed, showed delightfully precise clarity plus a tactility and stereo focus that conferred remarkable realism.

This Sumo combo was one of the few amplifiers in this test to realise the full emotional impact, the stability and detail resolution, available from the PDM digital source. These superb results were also reflected in the performance via both vinyl disc inputs, though there were slight degradations in quality going from CD through MM to MC – a slight increase in warmth and general cloudiness, together with a subtle constriction in the musical soundstage.

That aside, the listeners commented positively upon the performance of the very sensitive MC input, particularly as its presentation remained musically convincing. Vocals sounded fresh and articulate and percussion retained a fair degree of sparkle and vividness. Yet for optimum transparency and all-round openness, the CD input could not be beaten.

CONCLUSIONS

The build and individual component quality alone ensures that this combination represents excellent material value. However, it is

also exceedingly natural and realistic in the musical sense, providing an intimately detailed sound which avoids lapsing into clinical dissection.

The *Athena* preamplifier particularly demonstrates that a convincing musical performance can be obtained without recourse to mellifluous or euphonic colorations. As a combination, *Athena* and *Polaris* emerge as star performers in this amplifier test, and can therefore be heartily Recommended.

TEST RESULTS

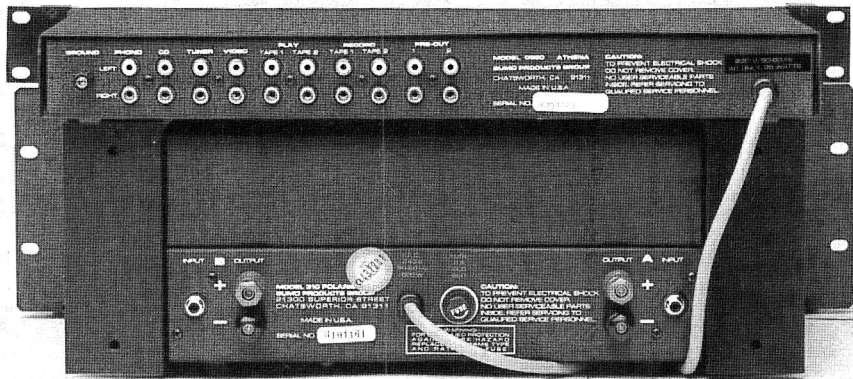
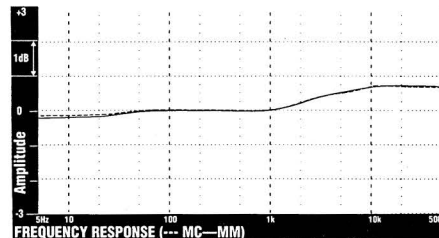
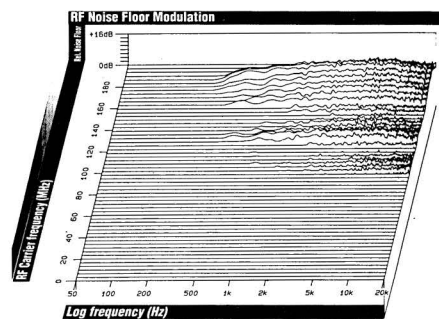
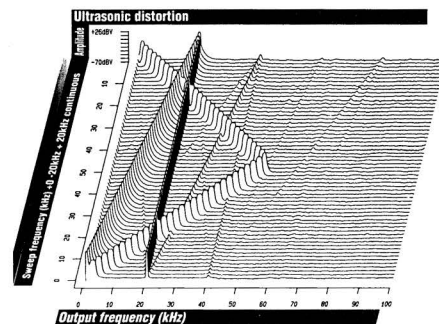
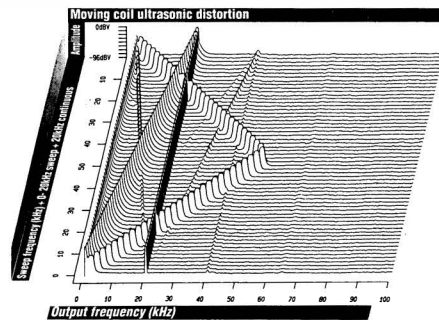
PREAMPLIFIER

	Aux/CD	MM	MC
Stereo separation (20Hz)	97.1dB	74.8dB	70.1dB
(1kHz)	83.9dB	77.5dB	74.9dB
(20kHz)	58.4dB	55.3dB	51.9dB
Channel balance (0dBV)	0.01dB	0.01dB	0.02dB
(-20dBV)	0.01dB	0.00dB	0.01dB
(-60dBV)	0.64dB	0.66dB	0.69dB
Total har. dist. (0dBV, 1kHz)	-106.1dB	-102.9dB	78.5dB
(0dBV, 20kHz)	-98.4dB	-95.2dB	-67.5dB
CCIR intermod. dist. (1:1)	-99.1dB	-80.9dB	-57.9dB
Absolute phase			Non-inverting
Phase shift (20Hz)	+3°30'	+12°30'	+12°
(1kHz)	0°	-47°10'	-47°30'
(20kHz)	0°	-83°10'	-83°10'
Squarewave linearity			-104.8dB
Noise (A wtd, 20Hz-20kHz)	-84.5dB	-81.8dB	-77.1dB
Residual noise (unwtd)	-91.6dBV	-91.5dBV	-91.4dBV
Input sensitivity (for 0dBV)	101.3mV	861.5µV	43.8µV
Disc overload (20Hz)		19.45mV	993.1µV
(1kHz)		179.0mV	9.095mV
(20kHz)		1554mV	80.25mV
(50kHz)		3247mV	77.90mV
Input loading	23.4kohm/110pF	46kohm/—pF	95ohm
Preamplifier Output (max)/Impedance	22.10V (disc)/74.3ohm		
Tape Output (max)/Impedance	20.97V (disc)/1.03kohm		
DC offset, left/right		0.0mV/0.0mV	
Typical retail price inc VAT			£695

POWER AMPLIFIER

	20Hz	1kHz	20kHz
Maximum Continuous			
Power Output - 8ohms	122.9W	127.9W	125.0W
- 4ohms	200.2W	211.7W	207.4W
Dynamic Headroom (IHF)		+1.14dB	(166.4W)
Peak Current (5msec, 1% THD)			29.9A
Output Impedance	0.028ohm	0.028ohm	0.045ohm
Damping Factor	285.6	289.4	179.5
Stereo Separation (0dBV)	135.5dB	125.0dB	113.8dB
Total Harmonic Dist. (0dBV)	-98.9dB	-102.7dB	-84.3dB
(½ power)	-92.1dB	-94.9dB	-76.1dB

CCIR Intermodulation Distortion (0dBV)	-99.7dB
CCIR IM Distortion (½ power)	-98.8dB
Rise Time (@ 10kHz)	1.2µsecs
Squarewave linearity	-96.6dB
Absolute Phase	Non-inverting
Additional Phase shift 20Hz	+2°30'
1kHz	0°
20kHz	-2°
Noise (A wtd, 20Hz-20kHz) 0dBV	-99.8dB
(A wtd, 20Hz-20kHz) ½ power	-117.4dB
Residual noise (unwtd)	-85.1dBV
Input Sensitivity (for 0dBV)	137.8mV
(for full output)	1568mV
Input loading	46.1kohm/255pF
DC offset, left/right	-9.5mV/-10.7mV
Typical retail price inc VAT	£695



Where do most integrated amplifiers end up?



They end up in the bin, because once you start to upgrade your HiFi system the integrated amplifier soon becomes the weak link.

You will be pleased to hear, that QED amplifiers are a little different. All Series II A240's and A270 integrated amplifiers are equipped with Pre-amp output sockets. This means that when the time is right, you can add one or even two of the new purpose designed QED P300 Power Amplifiers to achieve a dramatic improvement in sound quality.

So when you choose an award winning QED Integrated amplifier today, you also invest in tomorrow!

Please write or phone for full details, and a copy of our unique amplifier upgrade plan.



Illustrated products include the 1986/7/8/9 HiFi Choice Best Buy, and What HiFi award winning A240SA, plus matching T260 3 wave band Tuner and two P300 Power Amplifiers for dual — mono bi-amplification.

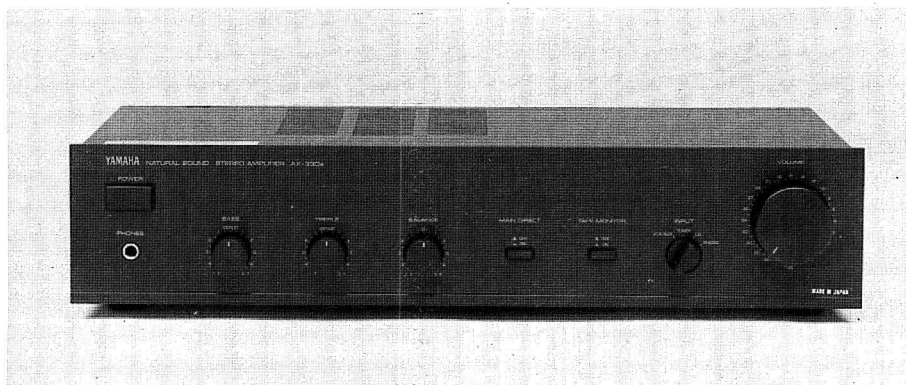
QED HiFi

The Audible Difference

QED AUDIO PRODUCTS LIMITED. UNIT 12, ASHFORD INDUSTRIAL ESTATE, SHIELD ROAD, ASHFORD, MIDDLESEX TW15 1AU.
TEL: (0784) 246236 (5 LINES) FAX: (0784) 248851

YAMAHA AX-330e

YAMAHA ELECTRONICS UK LTD., YAMAHA HOUSE, 200 RICKMANSWORTH ROAD, WATFORD, HERTS WD1 7JS. TEL: (0923) 33166.



Having noted the success of other Japanese hi-fi manufacturers that have introduced 'beer-budget audiophile' amplifiers, Yamaha has also decided to take the plunge. Dubbed the *AX-330e*, this new design offers several improvements over its similarly-styled *AX-330* predecessor. In particular the *e* is equipped with a 'main direct' switch which bypasses bass, treble and balance circuitry, connecting the volume control directly to the high gain power amplifier.

This power amp section is wholly symmetrical and composed entirely of discrete components, including a pair of Sanken *A1693/C4466* output transistors per channel. To aid sound quality, the *330e* features a set of hard-wired 4mm speaker sockets in addition to a set of spring-clip terminals which are switched by the headphone socket.

Inputs for one tape deck, three line and a single (MM) phono source are provided, along with a separate switch for tape monitoring. Unfortunately the tone control and phono eq amplifiers are not quite in the same class as the power amp. Although a sprinkling of quality electrolytics and metal-banded styrol caps are fitted, the RIAA network itself is based around a standard dual-channel JRC op-amp. Still, the amplifier is built to a very fair price, given the genuine alloy fascia and audio-grade ELNA power supply electrolytics.

LAB REPORT

Comfortably exceeding its 30W rating, the *AX-330e* delivers some 48W into 8ohms, rising by +1.7dB to 70W into 4ohms. Stereo separation deteriorates to 34-35dB at 20kHz due to capacitive coupling, while the maximum channel balance error on our sample occurred at -20dBV (rather than -60dBV) due to a nonlinearity in the volume control's conductive track.

Driving a standard 8ohm load between 0dBV (1W) and 3/4 output both THD and IMD were contained between 0.0045 and 0.0013 per cent - very low figures indeed. However, both THD and IMD increased into lower and more reactive impedances, the 3D plot (4ohm) betraying 2nd and 3rd-order IMD about the F_{20k} tone as well as its 2nd harmonic at 40kHz.

RF IMD is fairly well controlled above 50MHz, but the early +19dB break at 5MHz falls in a region of activity for many CD players. Elsewhere, the low A-wtd noise figures, even vinyl disc frequency response, 30.1dB disc headroom, input sensitivity and mild phase shifts are all perfectly acceptable.

SOUND QUALITY

During the listening tests, the *AX-330e* fared rather better than either the Akai or Aiwa models, yet failed to match the confident, captivating performance of either Denon or Rotel amplifiers.

In general the balance was smooth and unaggressive yet lively and moderately involving. More important, Yamaha seems to have shaken off the slightly sat-upon and muddy sound of its earlier amplifiers, for although the *330e* was not the most transparent of designs, it still offered a comfortable level of detail.

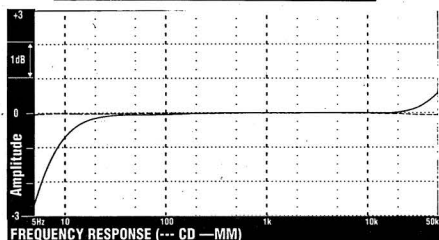
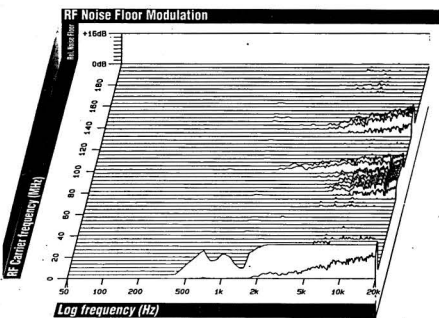
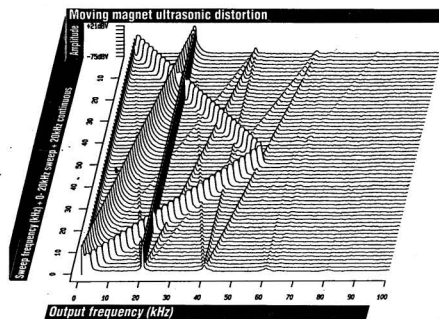
Bass lacked a degree of tautness and could wallow at times, though for some reason this was less obvious via the vinyl disc input which added some warmth and depth but was hardly up to providing a solid foundation for grand orchestral works. Vocals were not unduly tainted by sibilance but the sound of percussive instruments was not considered tonally pure. The characteristic timbre of percussion was smeared in an unfatiguing but rather nondescript fashion.

CONCLUSIONS

Yamaha has successfully engineered a very safe sounding amplifier in the *AX-330e*, but in the process has managed to lose a little of music's grip and vitality. The result is a trifle lacklustre or flat, but is also unlikely to upset those of a sensitive disposition. In essence, mass market compatibility is traded for the last ounce of detail and musicality. On that note I pronounce it well worth considering, but not sufficiently exciting for a strong Recommendation.

TEST RESULTS

	20Hz	1kHz	20kHz
Maximum Continuous Power Output - 8ohms	43.6W	47.9W	47.4W
- 4ohms	57.2W	70.1W	66.6W
Dynamic headroom (IHF)	+1.47dB (67.1W)		
Peak Current (5msec, 1% THD)	12.6A		
Output impedance	0.111ohm	0.110ohm	0.137ohm
Damping factor	72.4	72.8	58.3
	CD/Aux	MM	MC
Stereo separation (20Hz)	65.0dB	63.2dB	
(1kHz)	58.1dB	59.6dB	
(20kHz)	34.4dB	35.7dB	
Channel balance (-20dBV)	0.44dB	0.45dB	
(-60dBV)	0.21dB	0.25dB	
Total harmonic dist. (0dBV)	-97.8dB	-98.2dB	
(3/4 power)	-86.9dB	-90.3dB	
CCIR intermod. dist. (0dBV)	-96.5dB	-90.9dB	
CCIR IM dist. (3/4 power)	-91.2dB	-88.3dB	
Phase shift (20Hz)	+4°30'	+2°10'	
(1kHz)	0°	-50°30'	
(20kHz)	-17°30'	-93°30'	
Noise (A wtd, 0dBV)	-85.8dB	-81.9dB	
(3/4 power)	-96.5dB	-84.4dB	
Residual noise (unwtd)	-73.4dBV	-73.3dBV	
Input sensitivity (for 0dBV)	26.95mV	449.5µV	
(for full output)	188.6mV	3.101mV	
Disc overload (20Hz)		17.1mV	
(1kHz)		160.6mV	
(20kHz)		1498mV	
(50kHz)		3216mV	
Rise time			6.2µsecs
Squarewave linearity			-88.6dB
Absolute phase			Non-inverting
Tape output/impedance	9.65V (disc)/490ohm		
Input loading	48.6kohm/90pF 45.2kohm/180pF		
DC offset, left/right			-9.5mV/-8.6mV
Typical retail price inc VAT			£129



Now there's more than one Musical Approach!

For 2 years we have been Staffords only hi-fi specialist. Now, thanks to our customers support, we are opening a new branch in Aldridge offering the same great equipment with friendly help and advice.

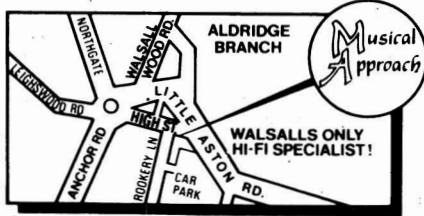
If music is important to you, phone us today - now we're doubly approachable.



We stock: Linn Products, Exposure, NVA, Onix, Ruark, Mantra, Revoiver, Creek, Ariston, Royd, Audio Technica, Chord Company, Monitor Audio, Heybrook, Tannoy, Rotel, Celef, NAD, Marantz, Stax, Epos, Arcam.

● DEMONSTRATION FACILITIES ● PART EXCHANGE ● CREDIT AVAILABLE

MUSICAL APPROACH
STAFFORD
 137A NEWPORT ROAD
0785-55154
 ABOVE ROYAL LONDON INS.
 MUSICAL APPROACH
ALDRIDGE
 37 HIGH STREET
0922 57926
 PARKING AT REAR



MOORGATE ACOUSTICS

*STOCKISTS OF THE WORLD'S
 FINEST AUDIO EQUIPMENT*

Including: Linn, Roksan, Krell, Audio Research, Musical Fidelity, Exposure, The Rock, Cyrus, Quad, Meridian, Magna Planar, Audio Innovations, Croft, Nakamichi, Celestion, Allison, Sonus Faber, Apogee, E.A.R., Marantz, Rotel, Denon & Van den Hul

Telephone our Rotherham Branch
for details of musical evenings

Make the sound choice . . . choose

MOORGATE ACOUSTICS LTD
 QUALITY · SERVICE · INTEGRITY

8 WESTGATE CHAMBERS S60 1AN
 (0709) 370666

184 FITZWILLIAM ST., SHEFFIELD
 (0742) 756048



AMPLIFIERS

A.R. A05	£199.95	£179.95
Ariston Amp	£199.95	£169.95
Conrad Johnson		
PV8	£1995.00	£1800.00
MV100	£3295.00	£2900.00
Kenwood KA660D	£169.95	£144.95
The Claymore	£396.00	£299.95
Lynx Quasar	£399.95	£309.95
NAD 3020E	£309.95	£199.95
3225	£149.95	-
3130	£309.95	£169.95
NVAAP30	£299.00	£269.00
A60		
P70	£830.00	£730.00
PSU		
QED A240CD	£179.95	£149.95
A240SA	£239.95	£199.95

TURNTABLES

Systemdek IIXE		
Alphason Opal	£425.00	£389.00
Map Audio X20		
Thorens TD321		
Alphason Delta	£438.00	£395.00
Townshend Avalon		
Hellius Scorpio	£529.00	£450.00
Goldring Eroica		
Kuzma Stabi		
Kuzma Stogi		
Power Supply	£309.95	£179.00
A.T. OC7		

SPEAKERS

A.R. Red Box	£99.95	£89.95
132	£199.95	£169.95
Allison CD6	£309.95	£289.95
Ariston Image	£159.95	£139.95
B&W 560	£199.95	£99.95
570	£249.94	£149.95
580	£309.95	£199.95
Monitor Audio R252	£309.95	£129.95
M7	£149.95	
R1200	£799.95	
R1800	£1299.95	
NVA Cube 2	£600.00	
Royd A7	£99.95	£89.95
Ruark Sabre	£349.95	£299.95
S.D. Acoustics SD3	£295.00	£269.95

CD PLAYERS

A.R. CD06	£299.95	
Denon DCD520	£369.95	
DCD620	£199.95	
DCD820	£249.95	
DCD1500II	£499.95	£399.95
Kenwood DP460	£169.95	£149.95
DP5010	£249.95	
DPX9010	£499.95	£450.00
Onkyo DX3500	£249.95	£229.95
Pioneer PD91	£309.95	£179.95
Revox B226	£749.95	£649.95
Sansui CDX5011	£299.95	£249.95
Marantz CD50SE	£299.95	



58 THE BROADWAY MAILORDER
MILL HILL EXPORT
LONDON NW7 3TC SINGLE SPEAKER
TEL: 01-906 3364 DEMONSTRATION ROOM

The World of Audio Conversions

Avondale Audio can transform the sound of your existing amplifier at a fraction of the cost of buying new. By incorporating the latest techniques and components into your amplifier, the very best in state of the art performance may be obtained, reliability will be improved and all without the search for new and even more expensive equipment.

Our conversion of the Musical Fidelity 'Pre-Amp' is proving as popular as ever. The performance of this remarkable little unit far exceeds most of the more expensive models once modified. The price of the conversion (including the external regulated power supply) remains at £207.00 inc.

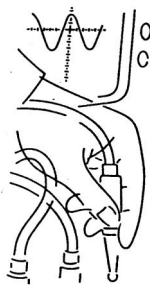
We are now able to offer as much as 6 (Yes SIX) channels of power to users of NAIM Pre-amplifiers along with an upgrade programme which takes this amplifier into quite another league. The conversion programme for the NAP series of amplifiers is now complete and the results achieved from the NAP 135 six pack after conversion can only be described as awesome. The little 110 power amp responds very favourably and in monoblok form gives the 250 quite a run for it's money.

Other products include the TAPS turntable power unit, (the best sound yet heard) for synchronous motors. Custom built power units for Oracle, Source and Voyd turntables are available to order.

For further information on our unique services please telephone or write stating models of equipment.

AVONDALE AUDIO

THE HOLLIES AVONDALE ROAD CHESTERFIELD S40 4TF
 TEL (0246) 200 096



AMPLIFIERS TECH TALK

Paul Miller explains the test procedures used in the amplifier reviews. Be warned, this is technical talk with a capital T!

In keeping with the *Choice* tradition, each amplifier was auditioned under blind conditions. Both CD and vinyl sources were used, with a range of software chosen for its ability to reveal different aspects of an amplifier's subjective performance.

The ancillary equipment included a Pink Triangle *PT T00*/SME *Series V/vdH MC-Two* as the analogue front-end. The digital source comprised an Arcam *Delta 170* CD transport coupled to an outboard D-to-A converter via a high speed (Hewlett Packard) optical link. A production Deltec *PDMI* converter (with proprietary RF mains filter) was used for the group listening sessions.

In my opinion this PDM-based system is capable of retrieving far more detail in a far more musical fashion than any conventional multi-bit converter. During the listening tests it was most instructive to hear just how much of the PDM decoder's qualities were retained or masked by the amplifier in question.

Once again, Magneplanar *MG2.5R* loudspeakers were used with long lengths of *Black Sixteen* cable. (Manufacturer's own-brand cables were used if so instructed.)

The listening programme included excerpts from: Tracy Chapman, *Crossroads* (Elektra CD); Lars Erstrand (Opus 3 CD); Chris Rea, *The Road to Hell* (WEA CD); Wet Wet Wet, *Holding back the River* (Precious CD); J. S. Bach, *Goldberg Variations* (Denon CD); Sting, *Nothing Like the Sun* (A&M vinyl disc); Jan Garbarek, *Legend of the Seven Dreams* (ECM vinyl disc); and Julia Fordham, *Porcelain* (Circa vinyl disc).

MEASUREMENT PROGRAMME

The test programme includes both standard IHF *A202* measurements plus some more advanced and elaborate techniques available with the IEEE-controlled digital test equipment currently used in my laboratory.

Power Output and Dynamic Headroom:

Quoted in good old fashioned Watts this refers to the maximum output of the amplifier into 8 and 40hm loads (one channel driven to 1 per cent THD). The IHF-A-202 dynamic headroom test employs a gated 1kHz signal, 20-cycles on/480 cycles off, and refers to a maximum of one per cent THD into 8ohms relative to the continuous rating into that same load.

For the first time the peak current available from an amplifier has been measured using a 5msec gated 1kHz signal into 1ohm, up to a limit of 1 per cent THD. Previous peak current measurements have not taken account of distortion, as evidenced by the asymmetric \pm values quoted. The use of a fixed THD benchmark enables all peak current values to be compared directly.

Separation, THD, IMD, noise and sensitivity and phase shifts:

All input sensitivities are measured with respect to an output of 0dBW (=1W) and full power at 1kHz for the integrated and power amplifiers, or 1V = 0dBV out (6dB higher than IHF) in the case of the preamplifiers. Noise is measured with respect to the IHF input levels of 500 μ V (MC), 5mV (MM) and 0.5V (line), input shorted, A-wtd and assessed as the true rms figure of 20 3rd-octave averages.

Disc overload is quoted in mV in the table so that this may easily be related to the peak output of a cartridge, while headroom is discussed in the text as a dB figure relative to these same IHF levels. Separation is measured at some +20dB above the nominal sensitivity, as is the THD of each amp. For CCIR IMD the respective peak composite (19kHz + 20kHz) levels were 10mV (MC), 100mV (MM) and 2V (line).

Any phase shift between the input and output of the amplifier (due to the effect of circuit poles and zeros) is now recorded relative to the absolute phase of the amplifier. Remember, a 180 degree phase shift is not the

same as a total phase inversion.

Broad-Band Radio Frequency Intermodulation Test:

In general terms this test reveals just how sensitive an amplifier is to spurious Radio Frequency noise, whether introduced directly or indirectly.

Conventional measurements examine the performance of the amplifier under closed-loop conditions where many of the inherent circuit non-linearities are compensated by the feedback network. By contrast this RF test probes the linearity of the amplifier under open-loop conditions where it is both nonlinear and uncompensated.

A precision RF signal generator produces an RF carrier signal at 20mV_{p-p}, modulated to 100 per cent using an external pseudo-random noise source. The resulting non-correlated AM/RF signal is then ramped between 1-200MHz by controlling the generator through an IEEE interface BUS, using a dedicated program developed in this laboratory. The generator and noise source are also synchronised with an FFT spectrum analyser through this same interface.

Once connected to the amplifier (via the line or CD-direct input) any subsequent demodulation/intermodulation between the sweeping carrier

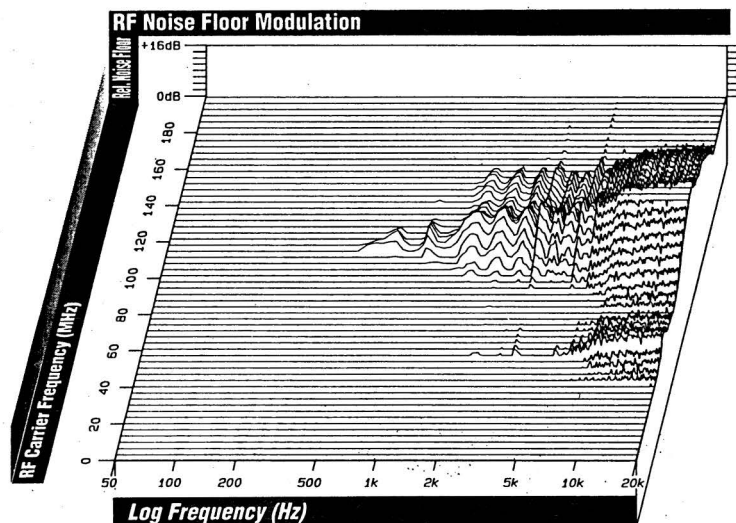
and its pseudo-random sidebands results in non-correlated noise appearing at audio frequencies at the output of the amplifier.

This represents a change in the noise floor of the amplifier over a discrete portion of its frequency range. Such a random fluctuation may not necessarily be heard directly, but simply makes it more difficult for the ear/brain to distinguish subtle dynamic inflections in the music signal itself.

By comparing the steady-state noise-floor of the amplifier with its noise floor under the influence of RF IMD, a measure of the difference and therefore the actual effect of RF IMD can be deduced. It is this change or difference in the noise floor that is depicted on the 3D plots.

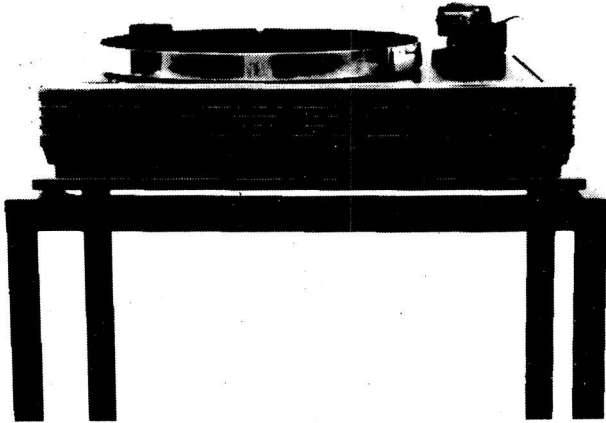
The depth or z-axis is calibrated in steps of 20MHz and denotes the changing frequency of the RF carrier. By contrast the x-axis is restricted solely to the audio band (in this case 50Hz-20kHz) and is calibrated across a log, rather than linear, scale. The vertical or y-axis gives an indication of relative amplitude and is scaled in steps of 2dB over a maximum range of +16dB.

Clearly, any demodulated RF noise that causes a change in the noise floor greater than 16dB will give rise to a plateau effect on the plot. This situation is seen on the accompanying example plot



Mana Acoustics

— HEARING, LIKE SEEING,
IS BELIEVING



Fed up with all those expensive upgrades not delivering the goods? Then you need "The Mana Touch".

'Mana Sound Tables & Shelves' use an open frame (patent applied for) with no 'Tubular Bells' in their construction.

Top and bottom levelling spikes for maximum stability, minimum point contact and easy setting up. The top platform is made up from polished 10mm plate glass. The whole assembly is not only visually attractive but also very rigid.

A circular spirit level is also available which has a hole on the underside to locate on the centre spindle thereby ensuring arm and platter are level. As they say 'Hearing, like Seeing, is Believing'.

Prices: Mana Reference Sound Table £275.00
 Mana Sound Table £175.00
 Mana Sound Shelf £125.00
 Mana Mini Sound Table £99.95
 Mana Spirit Level £25.00

14-day money back guarantee*

**Not applicable to Spirit Level*

Please send me (Cheque or Postal Order)

- Mana Reference Sound Table £275.00
- Mana Sound Table £175.00
- Mana Sound Shelf £125.00
- Mana Mini Sound Table £99.95
- Mana Spirit Level..... £25.00
- More details on Mana Products

Name

Address

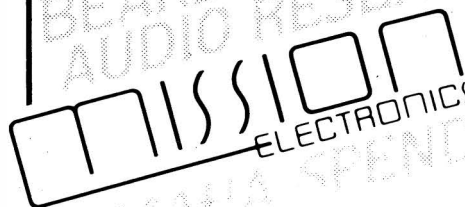
Tel

Phone for further details, demonstrations and appointments

Mana Acoustics

59 Jubilee Close, Pinner
 Middlesex HA5 3TB
 Tel: 01-429 0118

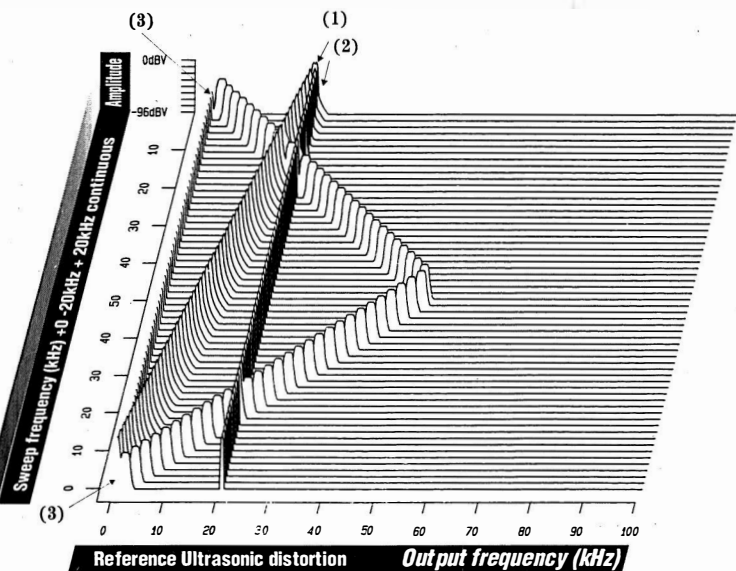
FOR
 25 YEARS
 WE'VE BEEN
 MIXING
 WITH THE
 RIGHT
 COMPANY



Without doubt — we require the same standards of service you have come to expect from us over the years. But don't just take our word for it, come in and experience the confidence we have in recommending and demonstrating **Mission Cyrus** only the very best in High Fidelity Equipment will do.

Spaldings
 ESTABLISHED IN SOUND
 01 654 1231/2040 - 352/4 LOWER ADDISCOMBE ROAD, CROYDON, SURREY.





which demonstrates an amplifier's undue sensitivity to RF noise in the 80-170MHz range, peaking at 117MHz. If an amplifier was singularly insensitive to RF noise (NB: a Good Thing), this plot of relative change would appear as a series of straight, unperturbed lines.

Ultrasonic Distortion Test:

Newly revised, this is a particularly revealing test that highlights the interaction of high and moderate-level signals in the context of harmonic and intermodulation distortions (referred to as 'routes' in the text) caused by such mechanisms as slew-limiting or the progressive reduction of feedback, the latter revealing an increase in open-loop non-linearities. It is not a knitting pattern, as one irreverent member of *Choice* would have you believe!

Three driving signals are employed, the 0-20kHz sweep (1 = F_{0-20k}) and continuous 20kHz tone (2 = F_{20k}) raising the amplifier to $\frac{2}{3}$ voltage output into a 4ohm load while the 0-50kHz-0Hz reversed sweep (3 = $F_{0-50k-0}$) tracks at a level some -24dB below this.

For integrated amps a pre equalised composite signal was used for either the MC or MM inputs (ref. 20mV and 2mV at 1kHz respectively). Strictly speaking an amplifier should be treated as a *voltage* source so each plot is individually calibrated in dBV (0dBV = 1V at 4ohms).

These sweeps were chosen to represent the kind of HF and ultrasonic signals likely to be handled by an amplifier in normal use. The ultrasonic spurious generated by CD players

is a well known example, but it is less widely appreciated that the 20-50kHz band noise from a vinyl disc or FM tuner can persist at levels only 10-20dB lower than peak signals in the audio band. (This is one reason why I place such store in disc overload margins, which generally fall relative to the excess gain required with increasing frequency, and why such measurements are now taken as high as 50kHz.)

That aside, certain of these ultrasonic distortions will introduce IM products within the audio band of the amplifier - a point of particular interest with vinyl disc stages, since the IM routes will actually increase in level with decreasing frequency as a function of the RIAA characteristic.

The most obvious harmonic products are determined by multiples of the F_{0-20k} sweep (1) (given by 4,5) and the F_{20k} tone (2) (given by 6,7). The remaining distortions shown on the 3D trace are produced by intermodulation between either or all of (1), (2) and (3) and (1) together with the harmonics of (2), ie (6) and (7).

Directly audible IM distortions include the difference products $F_{20k} - yF_{0-20k}$ [$y = 1,2$], given by (8) and (9), and $2F_{20k} - 2F_{0-20k}$ given by (10). Higher-order difference IM distortions associated with multiples of (2) and (1) will also find their way into the audio band.

This example plot shows a variety of basic summation IM routes such $F_{20k} + yF_{0-20k}$ [$y = 1,2,3$] given by (11, 12 and 13), together with higher-order secondary summation IMDs such as $2F_{20k} + yF_{0-20k}$ [$y = 1,2,3$] and $3F_{20k} + yF_{0-20k}$ ($y = 1,2,3,4$). (These are marked as (14)-(16) and (17)-(20) respectively.) Extremely high-order routes such as $4F_{20k} + yF_{0-20k}$ [$y = 1,2,3$], (21)-(23) are also visible.

Of course there are the interactions between (3) and (1) and (2) to consider. Three summation IM routes are clearly visible: $F_{0-50k-0} + F_{0-20k}$ (24), $F_{0-50k-0} + F_{20k}$ (25) and $F_{0-50k-0} + F_{0-20k} + F_{20k}$ (26)!

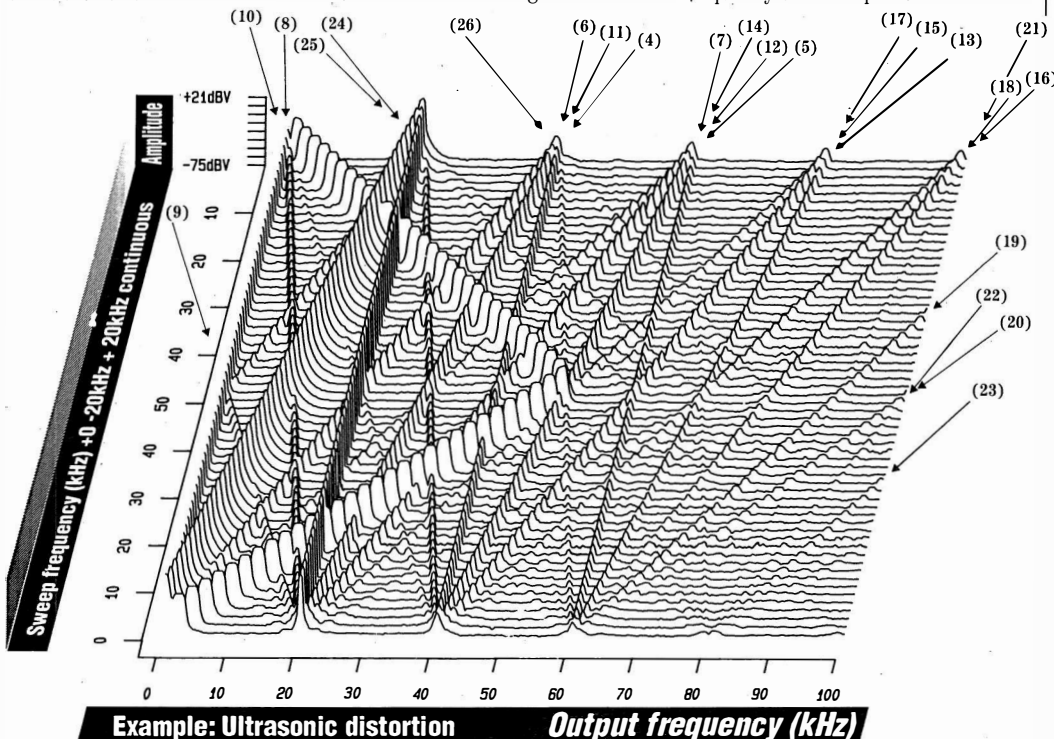
In general the presence of 2nd-order in-band IMD products seems to encourage a warmer

though softer and richer sound quality, particularly if these distortions arise in the disc stage. The equivalent 3rd and higher-order IMD mechanisms seem to introduce a harder and less beguiling character.

A word of warning. Do not use these plots in isolation as some sort of guide to the absolute quality of the amplifiers, because this is simply not the case. Any distortion mechanism represented on the plot will have some subjective consequence. Conversely, just because a peculiar coloration or distortion is heard this does not mean it will necessarily be manifest on the 3D plot. This test is but one piece in a very complex jigsaw, and the results must also be viewed in the light of those obtained via the RF IMD test.

The combination of Ultrasonic Distortion and RF IMD plots can provide a valuable indication of both the amplifier's subjective performance and of its likely compatibility with other audio equipment, particularly CD players. An amplifier that gives rise to a 'clean' Ultrasonic plot but suffers RF demodulation may well sound coarse or muddled as a result. Conversely, a relatively constant carpet of innocuous closed-loop distortions can effectively 'mask' the fatiguing effects of RF IMD.

Taken together, the two plots give more insight than ever before into the potential sound quality of an amplifier.



SUGDEN

25 YEARS OF INDIVIDUAL HAND
BUILT HI FI EQUIPMENT



J. E. SUGDEN & CO. LTD.

VALLEY WORKS · STATION LANE · HECKMONDWIKE · WEST YORKSHIRE WF16 0NF · ENGLAND
Telephone: Heckmondwike (0924) 404088/9



THE CONTINUING ADVENTURES OF

S.U.P.E.R.-G.I.R.L.

► GUARDIAN OF MUSIC ◀

- ALSO STARRING · Acoustic Energy · Arcam · Ariston · Audio Innovations
B&W · Cambridge Audio · Castle · Celer · Creek · Cyrus · Denon · Dual
Epos · Exposure · Gale · Heybrook · JBL · KEF · Linn · Marantz Audiophile
Michell · Mission · Monitor Audio · Musical Fidelity · Naim · Nakamichi
Oracle · Pro Ac · QED · Quad · Rega · Roksan · Rotel · Ruark · Sony ES
Tannoy · Wharfedale · Yamaha

Winners of the FBA Dealer of the Year Award for 1988 and 1989 and the Sony Hi-Fi Dealer Award for 1988.

The Audio File

27 HOCKERILL STREET
BISHOP'S STORTFORD
HERTS. CM23 2DW
(0279) 506576



AMPLIFIERS: CONCLUSIONS, BEST BUYS AND RECOMMENDATIONS

Paul Miller rounds up the best of this month's bunch.

This is now my third *Choice* amplifier test, and is marked by a very wide and interesting range of products. Although it is never a foregone conclusion that a certain percentage of the amplifiers will achieve either Recommended or Best Buy status, the polling certainly appears to have been more than usually enthusiastic this time around!

To warrant Recommendation, an amplifier must attain either a competent overall level of performance, or an acceptable mix of excellent and average subjective findings. The product should also be well-built, inherently reliable and sensibly equipped to compete within its particular price bracket. An amplifier with excellent all-round subjective performance and which costs less than £300 may well be in line for a Best Buy rating.

There would be little point in nominating half a dozen Best Buys at any particular price point; instead it is better to establish certain distinct benchmarks on the various rungs of the price ladder. Such established yardsticks of the amplifier world are included in the comprehensive *Directory*, providing the long term standards for subsequent review collections.

Just over half the integrated amplifiers proved worthy of Recommendation on this occasion, though some were tempered with a qualification or two.

Three such were the Sondex *Amadeus Silver*, Creek *CAS-4140 S2* and Harman Kardon *HK6100*. Each offers a distinct musical 'flavour' and each is consequently quite beguiling. Yet the Sondex leaves room for improvement in PCB layout, power delivery and distortion; the Creek would benefit from better disc stage overload margins. There are no obvious technical anomalies in the *HK6100*, though the fact that under the skin this amplifier is so

little different from its *PM635i* predecessor is a source of mild disappointment.

No such provisos hang over the Kenwood or Denon models, though the latter is certainly the more transparent and exciting. Indeed, the Denon *PMA 250II* represents a genuine step forward compared to its predecessor, delivering a deeper, more vital and more consistent sound via both CD and vinyl disc inputs. By contrast the Kenwood *KA-4010* is an altogether smoother and more cautious-sounding product – ideal for controlling an unruly budget system!

Moving up the price ladder, our listeners were most impressed with the extra refinement offered by both the Musical Fidelity *B1* and the Rotel *RA 840BX4*.

Latest production samples of the *B1* offer a very tight, detailed and solid sound, not unlike a sophisticated version of the *PMA-250II*. Its disc stage is not quite as transparent as the CD input, but the potent bass and refined musical perspectives still manage to shine through.

Rotel's *BX4* version of the *840* marks a worthwhile improvement over the *BX3*, offering a similarly cultured and detailed sound but with an added transparency and lightness of touch. Do watch the phasing of

the loudspeaker leads with this amplifier.

At a still higher price, the *Integrated* Kelvin Labs amplifier has a remarkably even-handed performance with a see-through, detailed and fundamentally musical sound, particularly via CD. Limited power output puts a restriction on insensitive loudspeakers, but this apart it represents a very sensible proposition. Taking to heart some criticism over the ugly-duckling styling, Kelvin is soon to be launching the *Integrated* in a much better case – but price will increase £45 to £395.

For those with money to spare, who can appreciate the potential longevity of a superbly engineered yet visually elegant amplifier, the Cyclone *Catalyst* is an ideal candidate. This new UK-designed amplifier is superbly constructed and is exceptionally tolerant of very difficult loudspeaker loads. There are cheaper, less 'professional' amplifiers available that might offer a more spacious and animated sound, but the *Cyclone's* very stable and measured quality is justification enough for Recommendation.

There were fewer pre/power combinations in this month's test but the new Exposure *XI/VIII Super* still came through with flying colours. These have a comfortably detailed and very

lush sound, ideal for fatigue-free extended listening. The new alloy faceplates provide a bolder appearance too.

I have deliberately left the best to last, for two amplifiers stand out head-and-shoulders above the rest in their respective categories. The modestly priced Rotel *RA-820AX* earns itself an unqualified Best Buy, while at the other end of the price scale the Sumo *Athena/Polaris* combination certainly deserves the heartiest of Recommendations.

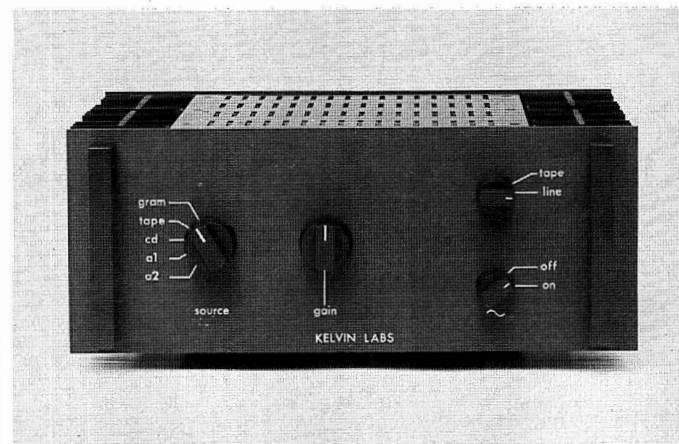
In many respects they share a common goal, providing a delightfully unhurried yet very secure and wondrously open sound. Few amplifiers are more capable of revealing the powerful emotive qualities of PDM D/A conversion – guitars, brass and percussion sparkling with a life and vivacity not commonly associated with this medium.

Clearly the *RA-820AX* is a little less civilised in its presentation, but a performance that can so effectively immerse the listener in the music makes any such detractions pale into insignificance.

The Sumo duo does not quite redefine our expectations of below £2,000 amplifiers, but it comes dangerously close. The *Athena* preamplifier is particularly neutral and revealing, and incorporates a very sensitive MC input that can compete with the very best of its peers.

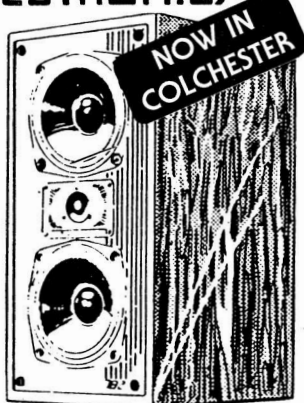
As a combination they represent spectacular value for money, and are more than capable of taking on many of the more strenuously hyped US exotics.

To conclude I should like to thank those companies who submitted amplifiers for inclusion in this gruelling test, and acknowledge the help provided by Martin Jeffrey, John Bamford, Robert Watts (Deltec Precision Audio) and Tony Mills (Rotel) during the listening tests.



Kelvin Integrated: buy while old stocks last.

MISSION ELECTRONICS



THE FULL RANGE OF MISSION LOUDSPEAKERS AND CYRUS ELECTRONICS ON PERMANENT DEMONSTRATION

Our Fine selection includes:

- AUDIOLAB • CAMBRIDGE • CELESTION
- CYRUS • DENON • DUAL • HEYBROOK
- MARANTZ • J.A. MICHELL • MISSION
- NAD • PINK △ • QUAD • ROGERS
- ROTEL • S.M.E. • SNELL • SPENDOR
- TANNOY • THORENS • TDL • WHARFEDALE
- YAMAHA

Lyon Audio

Hi-Fi Sound & Design Specialists

16 PEARTREE BUSINESS CENTRE
PEARTREE ROAD, STANWAY, ESSEX
Tel: COLCHESTER (0206) 560259

Credit Arranged - details on request



PHONE
0474 560521
FAX
0474 333762

P. M. COMPONENTS LTD
SELECTION HOUSE, SPRINGHEAD ENTERPRISE PARK
SPRINGHEAD RD, GRAVESEND, KENT DA11 8HD

TELEX
366371
TOS-PM

HI-FI Valves

Over 3 million valves available from stock. Please phone for a competitive quote.

We offer: specially selected pre amp valves; a wide range of matched power valves; high quality CV and ruggedised valves;

PHILIPS/MULLARD

E80CC	25.00
E81CC	4.50
E82CC	4.50
E83CC	4.50
E88CC	5.50
E182CC	7.50
ECC81	2.50
ECC82	1.95
ECC83	1.95
EL34	12.50
EL84	4.50
CV4024	4.50
CV4003	4.50
CV4004	4.50

* Low-microphony specially selected valves

ECC81	2.50
ECC82	1.85
ECC83 Super	3.50
ECC88 Super	3.35
EL34	4.50
EL84	1.95
EL86	2.75
GZ34	4.50
6L6GC	4.50
6550A	9.95
7025	3.50
KT88	16.00
PL519	5.95
EL34 Super	4.50

GEN. ELECTRIC/RCA

5U4GB	4.50
6CA7	10.00
6L6GC	9.50
5751	2.95
5814A	3.25
5881	9.95
6080	8.50
6550A	13.95
7027A	12.50
7189A	7.50
7868	8.50
8417	9.95
KT66	11.95
211	25.00

TEONEX TESTED

2A3	12.50
6B4G	10.50
6BQ5	0.95
6CA7	3.95
6DJ8/ECC88	1.35
6SN7GT	3.15
12A7	1.50
12AU7	0.85
12AX7	0.95
811	14.95
245	23.00
EF86	2.50
KT66	5.00

SIEMENS

6189	3.50
6201	6.45
E80CC	25.00
E81CC	5.50
E280F	19.50
E288CC	17.50
ECC81	2.50
ECC82	2.50
ECC83	2.50
ECC801s	6.95
ECC802s	6.95
ECC803s	6.95
EL34	4.50

P. M. COMPONENTS LTD



How to buy: You may phone our sales desk 0474 560521 (24 hour answering service) and order by credit card or send your order with cheque/postal order and we will despatch all ex stock items the same day.

UK orders p&p £1.00 per order. Please add 15% VAT to prices shown. Export orders welcome, carriage at cost.

SONY DEALER AWARDS
HI-FI NEWS 1986 and 1989
RECORDS REVIEW WINNER
GREATER LONDON

GRAHAMS HI-FI

Grahams Hi-Fi Ltd. Canonbury Yard 190A New North Road London N1 7BS Tel: 01-226 5500

Come to Canonbury Yard,

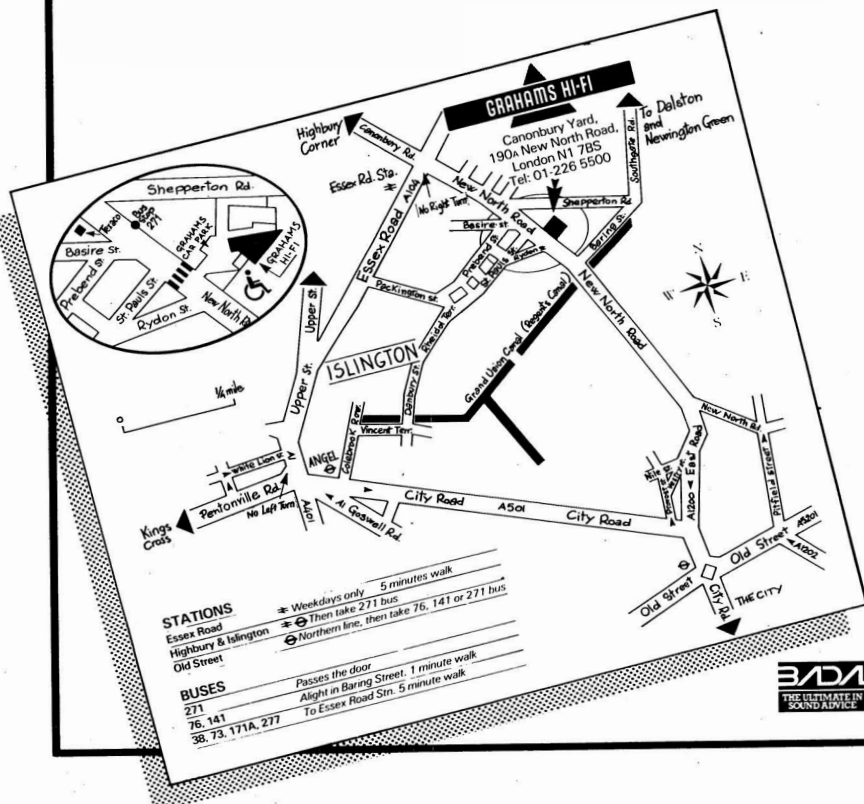
where our new purpose-built premises are situated, and listen....

...in one of five air-conditioned demonstration rooms with probably the finest hi-fi facilities in Europe, plus lots of free parking.

Listen and compare selected models from manufacturers such as Linn, Naim, Rega, Arcam, Meridian, Creek, Denon, Yamaha, Nakamichi, Onix, DNM, Royd, etc.

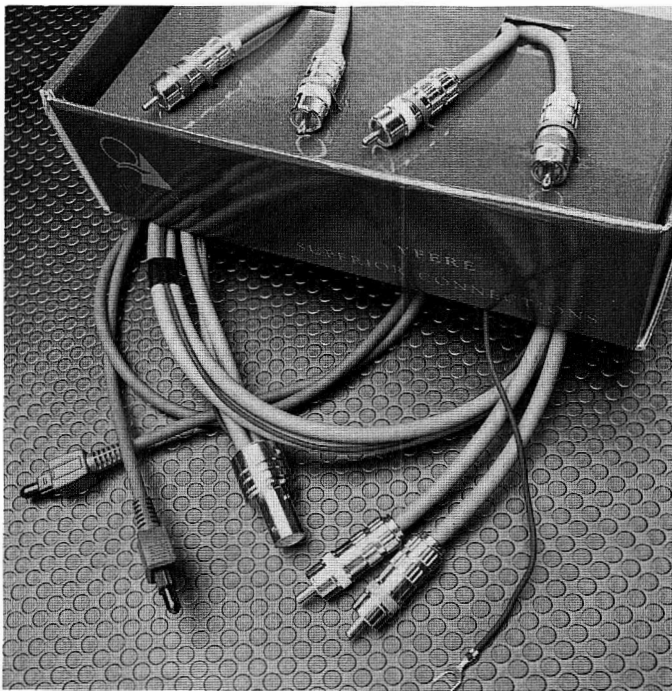
Evaluate systems and products, chosen with more than 20 years experience, in a relaxed atmosphere, with the assistance of helpful, trained staff. Our reputation has been established by providing the highest standards of personal service.

We are here to help you.



QUANTUM CABLES OFFER

Improve the sound quality of your hi-fi system with these top quality LC-OFC interconnects, PC-OCC speaker cables and save pounds.



YFERE and YBLENT cables and plugs are the latest accessories to be distributed here by Quantum Audio of Scotland. These high quality cables all use linear crystal oxygen free copper wires (LC-OFC) and beautifully crafted solid copper phono plugs which are gold plated. There are two basic configurations: Twin and Quad. The Twin leads employ two LC-OFC conductors of 22 strands, whereas the Quad leads use four conductors of 20 strands.

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

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

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

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

Simply fill in the form opposite and leave the rest to us.

All our prices are inclusive of postage, packing and VAT. Please allow 28 days for delivery.

TO ORDER QUANTUM CABLES

(Tick selections)

SUPER

	Rec. Retail Price	Our Price
<input type="checkbox"/> 004-003 LC-OFC Twin .5m pair	\$43.00	£39.95
<input type="checkbox"/> 004-004 LC-OFC Twin 1m pair	\$53.00	£49.95
<input type="checkbox"/> 004-005 LC-OFC Twin 1.5m pair	\$63.00	£59.95
<input type="checkbox"/> 004-006 LC-OFC Twin 2m pair	\$73.00	£69.95

SUPERIOR

<input type="checkbox"/> 004-001 LC-OFC Tonearm Cable 1m pair	\$80.00	£76.95
<input type="checkbox"/> 004-010 LC-OFC Phono Quad .5m pair	\$75.00	£71.95
<input type="checkbox"/> 004-011 LC-OFC Phono Quad 1m pair	\$85.00	£81.95
<input type="checkbox"/> 004-012 LC-OFC Phono Quad 1.5m pair	\$95.00	£91.95
<input type="checkbox"/> 004-013 LC-OFC Phono Quad 2m pair	\$105.00	£99.95
<input type="checkbox"/> 004-020 LC-OFC Phono Twin .5m pair	\$65.00	£61.95
<input type="checkbox"/> 004-021 LC-OFC Phono Twin 1m pair	\$70.00	£66.95
<input type="checkbox"/> 004-022 LC-OFC Phono Twin 1.5m pair	\$75.00	£71.95
<input type="checkbox"/> 004-023 LC-OFC Phono Twin 2m pair	\$80.00	£76.95
<input type="checkbox"/> 004-040 Fibre Optic 1m pair	\$150.00	£139.95

FURUKAWA SPEAKER CABLES

FS2T09 (0.09mm², 33-strand)

<input type="checkbox"/> 2 metre pair	£24.00
<input type="checkbox"/> 3 metre pair	£36.00
<input type="checkbox"/> 5 metre pair	£60.00

FS2T20 (2mm², 80-strand)

<input type="checkbox"/> 2 metre pair	£48.00
<input type="checkbox"/> 3 metre pair	£72.00
<input type="checkbox"/> 5 metre pair	£120.00

FS2T35 (3.5mm², 7 x 20 strand)

<input type="checkbox"/> 2 metre pair	£100.00
<input type="checkbox"/> 3 metre pair	£150.00
<input type="checkbox"/> 5 metre pair	£250.00

I would like my speaker cables terminated with ...

- 4mm banana plugs
 spade connectors
 unterminated

PAYMENT

I enclose cheque/PO made payable to Dennis Publishing

for _____

Please charge my Mastercard (Access)/Visa (delete as appropriate)

Credit card number _____

Expiry date _____

Signature _____

Name _____

Address _____

Postcode _____

(HFC80)

Offers available to UK readers only.

Please send order form with payment to:

Hi-Fi Choice Mail Order, PO Box 320, London N21 2NB.

LINN - NAIM - DENON - ONKYO - HEYBROOK - AR - BLQ

EXPOSURE - A&R - CASTLE - TARGET - AIWA - LINK AUDIO - ROKSAN

Who Cares?

mike manning AUDIO

The Hi-fi Emporium

Closed Mondays 110 Middle Street, 0% finance details on request
Yeovil, Somerset

Telephone (0935) 79361



MARANTZ - QED - MISSION - CREEK - ROTEL - CAMBRIDGE AUDIO - REGA

INCA TECH - MONITOR AUDIO - ION SYSTEMS

LINN - NAIM - DENON - ONKYO - HEYBROOK - AR - BLQ

EXPOSURE - A&R - CASTLE - TARGET - AIWA - LINK AUDIO - ROKSAN

WE CARE!

mike manning AUDIO

The Hi-fi Emporium

Closed Mondays 110 Middle Street, 0% finance details on request
Yeovil, Somerset

Telephone (0935) 79361



MARANTZ - QED - MISSION - CREEK - ROTEL - CAMBRIDGE AUDIO - REGA

INCA TECH - MONITOR AUDIO - ION SYSTEMS

WEST MIDLANDS AUDIO

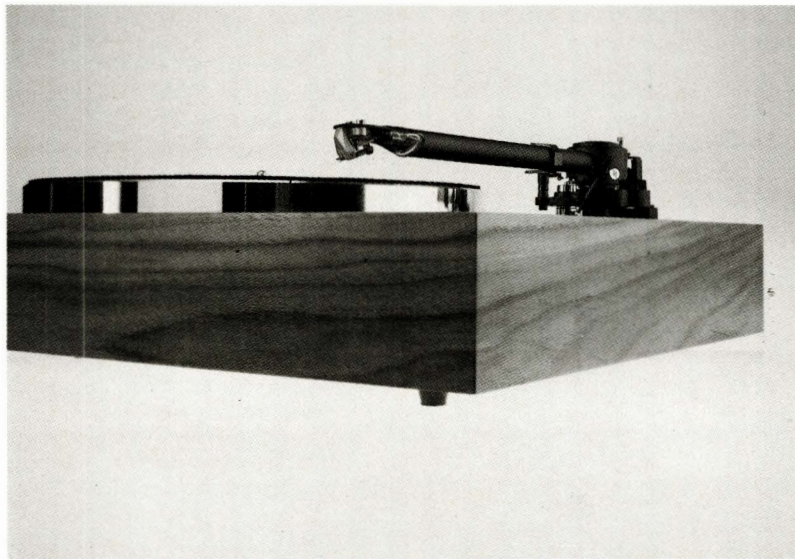
AUDIO CONSULTANTS

XERXES

ARTEMIZ

SHIRAZ

DARIUS



ALL ON PERMANENT DEMONSTRATION:

A&R, ACOUSTIC ENERGY, CREEK, DENON, DEPOS, HEYBROOK, ION SYSTEMS, LINN PRODUCTS, MARANTZ, MISSION CYRUS, NAIM, NAKAMICHI, ONKYO, REVOX, ROTEL, ROYD, SME.

158 Ombersley Rd., Worcester, WR3 7HA Tel: WORCESTER (0905) 58046

Demonstrations by appointment

OPEN MONDAY-FRIDAY 9.30 to 8.30 - SATURDAY 9.30-5.30



WHY CLEARSTONE KNOWS MORE ABOUT CHOOSING HI-FI THAN HI-FI CHOICE

What is Hi-Fi for, if it's not for pleasure? And what real pleasure does one get, when even the most esoteric and well set up system is drowned by the constant nagging of one's partner. Simply because the material on the front of the speaker grille doesn't go with the colour of the front-room curtains.

When you serve as many people as we do, these are the kinds of problems we deal with every day. No Hi-Fi publication could possibly handle them 'en masse'. Each requires individual time, care and careful consideration.

At Clearstone, we've built up a reputation for precisely this.

A customer will tell us what he wants. Let's say a Linn LP12, Ekos arm, Troika cartridge, Naim 72, Hicap, 250 and a pair of Kans. He

also explains that he can't

site them near a wall if they're mounted on stands (let alone spike them into the floor) and the only available wall to which they can be mounted is in bad need of repair and won't stand up to the weight and continual vibration.

Initially we'll comment on his choice of equipment (just to ensure he understands the implications of how the match will effect the final sound).

We'll then invite him to make an appointment to listen to whatever is the agreed ideal, and a Clearstone devised alternative which takes into consideration the additional structural problems.

On his return, a highly skilled and experienced member of staff will escort him to one of our single speaker dem. rooms where the two systems will be ready and set up for an A-B comparison.

Invariably the customer goes away satisfied, and most likely we'll want to set it up ourselves.

So when on your travels you next see a new pair of Kans on the floor, away from a wall with a very nice pot plant on one, you'll know two things for certain.

The system is not sounding anything like it should.

And it wasn't bought from us.

CLEARSTONE CONTROVERSIAL BUT TRUE



INTERVIEW

Bebop Deluxe singer and guitarist Bill Nelson says he is creative enough to produce an album a month. Dan Houston visits him, Chris Richardson photographs.

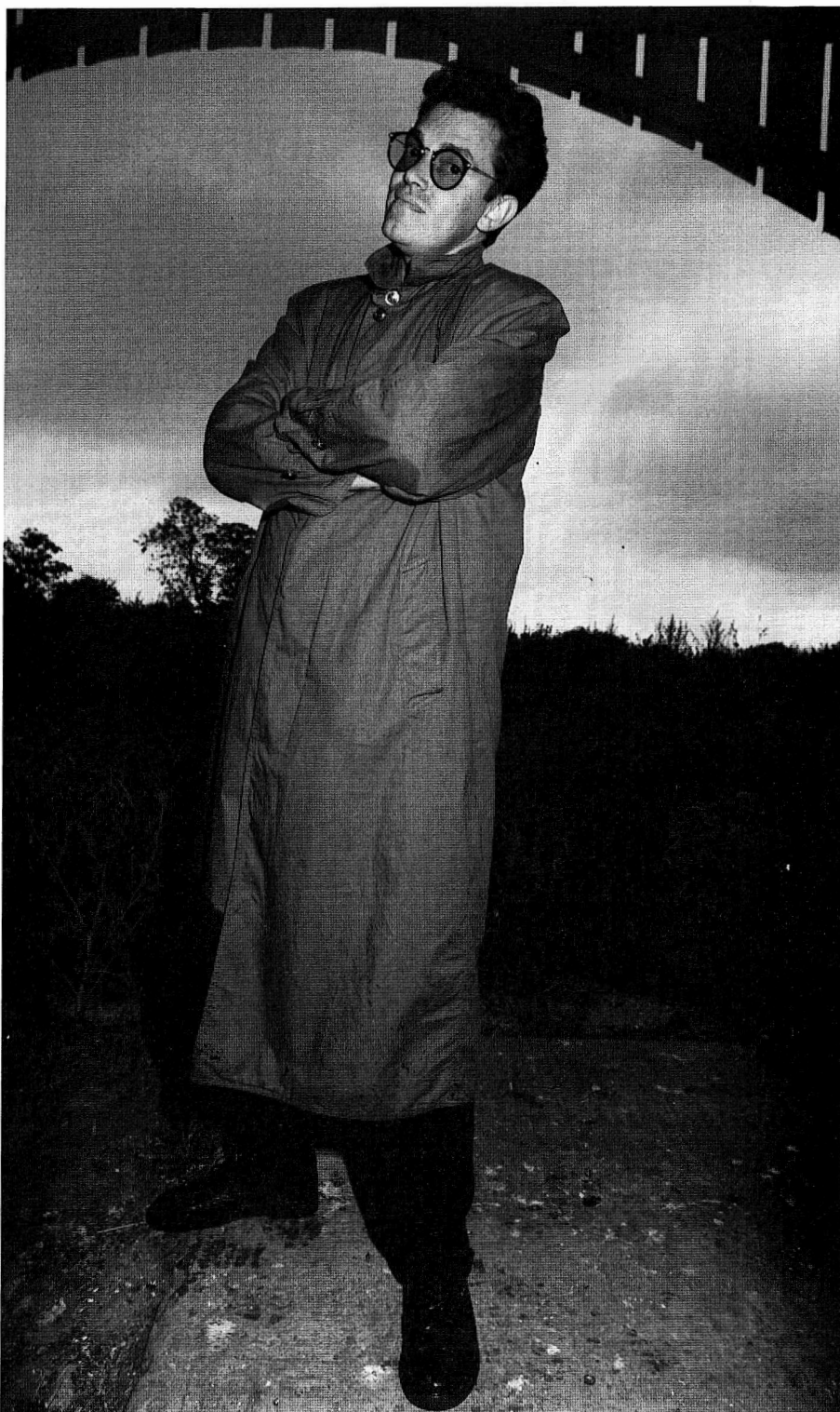
It's a rainy day at York station. A two-tone Deux Cheveaux trills in, bounces to a halt and a trim-for-41 Bill Nelson steps out. We're here to visit his home – a 17th century three storey farmhouse – some 20 minutes drive away where he lives with his wife and two children. He's recently traded in a near-stately mansion for the new house, and his Porsche 911 for the 'new car'. He's also trading in a life of reclusive musical obscurity to get back in the public eye with a new Bebop Deluxe line-up. Our pictures are black and white but he's obviously dreaming in colour.

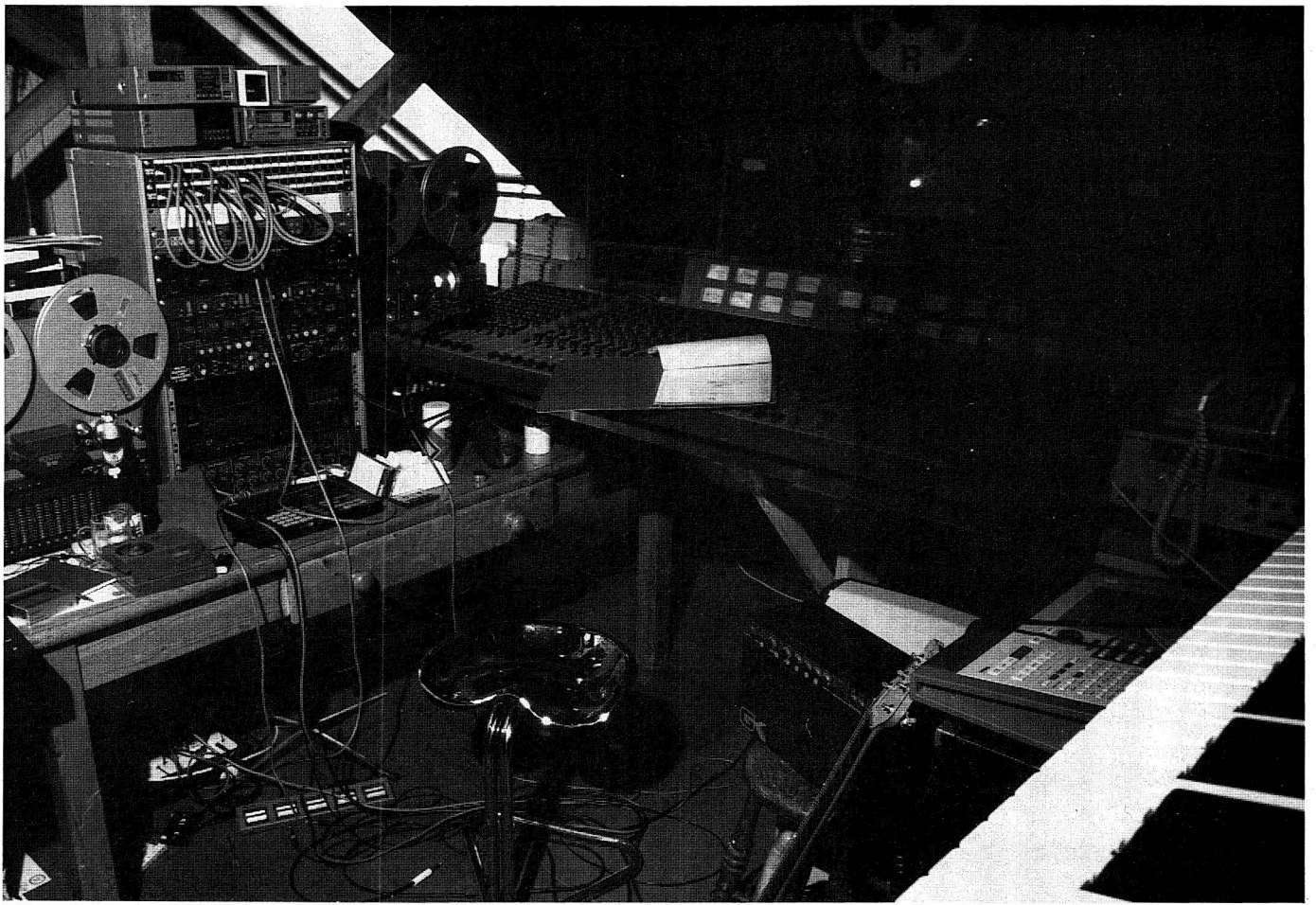
Most people over the age of 20-something know Bill Nelson as the lead guitarist and singer from that quintessential '70s band Bebop Deluxe. A solo career – both as himself and The Orchestra Arcana – since 1978 has taken in film and advertising scores, some 23 albums (eight of them instrumental) and producing work. There have been the scores for *Brond* and *Dream Demons* but mainly it's been pretty low key, if prolific, stuff. However, he says he never wanted to have anything to do with the music industry after Bebop disbanded and has since tried to fund his own label – Cocteau Records – with revenue from advertising work.

It lets him get on with what he wants to do – writing and recording music (on to Betamax cassettes!) in the attic of his house. He keeps himself almost compulsively busy – indeed overwork caused a split with his wife Jan in 1988 – and he has a stack of cassettes, representing years of unreleased recorded work. "I couldn't stop writing music; I think I'd go insane," he offered by way of explanation in a slight Yorkshire drawl. "In fact I don't know whether I am insane and it's the music that caused it or it's the other way round." Oooh er . . . the artist on a mind trip – better change the subject. What's the message behind this contemporary instrumental music? "If there is a message in my music it's one of inner discovery. I like to think people recognise things in the music that are dormant in all of us – I get a lot of letters from America saying: Thanks for the psychology – you're kinda like a low rent psychologist!"

He is so prolific that he believes he could put together a monthly album – a sort of Bill Nelson musical magazine. "It would cost a couple of quid, and if there are only a couple of tracks you like then you could record them and throw the rest

Bill Nelson





The attic studio is a place to work (above), rest and pray – the altar is out of sight.



away; it's more disposable but it's cheaper so you don't have so much to lose. But the market isn't geared to present music to people in that way and there isn't enough profit in it for the record industry." Part of the reason for the vast pile of unreleased recordings is that Bill Nelson never labours on a song – believing that in practising and perfecting it he would lose the raw energy of the piece. "I can't keep my interest in a piece of music for longer than two weeks. Maybe I should concentrate on the quality rather than the quantity but if a song I'm working on takes longer than an hour from writing to mixing then I think I must be labouring it – I prefer it to be a stream of consciousness thing."

Consequently he has just released a four CD boxed set – *Demonstrations of Affection* – which consists of some 80 songs (out of 140) written when his wife moved out and their marriage nearly broke up. "I did these songs without the thought of anyone ever getting to hear them," he says without a hint of self-consciousness. "My system isn't geared to doing vocals and these songs are bare and open and full of technical errors. I just picked up the mic and sang it as it came, first take. It's all raw nerve stuff but I think it would be difficult to go into a studio with a band and breathe any more life into them."

"... Could this mean
The End of the Line
For those Audio
Nasties?"

RANDORA

Mains Conditioner
No Filters, No Compromise

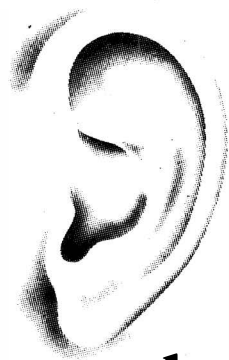
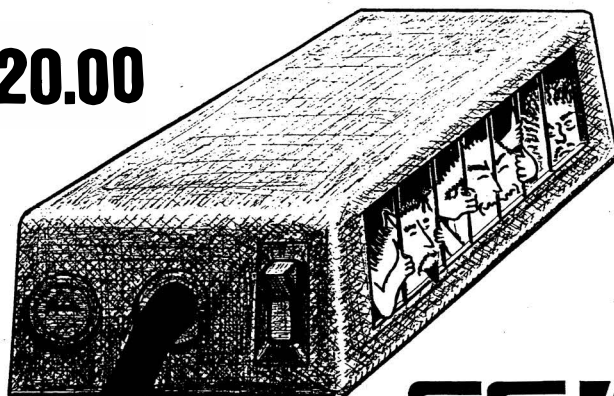
£120.00

E.C. AUDIO

TEL. READING

(0734) 589186

FAX (0734) 504556



... Lend me
your ears ...
and you'll hear music like
you've never heard it before.

We are probably the only specialist Hi-Fi Dealers who record as well as listen to live music. With this expertise we can recommend equipment from the following manufacturers:-

AUDIO INNOVATIONS, Audionote, Audion, Ariston, BLQ, Beyer, Decca, Denon, Foundations, Goldring, Helius, Jecklin-Float, JPW, JBL, Marantz, Nagaoka, Nakamichi, Ortofon, Pink Triangle, Pirates, QED, Revox, Rotel, The Rock, Sennheiser, SNELL, Sony, Sugden, Supra, Systemdek, Torlyte Platforms, Target, VALDI, VOYD.

Audio South

"Professional record cleaning service now available."

Ex Dem and S/Hand equipment available - ring for details.

5, Mead Lane, Farnham, Surrey. GU9 7DY.

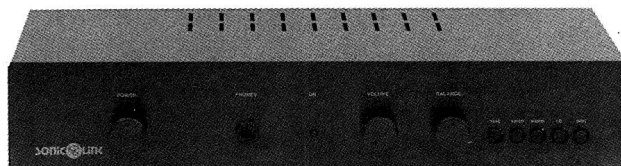
Tel: (0252) 714555



Open Monday to Saturday 10-6 pm
Demonstrations by Appointment



AUDIOKITS Precision Components



For the person whose expectations of musical pleasure go beyond the limitations of conventional audio amplifiers . . .

The SONIC LINK DM20 can be heard at these specialist hifi dealers:

ACOUSTIC ARTS, Watford	0923-245250
AUTHENTIC AUDIO, Stratford upon Avon	0789-414533
AYLESBURY HI-FIDELITY, Aylesbury	0296-28790
LISTEN HEAR, Ilkeston, Derbyshire	0602-304602
MJS HIFI, Barwell, Leicestershire	0455-846977
OMNI AUDIO, Leeds	0532-758326
RADLETT AUDIO, Radlett, Hertfordshire	0923-856497
STANDENS, Tonbridge	0732-353540

AUDIOKITS Precision Components

6 Mill Close, Borrowash, Derby DE7 3GU
Telephone: 0332-674929

Starting to sing again has coincided with the wish to perform in public once more. Although he doesn't seem the least bit shy he had to be persuaded to play at the closure of a friend's pub near Selby. "It was very much a last minute thing, but we got nine musicians arranged between a Friday night and Saturday morning. We just wanted to jam but they put up a poster saying: 'The one and only appearance of the legendary Dream Demons - featuring Bill Nelson.' And when we got there there were cars all up and down the street. But by the end of the night I was greatly enjoying myself and realised I had missed it and that I wanted a band again."

As a result *Bebop Deluxe* has been reformed - though Bill is the only original member - and the band plans an album and a tour later this summer. But before you start rummaging through your wardrobe for the flares and platform footwear, Bill says that only the name remains the same, and however trendy the 70s era is at the moment this is a progressive rather than regressive project. "I'm not trendy any more - that's great for the young kids who haven't been through it yet but I'm a bit disenchanted with nostalgia." The forthcoming album, he reveals, even has a working title - *Deep and Serious* - although the equally embryonic cover design would be 'hilariously whacky'.

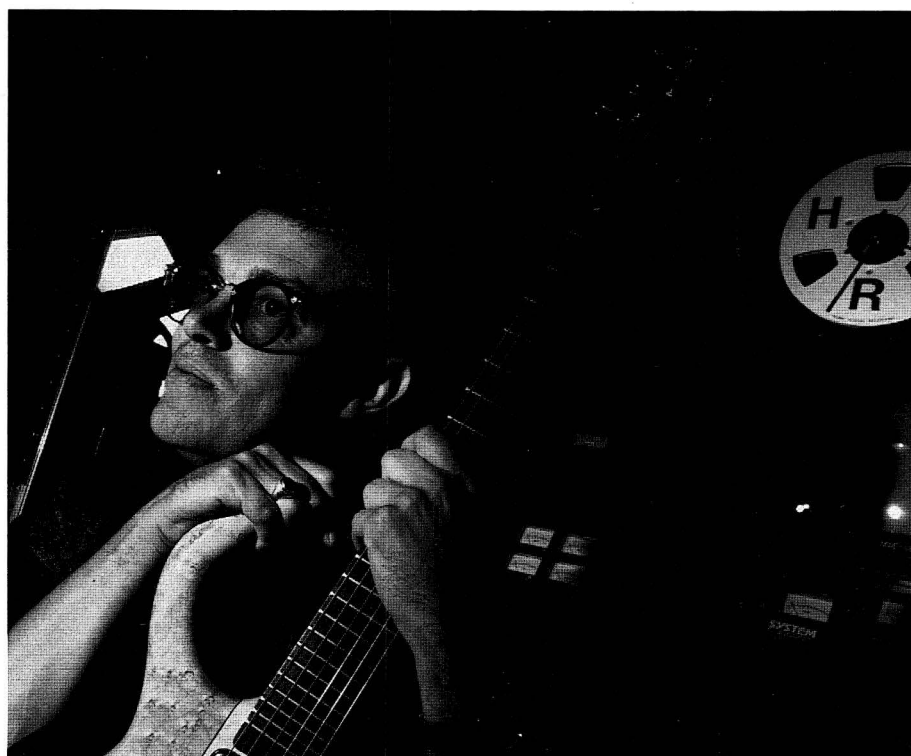


He's written 23 new songs - just about two whole working days worth on the Nelson scale - and has a group of musicians committed to the project. The new *Bebop* will use a mixture of conventional and electronic instruments. "We'll use a real drum kit but have electronic percussion as well - it's a nice combination of organic and techno stuff and gives that warmth without sounding too dated." He'll be playing lead guitar if and when this project takes off.

Bill's approach to hi-fi is conventional. He only bought a CD player at the end of 1988, as part of a stack of Technics separates and he doesn't aspire to esoteric

equipment. With a standard set-up he can listen to tapes he has just made upstairs in his own studio and get an idea of what they sound like on a normal domestic system. "I had a Garrard deck and Wharfedale speakers and I didn't even have a CD player. I said this is crazy; here am I listening to all this stuff on a really old system and I had to upgrade. But I don't spend a lot of time listening to other people's music anyway. You get to the point where you're so satiated with your own stuff that you don't have time for anyone else's."

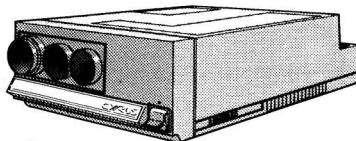
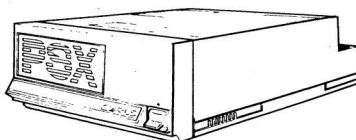
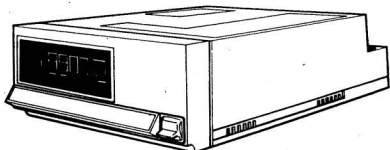
The Technics system is therefore set up in the Nelson's kitchen - on a sideboard - about as non-audiophile a setting as any I guess. There's far more evidence of 'hi-fi' activity in the studio at the top of the house. This is a kind of inner sanctum for Bill Nelson; it houses his recording equipment, stacks of old memorabilia and, behind a curtain, an altar strewn with books, talismanic objects and a couple of 'swords'. He candidly reveals that he practices Freemasonry and belongs to both the French Esoteric Order and Leeds branch of the Brothers of the Rosicrucion - a secret society apparently founded in Germany in 1610. He doesn't appear to have much time for English masonry preferring the 'magic' practised in these groups. He wears



The handmade Viellotte-Citron guitar - H G Wells couldn't have made a better machine for travelling back to the '70s.

music made live... music made live... music made live... music made live... music made live...

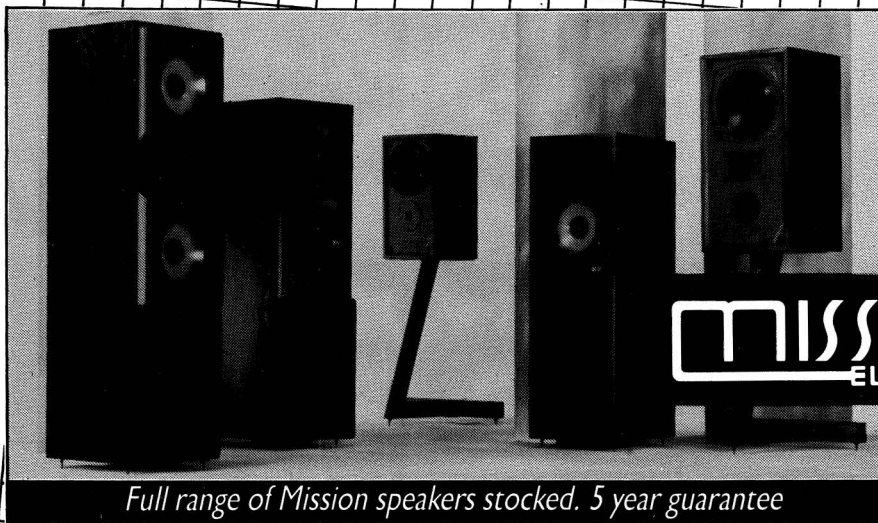
CYRUS



Full range of Cyrus products stocked. 3 year guarantee

STOCKISTS OF

- Aura
- ADC
- Arcam
- Aiwa
- Allison
- Audiolab
- B&W
- Cyrus
- Celestion
- Denon
- Dual
- Exposure
- Heybrook
- Infinity
- JPW
- JC
- Linn
- Marantz
- Mission
- Musical Fidelity
- NAD
- Nakamichi
- PRO-AC
- Quad
- Revolver
- Rotel
- Sony
- Tannoy
- Technics
- Wharfedale
- Yamaha



MISSION ELECTRONICS

Full range of Mission speakers stocked. 5 year guarantee



Price guarantee

If you can buy cheaper—including leads, cartridge, carriage and 3-Year Guarantee—we will match it. Prices correct for the life of this magazine, but are subject to change.



Free cartridge, cable, 3-year guarantee, carriage*

All systems supplied with cartridge, speaker cable and 3-Year Parts and Labour Guarantee. Carriage is FREE for UK Mainland*

Improved turntables (inc cart)

Dual CS 503-2 extra £103.00 · Dual CS 505-3 extra £59.00 · Revolver Rebel extra £67.00 · Revolver extra £116.00 · Rotel RP855 extra £77.00 · AREB101 extra £119.00.

CD instead of turntable front end

Denon DC D620 extra £103.00 · Denon DCD 820 Extra £163.00 · Denon DCD 920 extra £206.00 · Denon DCD H20 extra £271.00 · Marantz CD40 extra £103.00 · Marantz CD50 extra £163.00 · Marantz CD50SE extra £214.00 · Marantz CD60 extra £214.00 · Marantz CD60SE extra £256.00 · NAD 5320 extra £95.00 · NAD 5325 extra £120.00 · Rotel RCD 855 extra £146.00 · Technics SLP 202 extra £75.00 · Technics SLP 222 extra £113.00 · Technics SLP 333 extra £160.00 · Technics SLP 555 extra £208.00 · Yamaha CD 2⁹ extra £78.00 · Yamaha CDX 630E extra £103.00 · Yamaha CDX 710 extra £129.00 · Yamaha CDX 810 extra £189.00.

CYRUS

SIGNATURE

STOCKIST

3 year guarantee

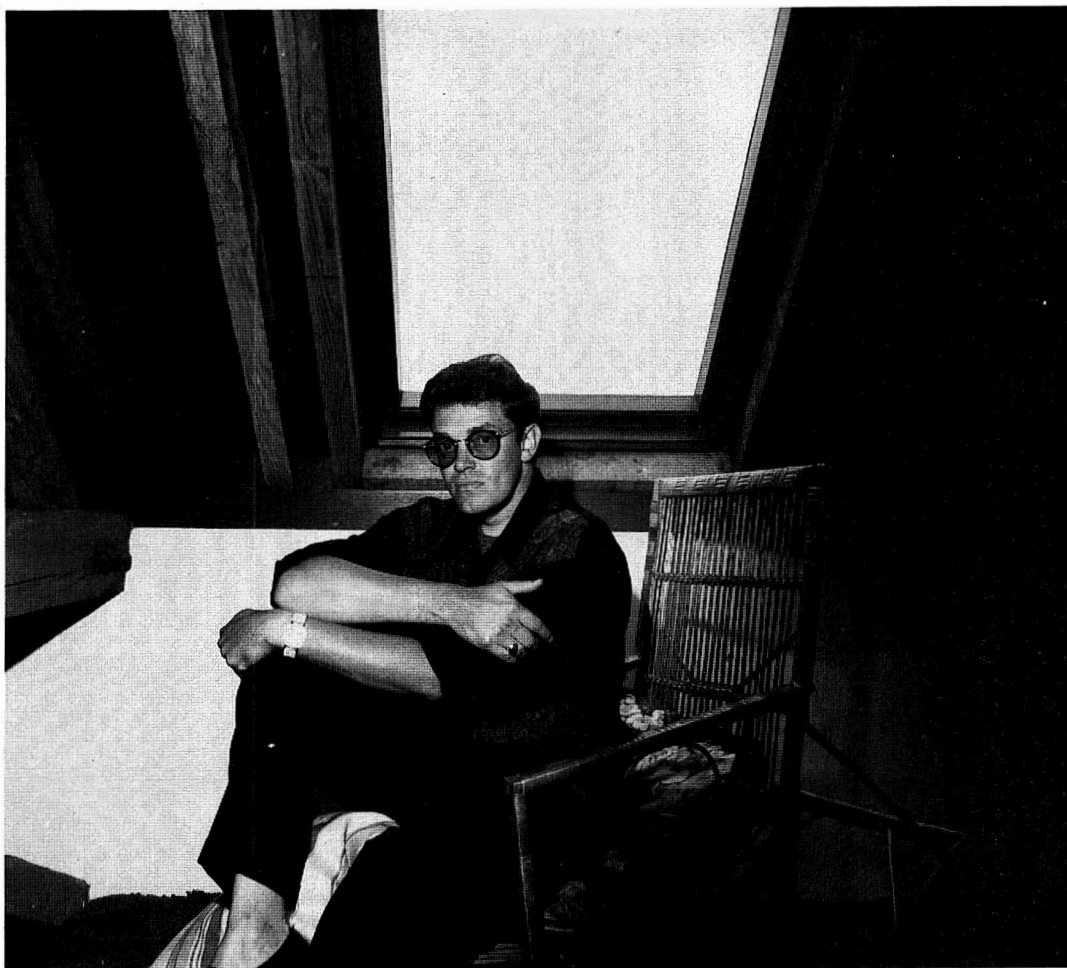
SUGGESTED SYSTEMS

	Amps		Speakers							
	Wharfedale Delta 30 JPW Minim	JPW Sonata Wharfedale Diamond 3	Celestion 3	Mission 761 Heybrook Point 5 TannoyEII JPWSonata+	Celestion DL 4II	B&WDM550 Celestion DL6 II Allison AL105	Tannoy M15 Infinity RS2001 Widale 505.2	Heybrook HBI Celestion- DL 8II Mission 762 Allison AL110 MF Reference 2	TannoyM20	
All systems come with Dual CS 430	Arcam Alpha II	308.95	327.95	337.95	356.95	367.95	387.95	402.95	417.95	457.95
	Denon PMA 250	258.95	276.95	285.95	293.95	310.95	323.95	344.95	361.95	386.95
	Denon DRA 325R	402.95	420.95	429.95	436.95	453.95	462.95	486.95	512.95	529.95
	NAD 7020E RECV	338.95	358.95	368.95	378.95	388.95	398.95	408.95	438.95	468.95
	NAD 3020i	273.95	291.95	301.95	308.95	326.95	333.95	354.95	371.95	396.95
	NAD 3240PE	374.95	392.95	401.95	408.95	425.95	433.95	450.95	478.95	501.95
	NAD 3225PE	280.95	298.95	307.95	314.95	331.95	340.95	366.95	382.95	407.95
	Rotel RA 810A	257.95	264.95	274.95	291.95	308.95	316.95	333.95	359.95	384.95
	Rotel RA 820AX	281.95	299.95	308.95	315.95	332.95	341.95	357.95	383.95	407.95
	Rotel RA 820BX4	315.95	333.95	342.95	349.95	366.95	375.95	382.95	408.95	476.95
	Rotel RA 840BX4	357.95	375.95	384.95	391.95	412.95	417.95	433.95	457.95	519.95
	Rotel RA 870BX	443.95	461.95	470.95	488.95	505.95	513.95	530.95	556.95	601.95
	Yamaha AX330E	263.95	281.95	290.95	298.95	316.95	323.95	344.95	361.95	386.95
	MF BI	353.95	370.95	378.95	387.95	403.95	420.95	438.95	455.95	481.95

BARTLETTS

175 HOLLOWAY ROAD, LONDON N.7. TEL: 01-607 2148/2296
 Access, Visa cards accepted. Demonstration by appointment. Please phone.
 Opening times: 9.30-6.00 Mon-Sat. 9.30-8.00 Thursdays.

E & OE



a masonic ring on his right hand. "I have been interested since I was about 16 but I only became involved in the early 80s – it's become part of my life now. I'm very matter of fact about it but it's not the sort of thing you can write about in a short piece."

Elsewhere models of gremlins, ET and the 'Alien' are perched next to bakelite radios, an old wind-up gramophone, a candle-making kit, some red-platform shoes and stacked up copies of *The Face* magazine. There's a pile of musical instruments – African drums, a sitar, a plethora of guitars, both electric and acoustic and a mandolin. His favourite guitar is a Viellotte-Citron handmade from a slab of Maple wood in New York. He started playing guitar at the age of 14 – copying records played at 15rpm and is coming back to it after concentrating mostly on keyboard playing.

The studio is set against the eaves of the house. Bill had only just moved in at the time of our visit and was still getting used to the acoustics of the new setting. "This room is acoustically very dead compared to my last house, so when I make a tape I have to take it into one of the other rooms in the house to get an idea of what it really sounds like," he said.

All the recording equipment is arranged in a semi-circle against one of the eaves with a mixing desk (Allen and Heath) in the centre, synthesisers (Yamaha) to the right and a stack of effects and recording equipment on the left. There are digital delay and reverberation systems, a com-



pressor and the Sony Betamax video recorder with a PCM digital processor. The Sony system was state of the art in its day (several years ago now), and was labelled as one of the first digital recording systems. A Fostex 16-track tape recorder allows frame by frame synchronicity for film scores, and the whole lot can be listened to on a pair of *Little Red Monitors* from Tannoy (or headphones).

Apart from the 16 track mixing desk the whole system is digital. Although he'll often pick up an acoustic guitar he believes that "people have become used to digital sounds and expect them to a degree. Digital and analogue do sound different but it's horses for courses". It looks

Glasses are worn for the look rather than to look.

a bit of a mish-mash, with wires hanging everywhere but this is the equipment used to record many of his albums, and it's a tribute to the Betamax that it can still deliver the goods of that sonic quality.

Whether Bill Nelson and his new colleagues can deliver the goods of sonic quality needed to re-establish a band called *Bebop Deluxe* in the limelight remains to be seen.

CONFIDENTIAL

FOR YOUR EARS ONLY

Systems of the month

£430 Rotel RA 820AX + Rotel RP 855 + J.P.W. Sonata = **£380**

£587 Creek 4140S2 + Marantz CD40 + Castle Warwick = **£527**

£824 Kelvin Labs Integrated + Marantz CD50SE + Tannoy M20 = **£724**

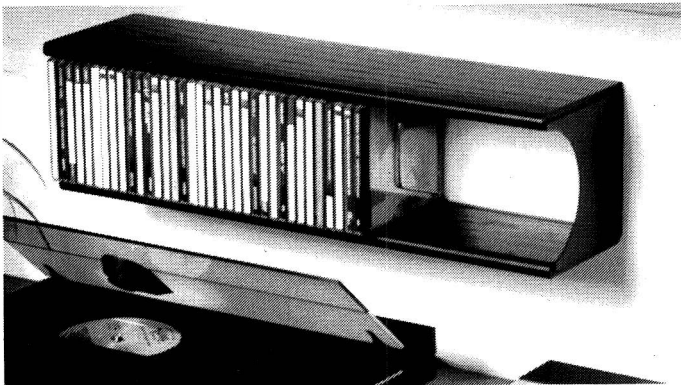
Authorised dealers of:

Alphason, Ariston, Alexander, ATC, Audio Innovations, Audio Technica, Beard, B&W, Cambridge Audio, Creek, Celestion, Carver, Castle, Chord Company, Dual, Denon, Heybrook, Hafler, Infinity, J.P.W., Kelvin Lab, Mantra/Musician, Mission, Musical Fidelity, Mordaunt-Short, Moth, Marantz, Monster Cable, Nackamichi, Orell, Oracle, Presence Audio, Proac, Proton, Philips, Quad, Ruark, Rotel, Sennheiser, S.D. Acoustics, SME, Snell, Spondor, Sony & Sony ES, Systemdek, Target, Tannoy, Thorens, van den Hul and Yamaha.

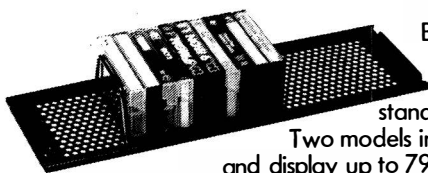
Single Speaker Demonstration Room
Round the Corner from the Parliament House.

**35-37 MARSHAM STREET,
LONDON SW1P 4LA**

Tel: (01) 233 0774 Fax: (01) 233 0773



DESIGNER STORAGE for CASSETTES and CDs



Trakrak Shelves.

Beautiful in Black Ash.
Elegant. Practical.
Adjustable. Free
standing or wall mounted.

Two models in two lengths to store
and display up to 79 CDs or 49 cassettes.

Trakrak Trays. Stylish and inexpensive in black
perforated metal. Shining steel sliders. Choice of models
to hold up to 40 CDs or 25 cassettes.

To Beaver & Tapley Ltd FREEPOST Southall Middlesex UB2 4BR.

Please send me the TRAKRAK brochure

Name _____

Address _____

TRAKRAK

DATASOUND

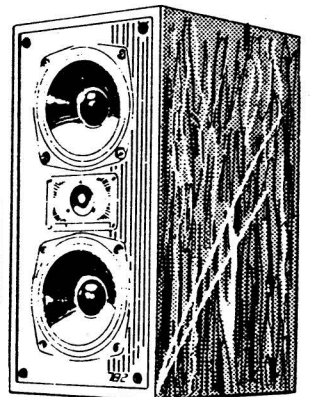
HI-FI in DORKING

23 SOUTH ST
DORKING,
SURREY.

(0306) 882897.

STOP PRESS!
MISSION CYRUS
TUNER ON
DEMONSTRATION
NOW!

MISSION ELECTRONICS



LISTEN TO THE NEW RANGE OF
MISSION LOUDSPEAKERS TOGETHER
WITH THE SUPERB CYRUS ELECTRONICS
IN THE COMFORT OF OUR LISTENING ROOM

WE ARE AGENTS FOR:

- ACOUSTIC ENERGY ■ AIWA ■ AR ■ ARCAM ■
- ARISTON ■ B+W ■ CAMBRIDGE
- CELESTION ■ DENON ■ DUAL ■ HECO ■
- HEYBROOK ■ JPW ■ KENWOOD ■ MARANTZ
- MISSION ■ MUSICAL FIDELITY ■ NAD ■
- ONKYO ■ PANASONIC ■ PROAC ■ QED
- ROTEL ■ SENNHEISER ■ SONY ■ TANNOY
- TARGET ■ TECHNICS

- EXTENSIVE RANGE OF POPULAR AND CLASSICAL CD'S
- ALL MAJOR CREDIT CARDS ACCEPTED
- UPTO £1000 INSTANT CREDIT (SUBJECT TO STATUS)



**COMPACT DISC &
HI-FI ACCESSORY SHOP**

in

CHICHESTER, W.SUSSEX.

■ All Pop & Rock CD's
ONLY £9.99

31 SADLERS WALK
CHICHESTER

TEL: (0243) 533963.

DATASOUND

HI-FI CHOICE

Special Introductory Charter Subscription Offer!

SAVE 40%
ON NEWS STAND PRICES!

NEWS STAND PRICE ~~£35.40~~
12 Issues UK

SUBSCRIPTION
PRICE – ONLY **£19.95!** 12 Issues UK

Hi-Fi Choice is the world's number 1 guide to buying Hi-Fi. Packed with reviews, news and features in a brand new colour section, Hi-Fi Choice is the magazine if you are serious about Hi-Fi.

Take advantage of our special Charter Subscription Offer and Hi-Fi Choice can be yours for just **£19.95*** a year (a saving of **£15.45** on news stand prices!) — including priority despatch to your home.

*UK

What you get

- 12 monthly issues of the world's finest hi-fi magazine
- Priority despatch to your door (this means that you will always get Hi-Fi Choice before it appears in the shops)
- Special reader offers
- Low cost renewals offers
- Full lab and listening tests on over 700 products.

Hi-Fi Choice Subscription Hotline
For credit card orders and
subscription enquiries
Telephone 01-580 8908
Fax 01-636 5668
Telex 8954139 DENNIS G

Subscriptions Department DPL/C,
Hi-Fi Choice,
FREEPOST,
Mitcham,
Surrey CR4 9AR.

Yes! I want to save over £15 by subscribing to Hi-Fi Choice, the world's number 1 guide to buying Hi-Fi.

Please start my subscription from the next available issue.

Please tick the appropriate boxes:

- UK **£19.95**
 Europe/Eire **£24.95**
 Rest Of The World **£29.95**

I enclose my cheque/Postal Order made payable to **Dennis Publishing Ltd***

Please charge my **Access*/Visa*/American Express*/Diners Club***

account number _____

Expiry Date _____

Signed _____

*Please delete as appropriate

Unless paying by credit card, all payments must be drawn in sterling on a UK bank. Using your credit card ensures that your subscription will start without delay!

Please send my copies of Hi-Fi Choice to-

Name _____

Company _____

Address _____

Postcode _____

Telephone _____

If you are paying by credit card, simply detach this card and pop it in the post. If paying by cheque or Postal Order, send this card with your payment to the FREEPOST address (UK Only)
Subscriptions Department, Hi-Fi Choice, 120-126, Lavender Avenue, Mitcham, Surrey CR4 3HP.

This information will be added to our mailing list. If you would prefer not to receive details of special offers and promotions, please let us know.

THE CHOICE DEALER DIRECTORY

Choosing a good hi-fi dealer is the most vital step in acquiring the system that is right for you. This unique directory gives full information on dealers in your area.

AVON

RADFORD HI-FI, 52-54 Gloucester Rd, Bristol. (0272) 428247. Linn, Naim, Mission, Denon, Nad. 3 dem rooms. Installation. Access, Visa + credit. Service dept. BADA MEMBER

ABSOLUTE SOUND AND VIDEO, 65 Park St, Clifton, Bristol. (0272) 264975. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER

PAUL GREEN HI-FI LTD, Kensington Showrooms, London Road, Bath. (0225) 316197. Linn, Musical Fidelity, Krell, A&R, Creek, Rogers, Quad, Cust. car park. Best selection in the West. BADA MEMBER

RICHER SOUNDS, 20 Cotham Hill, Bristol BS6 6LF. (0272) 734397. City-centre budget hi-fi discounts; most popular 'majors' from A to Z and all points in between; monthly 'specials'. Facilities: expert advice; free monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sats 10-5. Access, Visa, Richer ChargeCard and cheques up to £1,000 (subject to simple clearance).

BEDFORDSHIRE

ASHTON AUDIO, 6 High Street, Dunstable. (0582) 608003. AR, Cambridge Audio, Denon, Incehatec, JVC, Kenwood, Marantz, Monster, NAD, Nakamichi, etc. Credit to £1,000. Access, Amex, Diners, Visa. Service dept. Dem room facilities. Open 6 days, 9-5.30, 6p.m. Friday.

CAMBRIDGE HI-FI, 31 Cuthbert St, Bedford. (0234) 325035. Mission-Cyrus, Rotel, Kenwood, Pioneer, Mantecore, Revolver, Ariston, ITL, KEF, Monitor Audio. Single speaker dem room. 9.30-5.30 6 days. Free installation. Service Dept. Visa, Access. Credit facilities.

BERKSHIRE

NEWBURY AUDIO, 2 Weavers Walk, Northbrooke Street, Newbury, Berkshire RG13 1A1 (0635) 33929. 6 days 9.30-6.00. Linn, Naim, Roksan, Exposure, Creek, Epos, Royd, Denon, Nakamichi. Single speaker dem. room. Appts. necessary. Home trial facilities. Free installation. Service department. Late appointments. Access, Visa. Interest free credit subject to status. 6 days 9.30am-6.00pm.

READING HI-FI CENTRE, 4 Queen's Walk, Reading RG1 7QF. (0734) 585463. 'The best equipment, advice and service from Berkshire's premier Hi-Fi emporium'. BADA MEMBER

BUCKINGHAMSHIRE

TECHNOSOUND, 7 Graville Square, Willen Centre, Milton Keynes. (0908) 604949. Bang & Olufson, Denon, Rotel, Technics, Yamaha and enthusiast hi-fi. Also at Luton and Dunstable. BADA MEMBER

AUDIO INSIGHT LTD, 53 Wolverton Rd, Stony Stratford, Milton Keynes. (0908) 561551. Arcam, Audiolab, Heybrook, Ion, Linn, Meridian, Quad and more. Access, Visa. Finance. Dem. room etc. BADA MEMBER

AYLESBURY HI FIDELITY, 98 Cambridge St, Aylesbury. (0296) 28790. Denon, Dual, Exposure, Heybrook, Marantz, Musical Fidelity, NAD, Roksan, Rotel, Systemdek. 2 Dem rooms, appointment reqd. Mon-Fri 10-6, Sat 9.30-5.30. Home trial, free installation, credit to £1,500. Access, Amex, Diner, Visa. Service dept.

CAMBRIDGESHIRE

CAMBRIDGE HI FI, 1 Hawthorn Way, Cambridge. (0223) 67773. Ariston, ITL, KEF, Mission Cyrus, Monitor Audio, Pioneer, Revolver, Technics, Thorens, Kenwood. All credit cards.

STEVE BOXSHALL AUDIO, 41 Victoria Rd, Cambridge CB4 3BW. (0223) 68305. 10-6 - 6 days. 3 dem rooms, home trial, appts. preferred. Free installation and service dept. Access, Visa & credit. BADA MEMBER

STILTON AUDIO, 489 Lincoln Road, Peterborough. (0733) 558838. A&R, Cyrus, Exposure, Harman Kardon, Linn, Meridian, Mission, Musical Fidelity, Roksan, Yamaha. Home trial, free installation. Credit facilities. Access, Visa, Amex. Mon-Fri 10-6. Sat 10-5.30. Service dept.

CHESHIRE

ASTON AUDIO, 4 West St., Alderley Edge. (0625) 582704. Wide range of specialist audio, interest free credit. Visa, Access. Home trial. Closed Mon. BADA MEMBER

DOUG BRADY HI-FI, Kingsway Studios, Kingsway North, Warrington. (Padgate 0925) 828009. 'Largest choice of specialist Hi-Fi in N.W.'. All credit cards. 3 Dem rooms. Open 6 days. BADA MEMBER

NEW DAWN HI-FI, 1-3 Castle St, Lower Bridge St, Chester. (0244) 24179. Linn, Quad, Technics, National Panasonic, Denon, Rotel, Dual, Meridian, Aiwa, Philips. SWIFT OF WILMSLOW, 4-8 St Annes Parade, Wilmslow. (0625) 526213. Arcam, Denon, Kenwood, Musical Fidelity, Marantz, NAD, Cambridge. 2 dem rooms. Tues-Sat 9.15-6pm. No pressure! BADA MEMBER

RICHER SOUNDS, 4 Wellington St, Stockport SK1 3RN. (061) 480 1700. Cheerful small store by BR station with virtually all major 'budget' names; many on special offer. Facilities: expert advice; free monthly Newsletters; part exchange. Mon-Fri 10-6, Sats 10-5. Access, Visa, Richer ChargeCard and cheques up to £1,000 (subject to simple clearance). Mail Order for all Richer Sounds stores from this branch.

CHRIS BROOKS HI-FI, 29 Gaskell St, Stockton Heath, Warrington. 0925 61212/3. Tues-Sat 10-6. 2 dem rooms. Credit facilities. All credit cards. Total absence of bull****. BADA MEMBER

CUMBRIA

LAKELAND HOME MUSIC, "Fair Place" (200yds past church), Water millock, Penrith. Call OLR 07684 86235. Hear the full Quad range and ATC SCM 50A monitors here (B&B available), or in your own home, without obligation, in N. England and Scotland. Castle, Spendor, Sugden, Marantz, Townshend, Kelvin Labs, Primare, Sumo and compact discs available.

DERBYSHIRE

ACTIVE AUDIO, 12 Osmaston Rd, The Spot, Derby. (0332) 380385. Arcam, Ariston, Celestion, Denon, Kef, Kef Reference, Cyrus, Marantz, Revox, Rotel, Rogers, etc. Meridian Musical Fidelity. Account and credit cards. Ring for opening times and free 'Fact Pack'. BADA MEMBER

THE ONLY BADA MEMBER in Derbyshire.
LISTEN HEAR! LTD., 1a Regent Street, Ilkeston, Derbyshire. (0602) 304602. Quad, Heco, Harman Kardon, Marantz, Sugden, Spendor, Ruark, Revolver, Denon, BLQ. One single speaker demonstration lounge. Home demonstrations. Free installation. Access, Visa, Diners. Licenced credit brokers. Open 9.30-6 daily except Weds 9.30-1.

DEVONSHIRE

CHELSTON HI-FI, 38 Walnut Road, Chelston, Torquay, Devon TQ2 6HS. Tel: (0803) 606863. Denon, Marantz, Rotel, Musical Fidelity, Acoustic Energy, NAD, Castle, Heybrook, Celestion, JPW etc. 2 dem rooms. Home trial. Free installation. Access, Visa, Amex, Diners, Hi-Fi Markets Chargecard. Credit facilities. 9.30-7.30 Mon-Fri, 9.30-6 Sat.

DORSET

THE AUDIO SHOP, 128 Poole Road, Westbourne, Bournemouth. (0202) 762160. Arcam, Quad, Michell, Marantz, Linnx, Celestion, Spendor, Cambridge Audio, Absolute Sounds, Roksan. 2 dem areas. Home trial. Free installation. Access, Visa. Tues-Fri 10-6, Sat 9-5.

ESSEX

A.T. LABS, 442/4 Cranbrook Rd, Gants Hill, Ilford. (01) 518 0915. Mon-Sat, 10-6. Two dem rooms. Access, Visa. Sony Hi-Fi News Best Dealer '86 & '88 (National). BADA MEMBER

RAYLEIGH HI-FI, 44a High Street, Rayleigh, Essex. (0268) 779762/747571. 216 Moulsham St, On-the-Parkway, Chelmsford, Essex. (0245) 265245. A&R, Creek, Cyrus, Denon, Epos, Ion, Linn, Mission, Naim, Quad, Rega, Roksan, Rotel, Royd, 0% finance. BADA MEMBER

BRENTWOOD MUSIC & HI-FI CENTRE, 2 Ingrave Rd, Brentwood. (0277) 221210. Alphason, B&W, Cambridge Audio, Denon, Harman Kardon, Marantz, QED, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9.30-5.30 (Thurs from 10am, Sat from 9am). Free installation, credit facilities. Access, Visa, Hi-Fi Markets. Service dept.

LYON AUDIO, 16 Peartree Business Centre, Peartree Road, Stanway, Colchester, Essex CO3 5JN. (0206) 560259. Quad, Rogers, Mission, Denon, Cyrus, Marantz, Audiolab, Heybrook, Rotel, NAD. Dem facilities. Mon-Sat 9-6. Installations. Access, Visa, Hi-Fi Markets, Instant credit. Service dept available.

PRO MUSICA, 6 Vineyard Street, Colchester. (0206) 577519. Linn Products, Naim Audio, Rega Research, Creek, A&R Cambridge, Ion Systems, Denon, Rotel, Epos,

Ruark etc. Two single speaker dem rooms. Credit facilities. Access, Visa. Appointments bookable. Mon-Sat 10am-6pm.

THOMSONS, 2 High Street, Great Baddow, Chelmsford, Essex. Tel (0245) 71465. JVC, Kenwood, Mitsubishi, Toshiba, Tannoy, Mordaunt-Short, Acoustic Research, Wharfedale, Philips, Audio-Visual dealer. Home trial. Free installation. Service dept. Access, Visa, HP. Open 9-1, 2-5.30 Mon-Sat. Open 9-1 Wed.

GLOUCESTERSHIRE

ABSOLUTE SOUND AND VIDEO, 40/42 Albion St, Cheltenham. (0242) 583960. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER

AUDIO EXCELLENCE, 58 Bristol Road, Gloucester. (0452) 30046. Audio Research, Dual, Krell, Linn, Magneplanar, Naim, NAD, Yamaha and lots more. Closed Mon. BADA MEMBER

ROBBS OF GLOUCESTER, 13/15 Worcester Street, Gloucester GL1 3AJ. Sony, Technics, Aiwa, Pioneer, Denon, Bose, Celestion, Dual, Kenwood, JVC. Largest selection in Gloucestershire. Dem facilities. Home trial. In house service dept. Access, Visa. 9-5.30 6 days.

HAMPSHIRE

ABSOLUTE SOUND AND VIDEO, 4 Feathers Lane, Basingstoke. (0256) 24311. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER

HAMPSHIRE AUDIO Ltd, 2-12 Hursley Rd, Chandlers Ford. (0703) 252827/265232. Quality CD and analogue agencies. 5 dem studios. Large free car park. BADA MEMBER

HOPKINS HI-FI, 38/40 Fratton Rd, Portsmouth PO1 5BX. (0705) 822155. Technics, Quad, Monitor Audio, Tannoy, Denon, NAD, Heybrook, Onkyo, Dual, Marantz plus others. Dem facilities, appointments necessary. Access, Visa. 9-5.30. Open to 6 Thurs. Closed Wed. Service dept.

HEREFORDSHIRE

ENGLISH AUDIO, 95 Whitecross Road, Hereford. (0432) 355081. Musical Fidelity, Pink Triangle, Heybrook, Arcam, Nakamichi, Systemdek, Denon, Cambridge Audio, Rogers and others. Dem room. Home trial. Free installation. Service dept. Access, Visa. Open Mon-Sat 10am-6pm.

HERTFORDSHIRE

AUDIO IMAGE, 15 Middle Row, Stevenage, Herts SG1 3AW. Tel: 0438 360606. Aiwa, Goodmans, Harman Kardon, JBL, JVC, Kenwood, Panasonic, Pioneer, Sony, Technics. Dem room & lounge. Home trial. Free installation. Service dept. Access, Visa. Instant credit £1500. Closed Weds. Open 9-6.

ACOUSTIC ARTS Ltd, 101 St Albans Rd, Watford, Herts. (0923) 45250. A&R, Audiolab, Denon, Magneplanar, Quad, Rogers, Meridian, TDL, Jadis, Krell. Mon-Sat 9.30-5.30. BADA MEMBER

THE AUDIO FILE, 27 Hockerill St, Bishops Stortford, Herts CM23 2DH. (0279) 506576. 9.30-5.30 6 days. Dealer Of The Year 1988/89. Linn, Naim, Rega, Quad, Cyrus, Arcam, Musical Fidelity. 0% credit. BADA MEMBER

HYPERTEC, 6 Bancroft Road, Hitchin, Herts. (0462) 452248. B&W, Denon, Dual, Marantz, Pioneer, Rotel, Tannoy, Technics, Wharfedale, Bang & Olufsen. 2 dem rooms without appointment. Private dem room with appointment. Home trial. Free Installation. Service dept. Access, Visa, Hypertec creditcharge. 9.30-5.30 6 days per week. Evening dem by appointment.


W. DARBY & CO (TB) Ltd, 6 Market Place, near the clock tower, St. Albans, Herts. (0727) 50961. Alphason, A&R Cambridge, Bang & Olufsen, Denon, JPW, JBL, Harman Kardon, Quad, Ruark, Sony, Yamaha. Home demonstrations, free delivery and installation. Sales rental service. In house credit. Lombard, Tricity. Mon-Sat 9-6.

ISLE OF MAN

ISLAND COMPACT DISC CENTRE, Parliament Square, Ramsey. (0624) 815521. Arcam, Ariston, Audio Innovations, Celestion, E.A.R., Marantz, QED, SD Acoustics, Snell, Sugden. Mon-Sat 9-5.00. Dem and home trial facilities. Free installation. Full credit, no limit. Access, Elite. Service dept.

KENT

JOHN MARLEY HI-FI CENTRES, 2 Station Rd West,

Canterbury. (Canterbury) 69329. Also at Dover - (0304) 207562. B&W, Heybrook, Magnum, M.Y.S.T., Nakamichi, Pink Triangle, Rotel, Sansui, Technics, Quad. Dem and home trial facilities. Mon-Sat 9-5.30 closed Thurs. Free installation. Credit to £1,000. Access, Visa, Creditcharge. Service dept.
VJ HI-FI, 29 Guildhall St, Folkestone. (0303) 56860. Mon-Sat 9-6. NAD, Yamaha, Marantz, Cambridge Audio, Denon, Kenwood, Rogers, Dual, Musical Fidelity, Quad. Dem and home trial facilities, free installation, credit to £1000. Amex, Diners, Visa, Access. Service dept.
PHOTOCRAFT HI-FI, 40 High St, Ashford. (0233) 624441. No. 1 in Kent for Linn, Naim, Rega, Roksan, Exposure, Onix, Epos, Royd, Creek. But before you choose equipment choose where to buy it. Dem room, appts. necessary. Home trial and free installation. Visa, Access, Bada Chargecard. 9-5.30 Mon-Fri (Wed & Sat to 5 only). Service Dept. **BADA MEMBER** 

LANCASHIRE

MONITOR SOUND, 54 Chapel St, Chorley. (02572) 71935. A&R, Dual, Mission, Quad, Rogers, Rotel, Spondor, Thorens, Nakamichi, Yamaha, etc. 2 dem rooms. Open Mon-Sat, closed Weds. Free installation. Credit to £1,000. Access, Visa. Service dept.


LEICESTERSHIRE


MJS HI-FI, 80 Stapleton Lane, Barwell, Leicester LE9 8HE. (0455) 46977. The Rock, Audio Innovations, Kelvin Labs, Snell, Helius, Sugden, Ruark, Concordant, Valdi, JPW. Our main aim is for our customers to enjoy music. Dem and home trial facilities. Mon-Sat 9.30-7.00. Free installation and service dept. Visa, Access.
THE LEICESTER HI-FI CO, 6 Silver Walk, St. Martins Square, Leicester LE1 5EW. (0533) 539753. Arcam, Creek, Marantz, Mission/Cyrus, Musical Fidelity, Nakamichi, QED Hi-Fi, Quad, Rogers, Roksan, "and oodles more". Largest selection in East Midlands. 2 dem rooms, home trial arranged, free installation service department, credit facilities, Hi-Fi Markets, Access, Visa, Diners, Amex. 6 days 9.30-5.30.

LINCOLNSHIRE


BOSTON HI FI CENTRE, 65a Wide Bargate, John Adams Way, Boston, Lincs PE21 6SG. (0205) 65477. Quad, Nakamichi, Creek, Arison, NAD, Denon, Marantz, Castle, JPW, B&W. Separate demo studio. Home trial, free installation, service department. Access, Visa, Hi-Fi Markets Chargecard. Tues-Sat 9-5.30 pm.


LONDON

A.T.LABS, 190 West End Lane, London NW6. (01) 794 7848. Mon-Sat 10-6. Two dem rooms. Access/Visa. Sony Hi-Fi News Best Dealer '86 & '88 (National). **BADA MEMBER** 

AUDIO T, 190 West End Lane, London NW6. (01) 794 7848. Mon-Sat, 10-6. Two single speaker dem rooms. Access, Amex, Visa. **BADA MEMBER** 
CORNFLAKE SHOP, 37 Windmill Street (just off Tottenham Court Road), London W1. (01) 631 0472. Mon-Sat 10-7. Rega, Roksan, Naim, Monitor Audio, Koetsu, Marantz, Yamaha, SME, DNM, Epos. Three dem rooms, friendly, knowledgeable service. We design and install multi-room systems. Delivery and installation service. Credit facilities. Access, Visa.

DIN, 25 Melcombe Street, London NW1 6AG. Tel: (01) 224 4413. Roksan, Quad, Denon, Meridian, Mission, Celestion, Krell, Apogee, Arcam, Nakamichi. Full demonstration and delivery. Free installation. Access, Visa, Amex, Diners.

DOUG BRADY HI-FI, 14-18 Monmouth St, London WC2H 9HB. (01) 379 4010. Wide range of top specialist hi-fi from Britain, America and Japan. 3 Dem rooms. **BADA MEMBER** 

GRAHAMS HI-FI, Canonbury Yard, 190a New North Rd, London N1 7BS. (01) 226 5500. Winner Sony/HFN Greater London Dealer Award 1986-1989. Linn, Naim, Rega etc. \$300-\$3,000-£13,000. **BADA MEMBER** 

HI-FI CONFIDENTIAL, 35/37 Marsham St., London SW1. (01) 233 0774. Open Mon-Fri 10-6, Sat 10-3. Creek, Denon, Hafler, Kelvin Lab, Musical Fidelity, Oracle, Quad, Rotel, S.D. Acoustic, S.M.E. etc. Large single speaker dem room. Limited home trial facilities. Export worldwide.

JUST MUSIC, 52 Upper Tooting Road, London SW17 7PB. 01 767 1233. Aiwa, Dual, Denon, Marantz, Quad, Rogers, Thorens, Musical Fidelity, Sugden, Heybrook and many more. Dem facilities. Appts can be arranged. Home trial. Free installation available. Access, Visa, Amex, Hi-fi Markets, Chargecard, Creditcharge, finance arranged. 10am-7pm Mon-Thu, 10-6 Fri & Sat.

KAMLA ELECTRONICS, 251 Tottenham Court Road, London W1. (01) 323 274. Amadens, Arison, BLQ, Gale, Incatech, JPW, Linn, Mordaunt Short, SME, Systemdek, Thorens, Townshend, Ruark, Wharfedale.

KJ WEST ONE, 26 New Cavendish St, London W1M 7LH. (01) 486 8262/63. Fax (01) 487 3452. Arcam, Audio Research, Croft, Epos, Linn, Marantz, Musical Fidelity, Quad, Systemdek, Voyd. 2 dem studios. Appts. nec. Home

trial. Free installation. Service dept. Major credit cards. Mon-Sat 10-6pm. (Late night Thursday til 7pm).

NICHOLLS HI-FI, 430-434 Lee High Street, Lewisham, London SE12 8RW. (01) 852 5780. Sony, Technics, Harman, JBL, Mordaunt Short, Kenwood, Panasonic, Hafler, Sumo, B&W. Dem facilities. Home trial. Free installation. Service dept. Credit available. Visa, Access. 9.30-6 Mon-Sat, Thurs till 1 o'clock.


ORPHEUS HOME DEMONSTRATIONS. (01) 299 0075. Alexander, Alphason, Cadence, Castle, Kiseki, Moth, Proton, Thorens, Townshend, Systemdek. Home demonstrations only. Appts. necessary. Home trial, free installation. Service dept. Three month interest free credit. Open 24 hours. All goods guaranteed two years.


RICHER SOUNDS 2, London Bridge Walk, London SE1 2SX (on walk way over Duke St Hill, not in A-Z). (01) 403 1201/4710. Virtually every major name, small busy store, with big discounts and numerous special offers. Facilities: expert advice, free 48 page hi-fi guide, and monthly newsletters. Mail order, part exchange. Mon-Fri 10-6, Thurs and Fri late til 7pm, Sat 10-5. Access, Visa, Richer Card. Cheques up to £1,000 (subject to simple clearance).


RICHER SOUNDS, 25 Northways Parade, College Crescent, Swiss Cottage NW3 (bottom of Fitzjohn's Avenue). (01) 722 3359. Friendly North London store stocking the A-Z of popular hi-fi at amazing discount prices. Facilities: expert advice, free monthly newsletters. Mail order, part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer Card. Cheques up to £1,000 (subject to simple clearance).


THE SOUND SHOP, 58 The Broadway, Mill Hill, London NW7. (01) 906 3364. Denon, Kenwood, JPW, Marantz, Monitor Audio, Musical Fidelity, NAD, Ruark, SD Acoustics, Tannoy etc. Home trial. Free installation. Service department. Access, Visa, Amex, Diners. Credit facilities. \$1000 instant credit. 10-6 Mon-Sat.

MIDDLESEX

A.T. LABS, 173-175 Station Rd, Edgware, Middx. (01) 952 5535. Mon-Sat 10-6. 2 dem rooms. Access, Visa. Sony/Hi-Fi News Best Dealer '86 & '88 (National). **BADA MEMBER** 

UXBRIDGE AUDIO LTD, 278 High St, Uxbridge, Middx UB8 1LZ. (0895) 30404 (Multi-line). A&R, AR, Arison, Creek, Cyrus, Denon, Dual, JPW, KEF, Manticore, Meridian, NAD, Nakamichi, Quad, Rotel, Wharfedale, Yamaha, etc. 2 dem rooms. Mon-Sat 10-6. **BADA MEMBER** 

HARROW AUDIO, 27 Springfield Rd, Harrow. (01) 863 0938. Mon-Sat 9.30-5.30. A&R, Audiobal, Cyrus, Denon, Dual, Heybrook, Linn, Monitor Audio, Musical Fidelity, Quad, Rotel, Tannoy etc. **BADA MEMBER** 

A.T.LABS, 159 Chase Side, Enfield, Middx. (01) 367 3132. Mon-Sat 10-6. Two dem rooms. Car Park. Access/Visa. Sony/Hi-Fi News Best Dealer '86 & '88. **BADA MEMBER** 

MERSEYSIDE

IN CONCERT HI-FI, 144 Seaview Road, Wallasey, Wirral, Merseyside. (051) 630 5055. Denon, Kenwood, QED, Alexander, Spica, Shan Acoustics, Monitor Audio, Tannoy, Audio Dynamics, Dual, Systemdek, Audio Technica, Target, Musical Fidelity, Audio Dimensions, Voyd. Single speaker dem room. Home trial + free installation. 10-6 - closed Mon. Open till 8pm Thurs and Fri. Access + Visa. W.A. BRADY & SON, 401 Smithdown Rd, Liverpool L15 3JJ. (051) 7336859. Largest choice of specialist Hi-Fi in N.W. £100-£20K+. All credit cards. 3 dem rooms. Closed Monday. **BADA MEMBER** 
PURE SOUND - Birkenhead 051 645 6690 24hrs. Acoustic Energy, Aragon, Audio Technica, Beard, Celestion, Deltec, Denon, Michel, Cyrodec, Ortofon. Home demonstration a pleasure, plus evenings and weekends (Sundays by appointment).

RICHER SOUNDS, 99 Renshaw Street, Liverpool L1 2ST. (051) 708 7484. Virtually every major 'budget' name - small store with big discounts and special offers. Facilities: expert advice; free monthly newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard and cheques up to £1,000 (subject to simple clearance).

NORFOLK

BASICALLY SOUND, The Old School, School Rd, Bracon Ash, Norwich NR14 8HE. (0508) 70829. Arcam, Linn, Naim, Denon, Spondor, Heybrook, Audio Technica, Creek, Rega, Epos, etc. 2 comprehensive dem rooms. Home trial. Free installation. Visa, Access. HP facilities. Tues-Sat 9.30-1, 2-5.30.

SOUND APPROACH, 161 Unithank Road, Norwich. (0603) 622833. Kuzma, Arison, Castle, Denon, Exposure, Ion, Royd, NVA, Roksan, Ruark, etc. etc. Dem and home trial facilities. Mon-Sat 9-6.30. Free installation. Credit to £1,500. Visa, Access, Diners Club. Service dept.

NORTHAMPTONSHIRE

CLASSIC HI-FI + VIDEO, School Lane, Kettering, Northants. (0536) 515766. Cambridge Audio, Marantz, Creek, Trio Kenwood, Harman Kardon, Onkyo, Kef, Celestion, Bose, Wharfedale and many more. Home trial, free installation, service dept. Access, Visa, credit facilities. 9.30-5.30pm.

THE AUDIO SHOP, Coffee Tavern Court, High St, Rushden. (0933) 56651. Audio Technica, Denons, Goodmans, Rotel, Tannoy, Ion Systems, Thorens, Gale, BLQ, Royd. Dem room. Home trial and free installation. Mon-Sat 9.30-5.30 (Thurs 9.30-2). Service dept.
SOUND PRINCIPLES, 52 Queen Street, Wellingborough, Northants. (0933) 441907. Aura, Celestion, Heybrook, Marantz, Mission, Nakamichi, QED, Rotel, Spondor, Systemline, Yamaha and others. Demo room. Home demo's by appt. Apts advisable. Free installation. Access, Visa + credit scheme available. Mon-Fri 10-6, Sat 9-5. Out of hour appts can be made.


NOTTINGHAMSHIRE


DEFINITIVE AUDIO, Nottingham. (0602) 813562. Voyd, Valdi, Systemdek, Helius, Audionote, Golding, JPW, Snell, Target, Pirate. Home demonstrations throughout Nottingham and East Midlands. Please telephone (0602) 813562 for further information.


CHANTRY AUDIO, Chantry Walk, 18a Eldon Street, Tuxford, Newark, Notts NG22 0LH. (0777) 870372. Arison, ADC, Gale, Infinity, JPW, Kelvin Labs, Proton, Rotel, Space Acoustics, Thorens. Single speaker dem room. Appts preferred. Home trial, free installation. Access, Visa + credit facilities. Mon-Fri 10am-4pm. Sat 9-30-5.30. Sun home dem by appt. Closed Weds.

WEST MIDLANDS

ALTERNATIVE AUDIO Ltd, 93-95 Hobs Mount Rd, Solihull. (021) 742 0254 (sales), 0248 (service). The widest range of quality hi-fi and CD in the West Midlands. Tues-Sat 10-6. **BADA MEMBER**

GRIFFIN AUDIO Ltd, 94 Bristol St, Birmingham. (021) 692 1359. Linn, Naim Audio, Rega, Creek, Denon, Nakamichi, Quad, Mission, Monitor Audio, Rotel. **BADA MEMBER** 

FRANK HARVEY HI-FI EXCELLENCE, 163 Medieval Spon St, Coventry. (0203) 525200. Linn, Musical Fidelity, Quad, Mission, Cyrus, Denon, A&R Cambridge, Rotel, NAD, Nakamichi etc. Three floors of carefully selected hi-fi amidst the eloquence of our 14th century showroom. Dem, home trial and credit facilities. Access, Visa, Diners, Am. Exp. Mon-Sat 9.30-5.30. Closed Thurs. **BADA MEMBER** 

GRIFFIN AUDIO LTD, 94 Bristol Street, Birmingham. (021) 692 1359/(021) 622 2230. Castle, Creek, Cyrus, Denon, Linn, Marantz, Naim, Quad, Rega, Rotel. Tues-Sat 10-6. **BADA MEMBER** 

HORTON ELECTRONICS (1987) LTD, 8-9 Lower Temple St, Birmingham B2 4JD. (021) 643 0972. Aiwa, Dual, Marantz, Goodmans, JVC, Mission, Sony, Technics, Wharfedale, Sennheisser. Dem facilities. Credit to £1000. Access, Visa. 9-5.30 Mon-Sat. Service dept.

MIDLAND RADIO SUPPLIES, Maypole Lane, Birmingham B14 4PG. (021) 430 7817. By appointment only - listen quietly and hear everything through Croft valve amplifiers and Tannoy speaker systems.


RICHER SOUNDS, 12 Smallbrook Queensway, Birmingham B5 4EN. (021) 643 6664. Popular esoteric hi-fi for upgrades, monthly special offers. Dem facilities, expert advice, free local delivery/installation (£500+), 2 Yr G'tee. Hi-fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard. Service Dept.


RICHER SOUNDS, 10 Smallbrook Queensway, Birmingham B5 4EN. (021) 643 1516. An A-Z of affordable, popular hi-fi; no-frills environment. Facilities: expert advice; free monthly Newsletters; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard. Service Dept.

FIVEWAYS HI-FIDELITY LTD, 12 Islington Row, Edgbaston, Birmingham. (021) 4550667. Alphason, A&R, Denon, Meridian, Musical Fidelity, Nakamichi, Quad, Revov, TDL, Thorens, etc. Dem and home trial facilities. Tues-Sat 9.30-6. Free installation. Access, Visa. Service Dept.

BRIDGE HI-FI, 3 Tudor House, Bridge St, Walsall. (0922) 640456. NAD, Dual, Yamaha, Kenwood, Technics, Pioneer, Mission, Celestion, Denon, Mordaunt Short. Appts required. Home trial and free installations. Access, Visa, Diners, Amex. Credit to £1,000. 9.15-5.30 Mon-Sat. Service dept.

OXFORDSHIRE

ABSOLUTE SOUND AND VIDEO, 19 Old High St, Headington, Oxford. (0256) 24311. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. **BADA MEMBER** 
ASTLEY AUDIO LTD, 3 Marketplace, Wallingford. (0491) 39305/34349. AR, Dual, Kenwood, Mordaunt-Short, Mission, Monitor Audio, Philips, Technics, Tannoy, Yamaha. Tues-Fri 9-5.30, Sat 9-5. Records, tapes, 1000+ CD's. Service Dept. Access, Visa; Diners.

WESTWOOD AND MASON, 46 George St, Oxford. (0865) 247783. Linn, Naim, Rega, A&R, Heybrook, Dual, Mordaunt-Short, Mission, Tannoy, Quad, etc. **BADA MEMBER** 

WITNEY AUDIO & VIDEO, 28 High St, Witney, Oxford. (0993) 2414. A&R, Aiwa, Akai, Bose, Denon, Dual, Goldstar, JBL, Mordaunt-Short. Dem facilities. Mon-Sat 9-5.30. Free installation, credit to £1,000. Access, Visa. Service dept.

OXFORD AUDIO CONSULTANTS LTD, Cantay Hse, Park End Place, Oxford OX1 1JE. (0865) 790879. Oxford Acoustics, Audio Research, Krell, Magneplanar, Apogee, Aragon, Stax, Marantz, Wharfedale, Cambridge Audio.

THE CHOICE DEALER DIRECTORY

Home trial and free installation. Instant Credit. Access, Amex, Visa. 10-6 Tues-Sat. Service dept.
HORNS OF OXFORD LTD, 6 South Parade, Summertown, Oxford. (0865) 511241. Alphason, Ariston, B&W, Celestion, Marantz, Nakamichi, Pink Triangle, Quad, Sony, Technics. Free installation. Service dept. Access, Visa. 9-5.30. Closed Thurs. BADA MEMBER **3DA**

SHROPSHIRE

AVON HI-FI Ltd, 12 Barker St, Shrewsbury. (0743) 55166. A&R, B&W, JBL, Dual, NAD, Nakamichi, Revolver, Trio, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9-5.30, closed Thur. Free installation, credit to £1,000. Access, Visa. Service dept.

MID SHROPSHIRE AUDIO, 2 Holland Court, High Street, Dawley, Telford, Shropshire. (0952) 630172. Cambridge Audio, Marantz, Onkyo, Rubric, Tannoy, Alexander, Appolo, Ion Systems, Audio Innovations, SD Acoustics. 2 dem lounge. Home trial. Free Installation. Service dept. Access, Visa. Credit facilities available. Instant credit subject to status. Mon-Sat 10-5 evenings/Sunday by special arrangement.

CREATIVE AUDIO, 9 Dogpole, Shrewsbury. (0743) 241924. Marantz, Meridian, Linn, Naim, A&R, Mission, Nakamichi, Revolver, Castle, Audio Technica. Dem room. Home trial and free installation. Credit to £1000. Access, Visa. Tues-Sat 9.30-5.30. Service dept.

SOMERSET

WATTS RADIO - THE ENGINEERS, Jim Badman, 1 West Street, Somerton. (0458) 72440. Castle, Dual, Denon, KEF, Mordaunt-Short, Ortofon, Quad, Rogers, Thorens, Yamaha. Dem and home trial facilities. Mon-Sat 9-1, 2-5.30, Wed 9-1. Free installation. Credit to £1,000. Access, Visa. Service dept.

STAFFORDSHIRE

GRANGE HI-FI LTD, 153 Branston Road, Burton-on-Trent DE14 3DQ. (0283) 33655. Audio Innovations, Arcam, Creek, Systemdek, Snell, Spendor, Cambridge, Pink Triangle, Quad, Voyd, etc. 2 dem rooms. Mon, Tues, Thurs, Fri, Sat. 9-6. Closed Wed. Free installation. Credit facilities. Visa, Access. Service dept.

ACTIVE AUDIO, 29 Market Street, Tamworth, Staffordshire. (0827) 53355. Arcam, Ariston, Celestion, Denon, Heybrook, Kef, Cyrus, Musical Fidelity, Marantz, Revox, Rotel, Rogers, etc. etc. The only BADA Member in Staffordshire. Full demonstration and home trial facilities. Account and credit cards. Ring for opening times and free 'Fact Pack'. BADA MEMBER. **3DA**

MUSICAL APPROACH, 137A Newport Road, Stafford (above Royal London Insurance). (0785) 55154. Linn Products, Arcam, Creek, NVA, Revolver, Audiotec, Onix, Epos, Marantz, Rotel and more. Home trial. Free installation. Service dept. Credit facilities available, Access, Visa. 9.30-5.30 Mon-Sat.

SUFFOLK

EASTERN AUDIO 41 Bramford Rd Ipswich. (0473) 217217. Quad Audio Lab Denon Dual Marantz Mission NAD Nakamichi Technics Arcam. Mon-Sat 9.30-6. BADA MEMBER **3DA**

SURREY

AERCO AUDIO Ltd, 11 The Broadway, Woking, Surrey GU21 5AP. (04862) 4667. Roksan, Exposure, Ion, Systemdek, Royd, Marantz, AR, Rotel, HK, Nakamichi, Oracle, Infinity, etc. BADA MEMBER **3DA**

PJ HI-FI - The Hi-Fi Shop, 3 Bridge Street, Guildford, Surrey GU1 4RY. Tel: (0483) 504801. 9-6 Mon-Sat. Linn, Creek, Arcam, Quad, Revox, Musical Fidelity, Rotel, NAD, Nakamichi, Marantz. BADA MEMBER **3DA**

ROGERS HI-FI, 13 Bridge Street, Guildford (0483) 61049. Ariston, Acoustic Research, Akai, Denon, JPW, Mordaunt-Short, Marantz, Onkyo, QED, Tannoy etc. Mon-Sat 9.30-6. Dem. facilities. Instant Credit. Access, Visa. Service dept.

SURBITON PARK RADIO, 48 Surbiton Rd, Kingston-Upon-Thames, Surrey. (01) 546 5549. Quad, Dual, Denon, Kenwood, Nakamichi, Rotel, Pioneer, QED, B&W, Tannoy. Dem and home trial facilities. Access, Visa. 9.30-5.00 Tues-Sat. Service dept.

TRU-FI SOUND AND VISION, 2 Central Parade, Redhill, Surrey. (0737) 767400/766128. Akai, Aiwa, B&W, Nakamichi, JPW, Mission, Mordaunt-Short, Nagaoka, Sony, Technics. Dem. facilities. Mon-Sat 9.30-6. Free installation, credit to £1,200. Access, Visa. Service dept.

UNILET PRODUCTS Ltd, 35 High St, New Malden, Surrey KT3 4BY. (01) 942 9567. Mon-Sat 9-6. Thurs 9-7. Dem facilities. Large stock. Amex, Access, Diners, Visa.

SPALDINGS HI-FI, 352-4 Lower Addiscombe Rd, Croydon, Surrey. (01) 654 1231. 3 dem rooms + home dem. Free installation, credit. Mon-Sat 9-6. Tues to 8. Closed Wed. Service dept. BADA MEMBER **3DA**

TRU-FI SOUND & VISION, 10 Church St, Leatherhead, Surrey. (0372) 378780. Sony, Technics, Panasonic, Mitsubishi, Ferguson, Aiwa, Pioneer, Sanyo, B&W, Mission.

Free installation. Credit facilities. Access, Visa. 9.15-5.30 Mon-Sat. Closed Wed. Service dept.

SUSSEX (EAST)

DEFINITIVE AUDIO BRIGHTON, 8 Dyke Road Mews, 74-76 Dyke Road, Brighton BN1 3JD. (0273) 208649. Voyd, Systemdek, Audio Innovations, Helius, Audionote, JPW, Snell, Pirate Stands, Goldring etc. Home dems throughout Sussex. Credit facilities. Visa.

LASER SOUND & VISION, 72 Terminus Road, Eastbourne, East Sussex BN21 3LX. (0323) 640911. Marantz, Cambridge, Kenwood, Denon, Rotel, Infinity, Tannoy, Michell, KEF, Heco etc. Dem room. Home trial. Free installation. Service dept. Visa, Access. 9am-6pm Mon-Sat.

JEFFRIES HI-FI, 69 London Rd, Brighton, East Sussex. (0273) 609 431. 2 dem rooms, closed Mon, late night Wed. Parking, bus route. Credit facilities. BADA MEMBER **3DA**

JEFFRIES HI-FI, 4 Albert Parade, Green St, Eastbourne, East Sussex. (0323) 31336. 2 dem rooms, closed Mon. Late night Wed. Parking, bus route. Credit facilities. BADA MEMBER **3DA**

HASTINGS HI-FI, 31-32 Western Rd, St Leonards On Sea. (0424) 442975. A&R, B&W, Mission/Cyrus, NAD, Nakamichi, Quad, Rotel, Systemdek, Tannoy, Yamaha. 2 dem rooms. Mon-Sat 9-6. Home trial facilities. Free installation. Credit facilities. Access, Amex, Visa. Service dept.

SUSSEX (WEST)

BOWERS AND WILKINS Ltd, 1 Becket Buildings, Littlehampton Rd, Worthing. (0903) 64141. B&W, Cambridge, Dual, JVC, Mordaunt-Short, Nakamichi, Philips, Shure, Quad, Sony. 2 dem rooms. Mon-Sat 9-5.30, Weds 9-1. Home trial facilities, free installation, credit to £1,000. Access, Visa. Service dept.

CHICHESTER HI FI, 7 St Pancras, Chichester, W. Sussex PO19 1SJ. Tel: (0243) 776402. Linn, Naim, Rega, Creek, Nakamichi, A&R, Denon, Roksan etc. Tues-Sat, 10-1, 2-5.15 (closed Mon). BADA MEMBER **3DA**

TYNE & WEAR

RED RADIO SHOP AND HI-FI CENTRE, 11 Olive St, (Off Park Lane) Sunderland. (Sunderland) 5672087. Bose, Castle, Denon, JVC (Hi-Fi and Portable TV), Luxman, Michell, Mordaunt-Short, Pickering, Tannoy. Dem facilities. Mon-Sat 9-5.30. Free installation, interest free credit. Visa. Service dept.

WARWICKSHIRE

AUTHENTIC AUDIO, 25 Henley Street, Stratford-upon-Avon, Warwickshire CV37 6QW. (0789) 414533. Linn, Quad, M.F., Denon, NAD, etc. Dem room. Home trials. Part-ex. Service dept. Mon-Sat 9.30-5.30.

WILTSHIRE

ABSOLUTE SOUND AND VIDEO, 60 Fleet Street, Swindon. (0793) 538222. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER **3DA**

YORKSHIRE (NORTH)

ELITE HI-FI, 178 Kings Road, Harrogate HG1 5JG (0423) 521 831. Voyd, Valdi, Avalon, Systemdek, Helius, Audionote, Goldring, Audio Innovations, Sugden, Marantz. Mon-Sat 9-5.30. Free installation. Service dept. SCARBOROUGH HI-FI CENTRE, 53 Dean Road, Scarborough YO12 7SN. (0723) 374547. A&R, Bose, QED, Denon, Nad (incl. Monitor series), Thorens, Onkyo, Tannoy, Marantz, Ruark. Dem Room. Appts preferred. Home trial facilities. Mail order and part exchange. Visa, Access, Diners, Hi-Fi Markets Chargecard facilities. Open 10-6 Mon-Sat.

RICHER SOUNDS, 66 Walmgate, York YO1 2TL. (0904) 645535. Probably the smallest hi-fi store in York; but stocks the A-Z of popular budget hi-fi at special discount prices. Facilities: expert advice; free monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 9-5. Access, Visa, Richer ChargeCard and cheques up to £1,000 (subject to simple clearance).

YORKSHIRE (WEST)

AUDIO PROJECTS, 45 Headingley Lane, Leeds. (0532) 304565. A&R, Audiolab, Creek, Heybrook, Linn, Musical Fidelity, Naim, Quad, Rega, etc. Tues-Fri 9.30-6, Sat 2-5.30. BADA MEMBER **3DA**

ERRICKS, Hi-Fi Experience, Fotosonic House, Rawson Square, Bradford (0274) 309266. Dem facilities. Sales/service agents for A&R, Linn, Quad, Naim, Nakamichi, Mission etc. BADA MEMBER **3DA**

HUDDERSFIELD HI-FI CENTRE, 4 Cross Church St, Huddersfield. (0484) 544668. B&W, Kenwood, Denon, Dual, A&R Cambridge, Musical Fidelity, Quad, NVA, Audio Lab, Philips, Mission, etc. Dem facilities - appointment reqd. Mon-Sat 9-5.30, Thurs 9-8. Closed Wed. Free installation, credit facilities. Access, Visa.

IMAGE HI-FI Ltd, 8-10 St Annes Rd, Headingley, Leeds.

(0532) 789374. AR, Audio Lab, Denon, Linn, Marantz, Meridian, Mission, Monitor Audio, NAD, Quad. BADA MEMBER **3DA**

RICHER SOUNDS, 55 The Headrow, Leeds LS1 6LR. (0532) 457177. Affordable special deals on every big budget line from Akai to Yamaha; separates & systems. City centre store opposite Lewis's. Facilities: expert advice; free monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 9-5. Access, Visa, Richer ChargeCard and cheques up to £1,000 (subject to simple clearance).

SELECTIVE AUDIO, The Forge Cottage, 19 Crossgate, Otley. (0943) 467689. Exclusively handles Alphason, Roksan, NVA, ProAc, TDL, JDI, in the area and other minimalist British designer products for the discerning listener. Dem facility. Member of the Cognoscenti. Mon-Sat 10-6.

IRELAND

CEOL PRODUCTS, 185 Lower Rathmines Road, Dublin 6. Tel: 0001 975984 961358. Alphason, Audio Innovation, Exposure, Linn, Marantz, Monitor Audio, Mordaunt Short, Musical Fidelity, Rega, Roksan. Single Speaker listening rooms. Free installation. All major cards. Mon-Sat 9.30-6.00.

CLONEY AUDIO, 55 Main St, Blackrock, Dublin. 0001 889449/888477. Arcam, Acoustic Energy, Apogee, Linn, Naim, Creek, Rega, Rogers, Sony, Nakamichi. 2 single speaker dem rooms. Home trial. Free installation. Service dept. All major credit cards. Interest free credit. Tues-Sat 10-6, Thurs and Fri till 9pm.

SCOTLAND EAST KILBRIDE

DAVID STEVEN HI-FI, 1-3 Main Street, East Kilbride, Strathclyde. (03552) 44145. Denon, Infinity, KEF, Marantz, Mission, Quad, Technics, Sony, Yamaha. Dem. room. Home trial facilities. Installation facilities available. Service dept. Access, Visa. Licenced credit broker. 9.30-5.30 Mon-Sat, 5.30-9.30 Mon-Fri by appointment.

EDINBURGH

RICHER SOUNDS, 1B Chambers St, Edinburgh EH1 1HR. (031) 226 3544. Discount hi-fi near the Royal Scottish Museum; affordable culture with monthly special offers on major names. Facilities: expert advice; free monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard and cheques up to £1,000 (subject to simple clearance). BILL HUTCHINSON Ltd, 43 Clarke St, Edinburgh. (031) 667 2877. AR, Aiwa, Denon, Dual, JVC, Mission, Mordaunt-Short, Omar, Technics, Yamaha. Dem facilities. Mon-Sat 10-6. Free installation. Instant credit. Credit cards: Access, Visa. Service dept.

GLASGOW

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 MEMBER **3DA**
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.

GRAMPIAN

HOLBURN HI FI Ltd, 441 Holburn St, Aberdeen (0224) 585713. Linn, Rega, Quad, Audiolab, Mission Cyrus, Rotel, QED, NAD, Krell, Nakamichi, Denon, Sony, KEF, Wharfedale, Monitor Audio, Kenwood, etc. 9.30-5.30 Mon-Sat. BADA MEMBER **3DA**

WALES GLAMORGAN

AUDIO EXCELLENCE, 134 Crwys Road, Cardiff. (0222) 28565. Audio Research, Dual, Krell, Linn, Magneplanar, Naim, NAD, Yamaha, etc. Closed Mon.

BADA MEMBER
AUDIO EXCELLENCE, 9 High St, Swansea. (0792) 474608. Audio Research, Dual, Krell, Linn, Magneplanar, Naim, NAD, Yamaha, etc. Closed Mon. BADA MEMBER
RICHER SOUNDS, 5 Central Square, Cardiff CF1 1EP. (0222) 383311. From Akai to Yamaha on a budget - regular end of line special offers. Facilities: expert advice; free monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard and cheques up to £1,000 (subject to simple clearance).

NORTH WALES

ELECTRO TRADER, 19 Colwyn Crescent, Rhos On Sea, Colwyn Bay, Clwyd. (0492) 48932. Ariston, Arcam, B&W, Heco, Infinity, Onkyo, Rotel, Tannoy, TDL, Yamaha etc. Dem room. Appts preferred. Home trial. Free installation. Access, Visa, American Express, Diners. 9.30-1.00, 2.00-5.30 Mon-Sat.

FOR ALL YOUR **ROKSAN**
REQUIREMENTS AND
AN UNBIASED VIEW ..



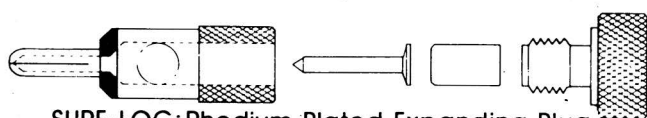
Prices to suit all pockets

THE LEICESTER HI-FI CO
OF ST MARTINS

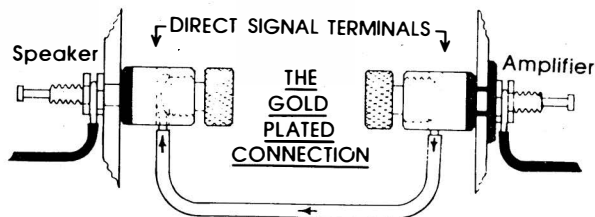
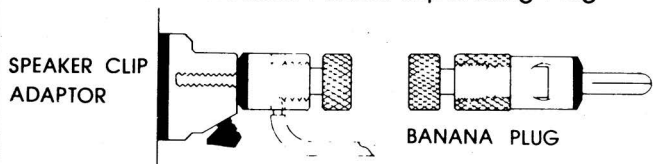
6 Silver Walk, St Martin's Square, Leicester LE1 5EW
Telephone: (0533) 539753

THE MICHELL CONNECTION

"The ultimate connectors for all quality speaker cables"



SURE-LOC: Rhodium Plated Expanding Plug



AN ORIGINAL MICHELL PRODUCT

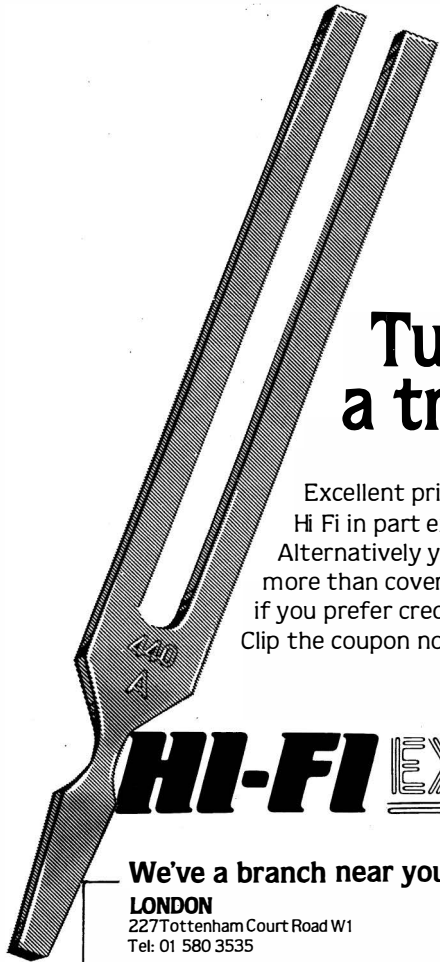
Made in England

WARNING: Beware of inferior copies!

Details from:

J. A. Michell Engineering Ltd.

2 Theobald Street, Borehamwood, Hertfordshire, England
Telephone 01-953 0771



Musical evenings at
Leamington store 6pm-9pm
Thurs 15 Feb Cambridge Audio
Thurs 15 Mar Rotel
Fri 20 Apr Yamaha

Tune up for a trade up

Excellent prices offered for good quality
Hi Fi in part exchange against a new system.
Alternatively your present equipment may
more than cover the deposit on a new system
if you prefer credit.
Clip the coupon now for a free no-obligation quote.

HI-FI EXPERIENCE
You'll like the sound of us

We've a branch near you

LONDON
227 Tottenham Court Road W1
Tel: 01 580 3535

Camden — 2/4 Camden High Street NW1
Tel: 01 388 1300 (nr Mornington Crescent tube)

MIDLANDS
Birmingham — Superfi, 67 Smallbrook,
Queensway
Tel: 021 631 2675
Leamington Spa — 44 Park Street
Tel: 0926 881500

NORTH
Bradford — Erricks, Rawson Sq
(nr John St Market)
Tel: 0274 309266

SCOTLAND
Glasgow — 145 Bath Street
Tel: 041 226 4268



I am interested in trading in the following
equipment.

Date of purchase _____

Against the following new system:

Name _____

Address _____

Tel. No. _____

Post to your nearest Hi Fi Experience branch,
or send to:
Customer Services, Hi Fi Experience,
227 Tottenham Court Road,
London W1.

HFC/0390



SEVENOAKS HI-FI & VIDEO

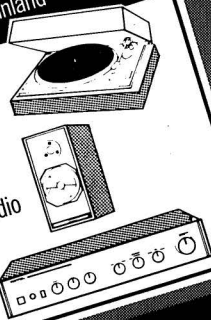
This advertisement is valid until at least 28th February 1990.

SAVE £100

SYSTEM OF THE MONTH £299.95

Including cartridge and all leads. Free carriage UK mainland

- Dual CS503/1 or (Ariston Q deck add £30) or (Dual CS505/3 add £25)
- Rotel RA810A or (NAD 3020E) or (NAD 3130 add £10)
- Celestion DL4 II or (Superb New Monitor Audio 'Monitor 7' add £20)



SUGGESTED SYSTEMS

The suggested systems priced below all include the popular Dual CS503/1 turntable, but an alternative turntable or CD player is available at extra cost. Please see "OPTIONS" list below for further details.

SPEAKERS ▾ All system prices include the Dual CS503/1	AMPS ▾	W/dale Diamond III Celestion 3 JPW Sonata Goodmans Sterling Pt 3 Royd A7 M/Short MS 3.10	Celestion DL4 II H/brook Pt 5 Tannoy E11 A/Research 112 JPW Sonata+ Mission 761	A/Research 122 Celestion DL6 II Monitor Audio R7	Tannoy M15 Castle Warwick Wharfedale 505.2 Monitor Audio R9 M/Short MS 3.30	Heybrook HB1 Castle Durham Celestion DL8 II A/Research 132 Rogers LS4A Add £30 Mission 762	M/Audio R300MD Tannoy M20 (BK) Heybrook HB100 Tannoy DC 2000 (Add £50) M/Audio R352MD (Add £50)
Rotel RA820AX	294.95	309.95	329.95	349.95	369.95	389.95	429.95
Rotel RA820BX4	329.95	339.95	359.95	379.95	399.95	429.95	469.95
Nad 3020E	269.95	279.95	299.95	319.95	329.95	354.95	399.95
Nad 3130	289.95	299.95	309.95	409.95	419.95	429.95	499.95
Rotel RA8A0BX4	379.95	389.95	409.95	499.95	509.95	539.95	619.95
Harman HK6100	299.95	309.95	329.95	349.95	359.95	389.95	439.95
Rotel RA810A	264.95	284.95	299.95	349.95	359.95	399.95	499.95
QED A240CD II	319.95	334.95	349.95	379.95	399.95	414.95	469.95
Yamaha AX330	274.95	349.95	369.95	469.95	479.95	499.95	549.95
Arcam Alpha II	329.95	449.95	469.95	389.95	399.95	409.95	429.95
Rotel RA870BX	429.95	359.95	314.95	314.95	329.95	334.95	374.95
Kenwood KA5010	349.95	299.95	309.95	309.95	324.95	339.95	364.95
Nad 3225PE	289.95	289.95	314.95	314.95	319.95	329.95	364.95
Nad 3020 i	279.95	289.95	309.95	309.95	319.95	329.95	364.95
Kenwood KA550D	279.95	284.95	309.95	309.95	319.95	329.95	364.95
Technics SU 800K	354.95	364.95	379.95	379.95	389.95	399.95	419.95
Musical Fidelity B1							474.95

FREE

Cartridge supplied with these systems
Leads provided with these systems
Carriage for mail order customers on all systems in excess of £250 (UK mainland only).

LISTEN TO THE SUPERB MISSION ELECTRONIC RANGE AT SEVENOAKS HI-FI
PRICES FROM £129.95

- MISSION 761 £129.95
- MISSION 762 £199.95
- MISSION 763 £299.95
- MISSION 764 £459.95
- MISSION 765 £599.95

OPTIONS

The following Compact Disc Player or Turntable may be ordered instead of the Dual CS503/1 in the above systems.

CDs

- Denon DC0520 add £50
- Denon DC0520 add £80
- Denon DC0820 add £130
- Denon DC0920 add £180
- Marantz CD40 add £80
- Marantz CD50 add £150
- Marantz CD50SE add £210
- Marantz CD60 add £190
- Marantz CD60SE add £260
- Nad 5320 add £70
- Nad 5325 add £100

- Philips CD210 add £50
- Philips CD630 add £80
- Philips CD840 add £130
- Philips CD610 add £50
- Philips CD620 add £80
- Philips CDX30 add £80
- Yamaha CDX710 add £110
- Yamaha CDX810 add £170
- Rotel RCD855 add £30
- Sony CDP770 add £70
- Technics SLP202 add £40
- Technics SLP222 add £80
- Technics SLP333 add £120
- Technics SLP555 add £170

TURNTABLES

- Dual CS505-3 add £25
- Dual CS430 deduct £20
- AR EB 101 add £100
- Nad 5120 deduct £20
- Revolver black inc. arm add £40
- Revolver Rebel add £150
- Systemdek + moth add £125
- Systemdek inc. arm add £30
- Ariston "Q" Deck add £70
- Ariston ICON add £80
- Thorens TD280 II add £70
- Thorens TD166 V add £60

SELECTED SEVENOAKS SUPERBUYS AVAILABLE FROM THESE BRANCHES OF AUDITIONS AND WIRES

THE DIRECTORY

The *Hi-Fi Choice Directory* was conceived as a reference guide to all the audio products reviewed by *Choice* that are currently available. The products are split into suitable categories, each with its own introduction containing information about the product type and its applications. They are particularly relevant to the uninitiated first time buyer and help sort out the order of priorities when buying a piece of equipment.

Each product along with its retail price is placed in its respective category in alphabetical order. For instance the Acoustic Research *EB101* is presently at the beginning of the Turntables and Tonearms section; however, the Ariston *RD90 Superior* heads the Motor Units section as it is sold and was reviewed as a separate component – requiring a separate arm. Where there are several products with the same name but different model numbers these are in price ascending order.

Then come the ratings for the standard achieved in laboratory and listening tests, with the exception of certain product groups where lab tests were not carried out. One important point to remember is that they cannot be used to compare products from different categories – ie a cassette deck rated 'excellent' in sound quality will not usually offer the same standard of fidelity as a similarly rated

turntable or CD player (unless you can get hold of first generation copies of the master tape!).

The Comments column contains a potted summary based on the original review, emphasising the salient points of a product's character and sonic performance. The space available doesn't allow for great detail but in the 20 or so words we have attempted to put across the essence of the review, in some cases using quotes from the review itself. Obviously, important information on compatibility or auxiliary equipment used in the test cannot be included, and it is best to refer to the original review for this, of which more later.

The next column(s) varies from category to category but is usually either features or specifications, the former being facilities available on a cassette deck or amplifier or the type of drive system on a turntable.

Specifications vary with product type but usually relate to suitability or capability, for instance arm matching figures are given with the cartridges which tie in with the mass figures for the tonearms themselves, making it easier to avoid compliance/mass mismatches.

Perhaps the most influential letters in the Directory are those found in the Value column, the *Rs* and *Bs* denoting the Recommended and Best Buy ratings that are appended to products we consider meritorious. The Best Buy tag means that a product not only offers good sound quality but is reasonably priced as well. With source components a price limit of approximately £300 is usually used as a

guide. Recommended means that either the performance of a product is particularly good irrespective of price or, alternatively that a good value standard is achieved but overall attainment falls short of Best Buy classification. An ideal situation would be to choose suitably priced Best Buy or Recommended products from relevant categories and create a Best Buy system, but, due to the variety in tonal balance that exists in much audio equipment (especially the electromechanical elements – ie cartridge and speaker) system building is not quite that simple. These ratings make a useful guideline for shortlisting components, but only experiencing the actual combination will tell you whether it works for you.

The final column contains a reference to the issue of *Hi-Fi Choice* which featured the complete review. If you wish to get a better idea of a product by reading the complete review it is possible to order a copy (if still in print) through our back issues department. Every *Choice* issue contains a Back Issues page for this purpose.

The Directory is constantly updated with the latest reviews and price changes as well as having discontinued products removed. If a listed product is updated to a 'mark two' form and the alterations are purely cosmetic or not too extensive we sometimes leave the product in with its current model number and an asterisk to denote that it has changed since our original review was published.

SYSTEM BUILDING

Pre-packaged one-make systems have been commercially very successful, with advantages like cosmetic consistency, competitive pricing, and (assumed) technical compatibility. However, despite the mass market clout of the consumer electronics giants, the hi-fi tradition of specialised separate components seems as strong as ever, and certainly represents the route taken by those who place sound quality ahead of other criteria.

Yet those who choose the separates route still have lingering doubts – usually completely unjustified – over the compatibility of components from different manufacturers. Gross incompatibilities are very rare nowadays, most exotic likely to rear their heads amongst the most exotic components. Here the delicate art of 'supercompatibility' really takes over the major role and might be regarded as the key to 'real' hi-fi.

There are now three different pre-recorded music media competing for the attention of the hi-fi user, and to go for all three will either cost a lot of money or involve substantial compromises in the sound quality of each. For this reason many separates purchasers may start with just one source, adding others or a tuner when funds permit.

There will always be controversy over the relative qualities of LP, CD and cassette. LP is still the choice for ultimate sound quality – particularly for those prepared to spend a substantial sum on a good quality turntable system. Furthermore the vinyl repertoire is still the cheapest, largest and most varied.

Cassette has never really challenged vinyl's superior quality, but it is a multiple role format, offering 'go anywhere' flexibility, a uniquely useful recording capability, plus a broad catalogue of pre-recorded music cassette material. As a hi-fi medium cassette suffers from pre-recorded material which has been improving but is still patchy in quality, and can usually be bettered by a home recording. There is also the worry that a tape made on a specific machine usually replays best on that machine, which may cause aggravation when upgrading a few years hence. It is worth remembering that though such opportunities are rarely possible or practical, a live recording onto cassette using good quality microphones can be the hi-fi equal of any other source.

CD is the latest challenger to these two established media, using a digital instead of analogue storage format. The sound quality remains controversial, hailed as near perfect by its fans but derided by vinyl freaks, so it is probably fairest to say that CD is fine for most listeners, but may not suit everyone; certainly the lack of background noise, defects and deterioration over time are major strengths.

While there will always be arguments about the different music storage and transmission formats available to the hi-fi listener, there is also controversy over the relative importance of the different components which make up the system chain – by which is meant the source, the amplification, and the loudspeakers (and for the pedantic the room itself, though there's often little that can be done here).

For many years the 'weakest link' theory proposed that the loudspeakers needed the most attention, that amplifiers merely had to have sufficient power, and that turntables were pretty well perfect. However, this perspective has become steadily discredited by an alternative 'theory of precedence', which stresses that no subsequent component can make up for the inadequacies of its predecessors – all it can do is supply its own additional degradations. In such a context it is not uncommon to find more than half the system budget allocated to the record player, with scrimping and saving made on amplifiers and loudspeakers, even though these are used all the time whatever the source.

Choosing the components of a system is only part of the task of getting the system as a whole working as well as possible. Good turntables and loudspeakers both benefit to a surprising degree from proper support – from stands that enable them to give their best performance, whether floor-standing or wall mounted.

Siting of components within a room can play a significant role, as can the room itself. Some people may prefer an acoustically more 'live' room than others, but most will agree that the larger it is the better, because this tends to provide smoother and better extended bass reproduction. All rooms create reflections and standing waves, and the effects of these are more severe if all opposing walls are parallel, similar distances apart, and with hard reflective surfaces. Provided that the loudspeakers can be placed fairly symmetrically, slight asymmetry elsewhere in the room is usually helpful.

The loudspeakers are most critical of placement, because it is their job to create the stereo image, and it will be impossible to do this if the sound from each is not roughly similar at the listening position. Each loudspeaker should operate in a similar immediate acoustic environment, unencumbered by other furnishings and structure, and a similar distance from listener, nearby walls, and corners. Some loudspeakers are designed to operate close to a rear wall, others a metre or so out into the room, but all loudspeakers benefit from being closely mechanically coupled via proper stands to the floor.

There is some debate about the best form of fixing, however, adjustable spikes through to the

floor proper or seated into the tops of cross-head screws are generally regarded as the best solution in most circumstances. There is no need for paranoia about using spikes through normal pile carpets because the holes will be almost impossible to find when the stands are removed.

Most decent quality turntables are fairly immune to feedback from loudspeakers, so it should not matter too much if these items are sited fairly close to each other. Indeed it is debatable whether any advantages gained from keeping the turntable well away are not lost through the need to use longer connecting cables.

Mixing and matching the components of a record player to get optimum results can be something of a black art, over and beyond the fairly simple business of choosing a cartridge of roughly the right compliance to suit the arm effective mass. Certainly the combining of turntables and tonearms is not a simple matter, and this is where a good specialist dealer will come into his own, both in terms of recommending good combinations from the models he holds in stock, and then in correctly carrying out the sometimes tricky set up procedures which are often required to get the best results.

The key to getting the best results from a separates system lies in finding an experienced and skilled dealer in the first place, one who takes the trouble to find out what you really want and then demonstrate some likely alternatives, without trying to cram his own particular prejudices down your throat. To some extent the customer's task must be to discover for himself whether the dealer in question is competent or not. Membership of trade organisations like BADA can be a worthwhile pointer to a degree of professionalism, but the bottom line is whether the dealer in question can create a good sound in his own shop. If he can't, there is precious little chance of him doing so in your home. The best dealers should lay on demonstrations so you can hear the differences between components for yourself, and hear the sort of improvements which can be had at different price strata. You can then establish the sort of performance you are prepared to accept within whatever budgetary constraints you have set.

The Directory has been compiled so that it can be used by *Choice* readers as a buying guide. A guide in the sense that you should use the information in it to make a shortlist of equipment suited to your needs and budget, and then audition it at a dealers before taking the plunge. Because tastes inevitably differ it would be unwise to buy purely on the basis of our recommendation and dealers are the most experienced people around when it comes to making systems work as a whole.

THE DIRECTORY

TURNTABLES & TONEARMS

The schizophrenic split between consumer electronics and 'real hi-fi' is most obvious amongst turntables. The former are supplied simply as a means of playing vinyl in a system context. Cheaply manufactured in the Far East, these are complete players with a variety of automatic facilities, sometimes tied into system remote control. But engineering compromises severely limit sound quality, cartridge choice may be P-mount restricted, and such machines are rarely stocked by specialist hi-fi dealers these days.

Specialist turntables offer big sound quality

improvements, but lack so-called convenience features (that practised users often find irksome). Such turntables at the cheaper end of the market (sub-£350) tend to be supplied with matching tonearm, and often include a 'starter' cartridge. Still better quality is found at higher prices amongst the separate motor units and tonearms. Careful partnering and set-up is essential for these individual components, but 'naturally sympathetic' combinations do exist, and the good dealer can help.

Listed separately as integrated players and as turntable motor units and tonearms, our **sound**

quality rating is based on results achieved using a high quality system – but in point of fact the turntable is usually the limiting factor soundwise in any system. **Lab performance** summarises the speed stability, vibration generation and environmental isolation of turntables, along with the friction, alignment and adjustment of tonearms. The tonearm's physical characteristics also define a range of mechanically compatible cartridges (see cartridge listings).

INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research EB101 £230	Good Good	This genuine high fidelity product offers an impressive package at a competitive price	Subchassis, manual, 13.5g	BB	48
Alphason Solo/Xenon MCS £420/£300	Average+ Good	The deck is warm and euphonious with high levels of clarity. Wow artefacts occasionally just audible.	3 point suspended motor unit, optional quartz PSU/speed change 13g		67
Alphason Sonata/HR-100S MCS/Atlas £720/£480/£340	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 Q-Deck £165	Good Average+	Well engineered and good sounding low cost package which is both easy to set up and to use	Semi-auto, belt drive, solid	BB*	67
Ariston Icon £215	Good Good	A thoughtful and efficient design that offers good sound, excellent value and semi-automatic operation too! Good vibration isolation eases siting	Belt drive, suspended, semi-automatic, 10g	BB	79
Ariston Forte £350	Average- Average	Heavy on engineering, short of soul? The Forte almost makes it, losing out only because of some residual pitch variations and a lack of bass power. The arm is modestly good	Manual 2-speed belt drive player and detachable arm, 10g		67
Dual CS430 £89	Average Average-	Ragged, sometimes unpleasant cartridge mixes with a modest pleasing player in a very sharply priced package.	Belt drive, with cartridge, auto return, 5g	R	67
Dual CS503-1 £115	Poor Average	Slated as a replacement for the CS505, the 503-1 needs careful system matching to mask rumble and microphony, but is good enough to benefit from a better cartridge	Semi auto, belt drive, low mass arm	R	55
Dual CS505-3 £139	Very Good Good	Continuous steady improvements have kept this model at the forefront of the budget market. Practicality is excellent and the deck has excellent timing bass/mid and stereo imaging	Semi-auto belt drive, 8g	BB	67
Dual CS5000 £209	Average Average+	The rare 78 facility may give grandpa's collection a new lease of life but the player did not merit recommendation on price vs sound	Electronic, belt drive, subchassis, 10g		48
Goldmund ST4 £4,550	Very Good Excellent	The Studio turntable takes on a cheaper tonearm than the T3F, yet provides a similar reference standard objective and subjective performance at £2,000 less, in a neatly integrated though bulky package.	Solid subchassis, direct drive, parallel arm, detachable headshell	R	60
Heybrook TT2 turntable & arm £424/£269	Average Good+	A gradual process of informed evolution and a sensibly designed arm combine to make this a good sounding middle of the road package. Well supported by dealers	Manual subchassis motor with arm, belt drive, 14g	R	67
JVC AL-FQ555 £170	Below Average Poor	Clear midband sound but woolly bass and crude treble. Ease of use however ranks highly, and there's little to go out of adjustment	Auto, direct drive, 5.5g		67
Kenwood DP-990 £400	Average Average	Smart, slick and massive player suitable for low compliance cartridges only. A good but not inspired performer.	Semi-auto 2 speed direct drive, 16g		67
Kuzma Stabi/Stogi £699/£399	Average+ Stabi: Good; Stogi: Excellent	Stabi is powerful, spacious but not sufficiently subtle. Stogi is an excellent all rounder with even spread of abilities.	Manual, belt drive, subchassis. 12.5g	Stogi: R	60
Linn Axis/Akito £399	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 Sondek/Ittok/Troika* £549/£483/£669	Excellent Very Good	Superb sound – the best LP12 combination yet. The Troika gives the system real solidity and strength, stretching the deck and arm qualities to the full. Arm has since been upgraded	Manual subchassis player, belt drive, 14g	R	60
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
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 armtube/weight, 9g	BB	67
Omega Point Silver/Black £895/£295	Good Good+	An avowedly stripped down turntable that lacks even an on/off switch, the Omega Point Silver offers fine midrange clarity and good stereo, but some HF compression and a lack of 'wellie'	Manual, solid, belt drive, unipivot, 11g		55
Opus 3 Continuo/Decca London International (Revised)* £599/£99	Poor Good	Heavyweight motor unit with many fine properties, but which needs further development. The idiosyncratic arm is a suitable (though not ideal) platform for the Decca cartridge. For all its faults though, the whole transcends the sum of the parts	Belt-drive manual, damped unipivot arm, 12g		67
Rega Planar 2 £155	Average+ Good	A remarkable product at the price, surprisingly articulate and confident	Manual, 11.5g	BB	48
Rega Planar 3 £207	Good Good	A long time leader in its price category, the '3' (with its excellent RB300 arm) sounded nicely 'musical' in a balanced and coherent manner	Manual, 11.5g	BB	48
Revolver Rebel £169	Average- Average-	Fat, assured and forward presentation, but ragged and subjective speed stability problems. With a little further development, it will be a winner	Manual, 2-speed belt drive inc cartridge, 13g		67
Revox B291* £892	Average- Average-	Sound quality ranks as below average. Subjective bandwidth is narrow and the music lacks grace and energy. Ease of use however is unrivalled	Automatic, remote controllable, direct drive parallel arm, prefitted cartridge		55
Roksan Xerxes/Artemiz/Shiraz £695, £495, £595	n/a Very Good	Imaginatively designed, sophisticated front-end system, a little drier than some perhaps, with superior stereo, resolution and presence	2-speed manual, MC cartridge, 9g	R	72
Rotel RP-855 £189	Good Good	Great sound for the money – detailed and clear with good bass and no irritating nasties	Belt drive, solid, speed adjust, 9g	BB	79
Systemdek IIX £248	Good Average+	Poised, clean sounding deck, forward and explicit in character. A good value deck under £250, and a relatively cheap and satisfactory suspended model	2 speed belt drive manual turntable and arm, 11g	R	67
Technics SLBD-22 £90	Average- Average-	Not bad for the price and a great improvement on the L20, it performs reasonably when not stretched	Semi automatic, solid plinth, electronic, 6g P-mount	R	48
Technics SL-DD33 £110	Average Average	As with the QD33 though better value	Automatic, direct drive, solid plinth, 7.5g, P-mount	BB	48

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Technics SL-L20 £115	Poor Average—	A rather lightweight parallel tracker achieving a poor overall rating, with little to recommend it unless you dig facilities	Electronic, solid plinth, 5g, P-mount		48
Technics SL-QD33 £140	Average Average	The quartz speed controlled version of the DD is short on sound quality but not features. But it did have fair focus and some depth	Automatic, Quartz, direct drive, solid plinth, 7.5g, P-mount	R	48
Thorens TD 280 Mk II £180	Good— Good—	Legendary Thorens build quality on the cheap – slightly unsubtle sound but eminently liveable-with and very good value	Belt drive, solid, electronic PSU, 12g	BB	79
Thorens TD 166 Mk V £200	Good Good—	Classic suspended-subchassis deck with clear, stable sound of no particular character. Unlikely to make enemies	Belt drive, suspended, 12g	BB	79
Thorens TD 316 Mk II £220	Good Good—	Very solid deck with neat split-chassis construction. Sound is a bit insecure in the bass, but it could suit classical music lovers well	Belt drive, suspended, electronic PSU, 12g	R	79
Thorens TD320 Mk II £350	Good Good	Good, consistent sounding deck with much improved (but not ideal) arm. A little expensive for performance offered	Semi-auto two speed belt drive, 14g		67
Townshend Rock Reference/ Excalibur £1,800/£650	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
Well Tempered Turntable & Arm £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

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ariston Superior £598	Good+ Good	Good but slightly damped sound quality, with powerful and stable bass. The pro quo is a certain lack of pace, energy and resolution	Belt drive, subchassis, electronic		55
CEC ST930 £599	Good 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 £80	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 Synpro £265	Good Good	A particularly happy blend of qualities endows the Synpro with a blend of subtlety and force – the mailed fist in the velvet glove. Easy on the ear in the best sense.	Manual, belt drive, suspended motor unit	R	67
Michell Gyrodec £595	Good Good	Sweet and natural sounding player, well exploited by the Rega RB300 arm. Aesthetics, and the acres of acrylic, are unique	Manual, belt drive, suspended motor unit		55
NVA Senior £450	Good— Average	Very high sensitivity to low-frequency vibration, especially on NVA stand, gives strange subjective bass response and confused sound. Looks are unusual but pleasing	Belt drive, electronic PSU, two-part plinth		79
Oracle Alexandria Mk III £995 – £1095	Very Good Very Good	One of the most beautifully presented players made, and fully supported by superb separation, dynamics and a euphonious style of delivery.	Manual 2-speed belt drive	R	67
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, 33 $\frac{1}{3}$ rpm only, solid plinth/subchassis		79
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, 33 $\frac{1}{3}$ rpm only, suspended subchassis		79
Oxford Acoustics Crystal Reference £2395	Very Good Excellent	This big, open and powerful sounding turntable works beautifully with Airtangent arm to give superb 3-D imagery	Manual, belt drive, subchassis, stand	R*	60
Pink Triangle Little Pink Thing £345	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
Pink Triangle PT TOO £650	Very Good Excellent	Uniquely clear sound, uncoloured, free from ringing and with good bass. Very close to master tape, given a good arm and cartridge	Belt drive, external PSU, suspended subchassis	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
Roksan Xerxes £695	Excellent Very Good	This unique design cuts a swathe through the conventions of turntable design, providing superb resolution and stereo. Power supply has since been upgraded – see issue 78 for our latest report	Manual, belt drive, solid/decoupled	R	67
Systemdek IIXE £248	Good Very Good	Fine, honestly specified and well built player which easily betters its closest stablemate, the IIX. Frankly, at the price it's a sonic bargain	Manual 2-speed, external PSU	R	67
Systemdek IV £495	Good Very Good	The level of wow is a theoretical concern at least, but elsewhere this player shines, combining euphony, information and imaging in a polished, untemperamental package	Two-speed manual belt drive	R	67
VPI HW-19 £1,317	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
Voyd Valdi £680	Good— Good+	Slight 'one-note bass' effect and lack of pitch stability compromise the performance of this well-made deck	Belt drive, suspended subchassis, electronic PSU		79
Voyd "The Voyd Plus" £2,777	n/a Excellent	Based on the standard 3-motor Voyd but with upgrade options (better bearing, platter, etc) which take it half way to a Voyd Reference, so we've dubbed it The Voyd Plus. Superb build and finish; colourful, dramatic performance. A thoroughbred	Belt drive, 3 motors, subchassis, outboard PSU	R	72

TONEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Alphason Opal £130	Good Average	This is a straightforward adequate sounding low cost arm, priced just above where it rightly belongs	10g		55
Alphason Delta £190	Good Average+	A highly competent design from Alphason gives good sound quality but with slight blurring and treble fizz	16g	R	48
Alphason Xenon £240	Good Good+	A trimmed down HR100S, the Xenon has inferior bearings and a simpler finish, but sounds crisp and coherent. Fits any Linn cutout	12.75g	R	55
Alphason HR100S £420	Good+ Very Good	This S-shaped arm sounds smooth, but nevertheless reproduces transients with fine attack	10g	R	48/Coll
Ariston Enigma £99	Average Average+	Good but not the best in its class: mid-band sounds a little uneven; treble a trifle "brash"	11.5g		48
Audio Technica AT1130 £186	Good Good	Well suited to most cartridges including high-compliance ones, the AT is smooth and tonally neutral, if slightly lacking in 'balls'	8.5g	R	67

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

TO NEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
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/Summary
Eminent Technology £1000	Good+ Good++	One of the best sounding tonearms around, the linear tracking Eminent delivers impressive stereo imagery, focus and transparent sound	9g (vertical)	R	48/Coll
Goldmund T3F arm £3950	Excellent Excellent	This complex parallel tracker created an "ear-opening" experience when tested with a (since updated) Goldmund Studio turntable	16.5g	R	Coll 2
Grace G707 £299	Good Good+	This venerable is still capable, if not competitive with modern alternatives	7g		48
Helius Orion 2 £490	Very Good Very Good	Excellent engineering with rigid bearings, free from slack. It remains expensive but the level of performance deserves Recommendation	12g	R	48
Kuzma Stogi Reference £699	Very Good Very Good	A large, solid and well-made arm that holds the cartridge firmly, giving exceptionally clear sound with just a hint of brightness	12g	R	79
Linn Ekos £895	Very Good Very Good	Superb, state of the art design which builds significantly on lttok's strengths	9g	R	67
Mission Mechanic £900	Good Good+	Nearly right, but inconsistency with level and vague imagery spoil what is otherwise a firm, powerful advocate for black vinyl	11g		55
Moth Arm £78	Good Good+	The ultimate budget arm? Refined, detailed, sweet and natural - performance improves in line with the rest of the system	12g	BB	60
Rega RB300 £115	Good++ Good++	Despite its modest price this sets exceptional performance standards and could be used on a number of high-quality turntables	10-11g	BB	60
Roksan Artemiz £495	Average Good	Interesting design which works a treat on the Xerxes deck. Fits Rega cut-out. See issue 72 for up to date assessment	8g		67
SME 3009 Series IIIS £165	Good Average+	A simplified less flexible (as regards adjustment) Series III with a similarly 'soft' sonic character	5g		48
SME 3009 Series III £229	Good Average+	Comprehensively adjustable and very well made, suited to MM and high compliance MC cartridges	5g		48
SME 3009R £291	Average+ Average+	A higher mass version of the Series III designed for low compliance MC cartridges	12g		48
SME 309 £495	Very Good Very Good	Beautifully made, finished and presented, this arm is fully and easily adjustable and a highly neutral performer	10g	R	79
SME Series IV £810	Excellent Very Good	Superb engineering and finish with a finely balanced sound giving impressive stereo focus and low coloration	10.5g	R	60
SME Series V £1206	Excellent Very Good	Excellent in terms of design engineering and sound quality, this arm arguably sets a new reference standard regardless of price	10.5g	R	60
Souther Tri-Quartz £895	Average Good	A unique parallel tracking arm that makes up for what it lacks sonically in its unusual appearance	3-4g		48

* rating refers to original tested model

CARTRIDGES

Very much the 'slave' of turntable and tonearm and to some extent undermined by the supply of free 'starter' cartridges on many turntable systems, the cartridge is still worth taking seriously. The quality of both the stylus itself and the cartridge's tracking performance are important in preserving that most important part of the hi-fi system - the record collection - and the cartridge also plays a significant role in determining the overall balance of a system.

Cartridges fall into two groups: high output models, capable of working directly into any amplifier, and more expensive low output models. Stereotypically, low output cartridges use the moving coil principle of operation, have better mechanical integrity and tighter tolerances, and give better performance but at much higher cost. Most under-£150 amplifiers and many valve designs need either an extra head amp or transformer to cope with the low output. **Cartridge/amplifier**

interfacing can be very subtle, but even basic high output moving magnet designs benefit in overall balance from optimised amplifier capacitance loading. Still more important, the mechanical cartridge characteristic of cantilever compliance ('springiness') needs to be considered in the light of the effective mass of the tonearm which will be used (see Turntable & Tonearm entries).

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Arcam C77 £22	Average+ Average+	A sensible moving magnet package with good bounce at a competitive price	6-16g Normal, MM	BB	48
Arcam C77Mg £30	Average- Average	Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8g Normal, MM	BB	67
Arcam E77Mg £50	Average Average	Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8g Normal, MM	R	48
Arcam P77Mg £60	Average+ Average+	Cautiously recommended, the P77Mg was preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9g Normal, MM	R	48
Audionote I02VDH £795	Good Very Good	One of the best, giving 'an extraordinarily relaxing midrange clarity'. But it picked up a bit of surface noise and dust and needs a transformer	8-18g Very low (transformer), MC	R	43
Audioquest MC5 £220	Average Average	Offers high-output benefits but the drooping frequency response and severe VTA error preclude recommendation	10-20g Normal, MC		54
Audio Technica AT95E £17	Average- Average	Clear, dynamic if richly balanced, the magnetic '95E is a definite Best Buy	8-14g Normal, MM	BB	48
Audio Technica AT-420E OCC £30	Average Average	Better suited to pop recordings this MM bears some of the sonic hallmarks of the Linn K5	7-14g (damp) Normal, MM	R	67
Audio Technica AT-430E OCC £42	Average+ Average	A rising high frequency response yields something of a treble sting, not a good all-rounder	3-7g Normal, MM		67
Audio Technica AT-F3/OCC LE £70	Average+ Good	Though the 'limited edition' badge is a trifle tongue-in-cheek the 'F3 still offers excellent value	8-15g Low, MC	BB	67
Audio Technica AT-F5OCC £100	Average+ Good	Decent output, good channel balance and a thoroughly refined sound sets the standard at £100	9-20g Low, MC	BB	54
Audio Technica AT-F5/OCC LE £100	Average Good+	This latest sample demonstrated some technical weaknesses but its spacious, fluid sound quality still represents a benchmark at this price	4-10g Low, MC	BB	67
Audio Technica ATOC7 £250	Good+ Good+	The OC9 is better if you can afford the extra. But OC7 is at least a taste of the high-end at a sensible price	6-13g Low, MC	R	54
Audio Technica ATOC9 £400	Average+ Very Good	Tonal colours are reproduced faithfully and it rarely puts a foot wrong. Slightly less transparent than more costly MCs but it has got real wellie. Good value (really!)	6-14g Low, MC	R	60

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

AT OVER £100 THIS COULD LEAVE YOU FEELING A BIT LIGHTHEADED.



How do we convince you and your wallet to part company with more than a hundred pounds for a set of headphones?

Well, not any old headphones, you understand. These are a bit special (at this price they have to be!)

Do we tell you that the Beyer DT 990 and DT 770 are compatible with compact disc players? Yes, but who doesn't?

Or, do we mention that you can listen to anyone from Mozart to McCartney, while someone else in the room is playing the organ? (an unlikely event, we admit, but you never know what turns people on).

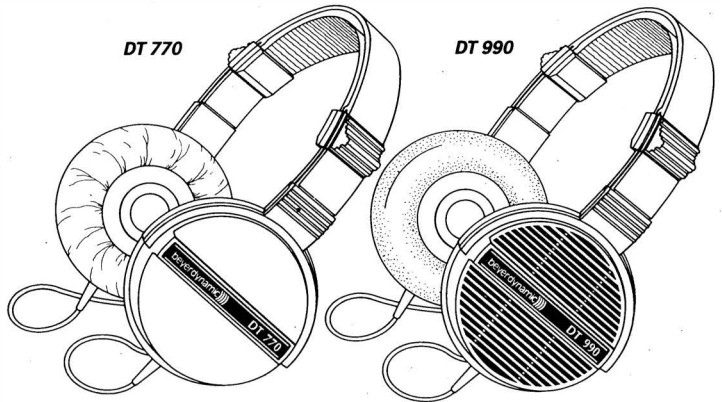
Perhaps we could persuade you that it will go nicely with other status symbols, like your Porsche.

Wait a minute, though, we haven't mentioned the most important thing, yet. The sound.

If we can blind you with science for a moment, here are just a few outstanding features that should help to convince you.

The DT 990 is an open headphone with an unbelievable frequency response of 5-35,000 Hz. The

unique technology used to achieve the very low mass of the diaphragm and moving coil assembly (only 20% of that found on a typical competitor's headphone), results in an exceptionally transient response and a reduction in the non-linear distortion, qualities normally found only in the best electrostatic headphone.



The DT 770 closed headphone combines the latest transducer technology with a unique bass reflex system. This achieves a superb bass response with well defined sound image, plus excellent pulse characteristics.

As you would expect they are both light, very light, and extremely comfortable.

You must hear them to appreciate their real value. You just can't compare them to anything else, simply because there's nothing else quite like them. So get down to your Hi-Fi specialist and listen to the new Beyer DT 990 or DT 770.



Expensive? Yes. Worth it? Yes. Every penny.

Need you hear more.



THE DIRECTORY

CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Audio Technica ART1 £800	Good+ Very Good	This is a delicate and very fluid-sounding MC that tracks well, offers very low distortion and exceptionally good stereo separation	9-18g Low, MC	R	72
Azden YM10VE £12.50	Average Average-	A good tracker. Sounds rather bunched-up but not totally incoherent - for very basic systems only	5-15g Normal, MM		54
Azden GM1E £30	Average- Average-	Of academic interest only, this high o/p MC is seriously flawed in sonic terms	8-18g Low/normal, MC		54
Azden GMP5L £108	Average+ Average+	Although no P-mount system will do this cartridge justice, it can still be enjoyed in its universal mode. The subtle balance may prove irresistible to some	4-10g Low, MC	R	54
B&O MMC5 £24	Average+ Average	Cheapest in the family - smooth treble and good focus, but the bass was left in-the wings	5-15g Normal, MM		38 (Summary)
B&O MMC4 £43	Good Average+	Solid and well balanced in the midrange, the '4 lacks bass impact	5-15g Normal, MM		48
B&O MMC3 £57	Good Average	Slightly "laid back" sound quality but a good performer for the price. Best suited to B&O equipment	5-15g Normal, MM		48
B&O MMC2 £87	Good Average+	Only a modest improvement on its cheaper brothers (and sisters)	5-15g Normal, MM		48
B&O MMC1 £112	Very Good Good	Great clarity and detail at high frequencies but a slightly plodding bass. It may appeal more to the classical enthusiast	5-13g Normal, MM		48
Cello Chorale £590	Average+ Good	Now available through a new distributor at a saving of some £300, the Chorale is still blessed with a delicate but highly detailed treble. Arm matching is a problem	3-9g Low, MC		72
Clear Audio Gamma £295	Average Average+	Brimming over with enthusiasm, the unusual-looking Gamma is more than an audio oddity, but it lacks a little subtlety at times	4-11g Low, MC		54
Clear Audio Delta £450	Average+ Good	Midway between the Gamma and exotic Pradikat, the Delta sounds like neither! Nevertheless, it delivers the goods	6-17g Low, MC	R	54
Clear Audio Signature £995	Average+ Good	This latest MC to emerge from Clearaudio features yet another graded version of its proprietary generator. Its sound strikes a balance between the Delta and Prad	4-11g Low, MC		72
Clear Audio Pradikat £1225	Average+ Very Good	Sounded absolutely glorious, creating a full sense of scale and a large well-focused soundstage - but watch for record wear	8-18g MC		Coll
Clear Audio Accurate £2,000	Good Excellent	A remarkable cartridge, not only by virtue of its effortless and highly neutral sound quality but also because this has been achieved with the same basic design as Clearaudio's cheapest MCs	4-11g Low, MC	R	60
Denon DL110 £69	Good Good	Firmly recommended as a fine all-rounder, this high-output moving coil model is likely to perform well in nearly all circumstances	6-16g Normal, MC	BB	48
Denon DL160 £89	Average+ Good	Although listeners just preferred the 110 its brother here proved a twin in lab tests and is still "thoroughly competent"	6-16g Normal, MC		43
Denon DL 103 £99	Average Good	This classic spherical stylus model gives a lively sound with powerful bass, and is popular in broadcast studios	6-16g Low, MC	R	48
Dynavector DV-50X £60	Good Average	A high-output MC model with impressive lab performance, but whose tip and sound quality both disappointed	6-14g Normal, MC		48
Dynavector DV10X IV £60	Average Average+	Fine sounding and realistically priced, damping is recommended to ensure successful tracking ability	8-18g Normal, MC	R	48
Dynavector DV23RS £150	Average+ Good	Sound quality was described as "shut-in", lacking energy and sparkle but with some "edginess" in high frequencies	10-22g Low, MC		28
Dynavector DV XX-1 £360	Good Good+	The XX-1 embodies a power and solidity rarely encountered amongst the breed, nevertheless it did exhibit a peculiarly suppressed character that will suit lively rather than wholly neutral systems	7-17g Normal, MC		60
Empire 800 Mk II £33	Good Average	This very high output MM appears to be based on the classic Ortofon VMS series. A trifle uninspiring overall	7-17g Normal, MM		67
Empire MC-5M £110	Average+ Good	A very low compliance renders this MC best suited to heavy tonearms while its sweet, non-aggressive sound quality earns it a recommendation	13-20g Low, MC	R	67
Empire Benz Micro MC-2 £600	Average Good+	Similar to both the Empire MC1000 and vdH MC2 in design, the Benz offers a warmer and very transparent account of the music. Its tracking prowess is slightly limited	5-12g Low, MC	R	72
Glanz MFG 110EX £24	Average Average	A little bright but giving detailed bass and clear treble this was competitive at the price	6-11g Normal, MM	R	Systems
Glanz GMC-10EH £49	Good Good	The rising HF trend of this high o/p MC may cause problems in certain systems but with a favourable wind its seductive qualities will win out	8-14g Normal, MC	R	67
Glanz GMC-10LX £79	Average+ Average+	Bearing some of the hallmarks of the '10EH, the '10LX is still less competitive in the sonic stakes	7-15g Low, MC		67
Glanz GMC20E £129	Average Average	You could try haggling but we thought the makers of this number were demanding too much lucre for their product	3-6g Low, MC		48
Goldmund Clearaudio £1500	Average+ 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 Elan £15	Average+ Average	A lightweight and frisky-sounding MM that appears to be based upon the same body as the Nagaoka mm4	7-15g Normal, MM	R	67
Goldring Epic II £23	Average Average+	An excellent budget choice though the limitations of the stylus are rather obvious at higher frequencies	5-12g Normal, MM	R	67
Goldring Eroica L £95	Average Average+	Open and relaxed sounding, the L version is just that bit more refined than its high output brother	7-18g Low, MC	R	54
Goldring Electro II £149 complete	Average Average+	A pretty decent allrounder; a good cartridge, in fact - but a bit pricey	8-16g Normal, MC		43
Goldring Excel £500	Average+ Good	Goldring's most expensive cartridge to date errs on the warm and heavy side of neutral. Strong bass lines are its forte though its ability to resolve subtle treble details is weaker	6-13g Low, MC		72
Grace F9E II £240	Good Good	For lively presentation, excellent separation and generally satisfactory sonic delivery - consider this model	5-10g Normal, MM		48
Grado XTE +1 £22.50	Average- Average	Bass and treble are a trifle coloured but the midband proved highly enjoyable. Ideal for budget systems	6-13g (damping) Normal, MM	R	54
Grado XF3E + £43	Average- Average	Downtilting balance disguises the brightness of this cartridge; bit of a mixed bag at this price	9-20g (damping) Normal, MM		54
Highphonic MCA3 £360	Very Good Good+	Exquisitely crafted by a group of ex-Denon engineers, this superb tracker had a sweet and seductive (if rather bright) treble	5-12g Low, MC		43
Kiseki Blue Silver Spot £395	Average+ Good	Solid performance from a very solid cartridge but lacks some of the magic of other Kisekis. Compliance too high	5-12g Low, MC		54

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Kiseki Purpleheart Sapphire £695	Good+ Good+	Rare, beautiful to look at and sweet to listen to, our review of this high-flyer conjured up images of Japanese art	5-14g Low, MC		Collection
Kiseki Blackheart £1595	Good Good	This cartridge demonstrated refined poise and a delicate but at once potent security, however, the price did seem a little on the high side compared to other Kisekis	6-16g Low, MC		60
Kiseki Lapis Lazuli £3500	Good Very Good	Combining very sensible design concepts at a silly price, the Lapis Lazuli is best thought of as combining the detail of the MC3000 and the fluidity of the Clearaudios	4-12g Low, MC		60
Koetsu Black S £599	Average Good+	The S is an OEM design built to Koetsu's blueprint. It features a sturdier fixing plate and offers a brighter, faster and more tactile sound than the earlier K	8-15g Low, MC	R	72
Koetsu Red £896	Good+ Very Good	Named like a rare, and perhaps dangerous, little oriental fish this famous cartridge sounded "almost larger than life"	10-25g Low, MC	R	48/Coll
Koetsu Red Signature £1391	Good Excellent	Technically this cartridge suffers no faults whilst on a subjective level it offers rare musical insight	10-21g Low, MC	R	60
Krell KC-100 £700	Average Good	Apparently based around a similar generator as the Cello Chorale, the Krell provides a similarly light and airy sound. Low mass arms with damping are best used	3-9g Low, MC		72
Linn K5 £30	Average Average+	Not as crisply focused as the costlier Linn magnetics, the K5 offers a smoother presentation	7-16g Normal, MM	R	67
Linn K9 £75	Average Good	Linn threw this model into the leading pack by beefing up the Basik's bodywork, adding a super stylus, and keeping the price fair	6-15g Normal, MM	BB	48/Coll
Linn Asaka £299	Good+ Good+	Disciples of Linn who are trying to realise their true "Karma" may find that saving money is not a short cut to heaven	9-18g Low, MC	R	48/Coll
Linn Karma £435	Very Good Very Good	A specialist which is strongly recommended for Linn-based systems; results may be less predictable in more general application	9-18g Low, MC	R	48/Coll
Linn Troika £669	N/A Very Good	Ex-Karma users have been seen with glazed expressions indicating smug self-indulgence the morning after fitting a Troika	8-18g Low, MC		Coll
London Maroon £109	Average Average+	Now manufactured under the London brandname this Decca cartridge is as iconoclastic as ever	9-20g (damp) Normal, MM		67
London Super Gold £248	Average- Good+	Sometimes a bit fierce in emphasising record surface faults, it is perhaps best at revealing the excitement and tension in music	8-20g + damping Normal, MM	R	48/Coll
Madrigal Carnegie One £685	Average+ Good	Looks like a duck but sounds much better, certainly worth auditioning. Compliance too high	5-11g Low, MC		54
Milltek Aurora £198	Good+ Good+	An overall feeling of relaxed ease characterised this clear and atmospheric Kiseki-built cartridge	8-16g Normal, MC	R	48/Coll
Milltek Olympia £298	Average+ Good+	Warm and detailed sound - packs the punch of the best MCs with high output as a bonus	12-20g (damping) Normal, MC	R	54
Mission 773HC £150	Good Good	A sufficiently well-balanced and competitively priced "old-timer" which still warrants recommendation	6-16g Low, MC	R	38
Monster Alpha 2 £479	Good Good+	In the final analysis this fine allrounder is insufficiently exceptional in any specific respect to justify fully its high price	6-14g Low, MC		Collection
Nagaoka MM4 £8	Average- Average-	Clear punchy sound that delivers the rudiments of a good performance	6-16g Normal, MM	R	54
Nagaoka MP10 £17	Average Average	High frequencies sounded "shut-in" with this spherical-stylus model, but mid and mass were energetic, bouncy and punchy	5-13g Normal, MM	R	48
Nagaoka MP11 Boron £38	Average Average+	Responding well overall in PM's equipment and listening room, this model was mildly criticised for low level and dynamic limitations	5-13g Normal, MM	BB	48
Nagaoka MP10SB £40	Average Average+	Stilton's mods have improved the fine detail resolution of this popular budget model	5-15g Normal, MM	R	54
Nagaoka MP11 Gold £45	Average- Average+	There were mild criticisms directed at most areas, but in general the sound was clear, open and even	3-8g Normal, MM	R	48
Nagaoka MP11 Gold SB £70	Average- Average	Excessive price loading for a blob of aluminium	2-6g Normal, MM		54
Ortofon OM5E £15	Average- Average-	The OM10 is a hi-fi cartridge - the OM5E is not	5-16g Normal, MM		43
Ortofon VMS5E II £14	Average Average	Sound quality was thought fair for the price, though a little 'untidy'	8-18g Normal, MM		38 (Summary)
Ortofon OM10 £20	Average Average	One of the leading "cheapies", this gives a fine level of sound quality for the price, with good matching compatibility	5-15g Normal, MM	BB	48
Ortofon VMS 10E II £21	Average- Average-	Some of its stablemates fared rather better, and showed less evidence of tracking problems to boot	Normal, MM		38
Ortofon VMS20E II £35	Average Average	One of the most popular cartridges ever, sound quality was a bit laid-back and tracking could have been better	3-10g Normal, MM		48
Ortofon OM20 £40	Average Average+	This turned out to be the listening panel's favourite among Ortofon's moving magnet models	5-16g Normal, MM	R	48
Ortofon 520 £50	Average Average+	Very sensitive to load capacitance this new Ortofon maintains the company tradition for a lively, effervescent SQ	7-16g Normal, MM	R	67
Ortofon X1 £50	Average Average	The cheaper X1 scored higher marks with our listening panel than the X3, but both were a disappointment	6-15g Normal, MC		48
Ortofon VMS30E II £52	Average+ Average	Rather an old soldier in relation to turntable technology, it will perform undemandingly in demanding circumstances	5-13g Normal, MM		38
Ortofon MC10 Super £70	Average Good	"What a delightfully sweet-sounding cartridge this is..." we said	5-15g Low, MC	BB	48
Ortofon X3 £70	Average Average	A lack of bass power, definition and a "zitty" top end makes this competent but uninvolved	5-15g Normal, MC		48
Ortofon OM40 £80	Average Average+	Highly competent engineering, secure tracking and decent sound quality are major strengths. But it's a little cold, a little polite	3-8g Normal, MM		48
Ortofon 540 £100	Average- Average	Graced with an advanced FG11 stylus our sample possessed too high a compliance for broad arm matching. It could also sound a little unforgiving	3-8g Normal, MM		67
Ortofon MC20 Super £170	Average+ Good+	An "inviting" sound quality; polite rather than exciting it approaches much more expensive models, but does not better them	6-15g Low, MC	R	48/Coll
Ortofon MC30 Super £250	Very Good Good+	Beautifully engineered and well-balanced, it was slightly criticised as bland, though some may appreciate the lack of rough edges	5-14g Low, MC		Coll

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Ortofon MC3000 £800	Good Excellent	Quite simply, the most accurate transcription device yet created – not one for the faint hearted	6-16g V. Low, MC	R	60
RATA RP20 £22	Average— Average	Good integration, a clear dynamic midrange and the beginnings of fine stereo imagery merits clear recommendation	6-14g Normal, MM	R	48
RATA RP40 £44	Average Average+	The '40 did a good job of sorting out the layers and complexity of the mix, with good focus, excellent stereo spread and fine scale	6-15g Normal, MM	R	48
RATA RP70 £77*	Average Average+	Clearer and sweeter than the '40 this also seemed heavier and less lively. For £99 you can have a van den Hul stylus	6-14g Normal, MM		43
RATA RP70vdH £99	Average+ Good	Able to retrieve bags of musical detail (thanks to the vdH stylus), RATA's top cartridge ranks as one of the most articulate MM's available	11-18g Normal, MM	R	67
Rega Bias £34	Average Average+	Difficult to mount in some arms due to its shallow build, the bias offers a gentle, refined SQ that certainly makes it worthy of audition	4-10g Normal, MM		67
Rega RB100 £38	Average Average+	Remarkable mechanical performance in the right system context, but "try before you buy"	5-12g Normal, MM	R	48
Rega Elys £74	Good Good	Clearly superior to the Bias, despite their common heritage, the Elys is both more detailed, accurate and musically convincing	8-15g Normal, MM	R	67
Revolver £20	Average+ Average	This modified AT-95E enjoys a very lively mid and treble even if the bass is somewhat 'slower' in protection. A firm budget buy	8-16g Normal, MM	BB	67
Shure M92E £15	Average— Average	Though lacking depth, the overall sound quality was competent, but treble was not its forte	10-15g Normal, MM		43
Shure M99E £26	Average— Average—	Sister to the 92E this is a solid but not particularly exciting cartridge	5-10g Normal, MM		38 (Summary)
Shure ME75ED £24	Average Average—	Rather bright and splashy in the high frequencies but nevertheless a competent model	5-10g Normal, MM		38
Shure M104E £32	Average— Average	Capable in many ways, but giving no substantial improvement over the 92E in our view	5-15g Normal, MM		38
Shure ME97HE £44	Average Average+	It won't turn a sow's ear of a turntable into a silk purse, but will at least keep going and produce an acceptable result	8-20g Normal, MM	R	48
Shure M105E £45	Average Average—	A slightly 'spitty' sound lacking deep bass and dynamic contrast, but can be used in virtually every system where it will perform "unobtrusively"	5-12g Normal, MM		38 (Summary)
Shure M110HE £55	Average Average	Sound quality was thought eminently presentable, but not exciting; smooth clear high frequencies, but a loss of bass definition	5-10g Normal, MM		38 (Summary)
Shure M111HE £67	Average Average	Early reviews of this cartridge complained principally of the price – which has since come down	5-10g Normal, MM		38 (Summary)
Shure ML120HE £95	Average+ Average+	Quite decent sound quality and a generally fine balanced performance	6-18g Normal, MM		48
Shure ML140HE £120	Average+ Good	Qualitatively the treble of this well-balanced moving magnet model was a match for many moving coil cartridges	6-16g Normal, MM		43
Shure V15 VMR £195	Good Average+	Initial listening gave promising results, but extended familiarity gave the feeling of a lack of energy and a "shut-in" sound	5-12g Normal, MM		38
Shure Ultra 500 £452	Good Good	There was no doubting the accomplishments of what could well be the finest moving magnet cartridge around	6-14g Normal, MM		48
Stilton/AT-F3 £110	Good+ Good+	At a premium of some £40 this modified AT-F3 offers a startlingly refined performance and is strongly recommended	8-18g Low, MC	R	67
Supex SM100E £115	Average Average+	Delivers as much musical information as many moving coils – the bass in particular having an attractive bounce	6-15g Normal, MM		38
Supex SD900IV £350	Average+ Good+	The 900 is an inherently fine cartridge, but despite a recent update it is beginning to show its age	10-18g Low, MC		48/Coll
Supex SD901IV £375	Average+ Good+	This high output model delivered sufficient subjective and objective performance, plus good compatibility, to justify its price tag	8-18g Normal, MC	R	48
Supex SDX2000 £651 L £721 H	Good Good+	The high-o/p 2000 was preferred on listening tests to the low-o/p model, which even so has a unique place among the top designs	6-16g, Either, MC		48
van den Hul MC10 £699	Good Good+	A neutral balanced performer giving transparent midrange, fine depth and focus with firm extended bass. Gosh!	5-10g Low, MC	R	60
van den Hul MC One £699	Good Very Good	This extended all the positive qualities of the '10 but added greater authority and scale – worth it for the extra money	6-12g Low, MC	R	60
van den Hul MC Two £899	Good Very Good	Connected directly to any standard MM input the vdH MC Two rewards with a highly detailed yet fluid and musically convincing portrayal	6-13g Normal, MC	R	72

* rating refers to original tested model

AMPLIFIERS

The amplifier sits at the heart of the system, processing the outputs from all the various music sources as necessary and then driving the loudspeakers. These two (quite separate) functions are integrated into a single box at the low-to-middle price points; separated pre- and power amplifiers become increasingly common as one moves upmarket. At the upper end of the specialist market, valve amplifiers provide a popular alternative to the transistor types amongst enthusiasts.


There is a substantial difference between specialist (sound quality oriented) amplifiers and the consumer electronics style models. The former

are bleakly simple, avoiding all unnecessary features to provide the most direct signal path in the interests of best sound quality. The latter range from models with just basic tone controls and tape recorder switching, to those with elaborate facilities such as graphic equalisers, remote control (including volume), surround sound options etc. etc.

Lab measurement provides some useful data, particularly in regard to an amplifier's ability to drive a wide range of different types of loudspeakers, but this is only obliquely related to sound quality. We also include our measured power output (RMS, 8ohm load, 1 channel driven) – but

again, paradoxically, this doesn't necessarily correspond to the loudness capability of the amplifier, which has as much to do with the elegance of the overload characteristics within a given system (valve amplifiers invariably sound more powerful than their rating would suggest). The listing of features provides some indication to the complexity of an amplifier: many users prefer to retain the option of tone controls to 'shape' the overall sound according to taste; many others have found living without tone controls surprisingly easy, with additional benefits in terms of transparency.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research A03 £160	Average+ Average	New slimmed down version of the A04 with less power and facilities but also a slightly 'fuzzy' sound	38W, MM disc, CD direct and 3 aux inputs		74
Acoustic Research A07 £299	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

MARTON 

MUSIC 

For Kelvin Labs amplifiers, Rock Reference turntable, Glastonbury speakers, and more of the best.

Demonstrations by appointment.

5 Ventnor Way

Fareham

Hants

Tel: (0329) 231 773

Warstones
Hi-Fi
Studio
54A Warstones Rd
Penn
Wolverhampton

Tel: 345114

The Hi-Fi Shop

GUILDFORD'S SPECIALISTS SINCE 1950

3 Bridge Street,
Guildford
Surrey

Tel: (0483) 504801

"It's here.....
and lots more too....
including Linn, Quad,
Creek, Revox etc,etc."

We open Mon-Sat 9-6pm (later
by app)

PROGRESSIVE
AUDIO

Come and hear the
Integrated
(recommended in this
issue) and all the other
Kelvin Labs amplifier
combinations.

Phone Dave on 0634
389004

AUDIOSCENE
QUALITY HI-FIDELITY
CHESTERFIELD

For Kelvin
Labs and
other famous
names



Chatsworth Road

Brampton

Chesterfield

Tel 204005



VISA

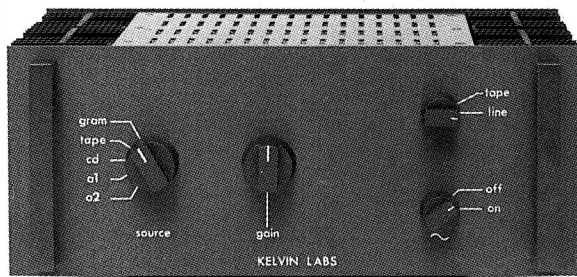


AB AUDIO

Kelvin Labs on dem-
onstration here.

Eastbourne
(0323) 28118

**KELVIN LABS -
THE INTEGRATED
AMPLIFIER
AFFORDABLE
SUPER-FI**



KELVIN LABORATORIES LIMITED
6, Shanklin Crescent,
Upper Shirley, Southampton.
SO1 2RB
Tel: 0703 785123
Fax 0703 704808

The Kelvin Labs
Integrated Amplifier on
demonstration now.



STANDENS FOR SOUND

STANDENS
92a High Street,
Tonbridge, Kent
TN9 1AP
Tel: 0732 353540



Salisbury Hi-Fi
Kelvin Labs on
demonstration
here.

Salisbury HiFi
15, Catherine Street,
Salisbury, SP1 2DF
Tel: 0722 22169



We have the facility to
demonstrate the full range of
Kelvin Labs products.

35-37 Marsham Street
London SW1P 4LA
Tel: 01 233 0774
Fax: 01 233 0773

C A Chantry Audio
Hi-Fi Specialists

Chantry Walk, 18A Eldon Street,
Tuxford, Near Newark, Notts.
(0777) 870372

**Kelvin Labs on
dem. with:-**

Pink Triangle, Royd, JPW, Rotel,
BLQ, NVA, Michell, Art Audio
(valve), and much more.

Hightown Audio
D. P. HI-FIDELITY LTD.

Main stockists for: Aiwa, Audio Innovations,
Cambridge Audio, Celestion, Concordant, Croft,
Cyrus, Dual, Glastonbury, Kelvin Labs,
London Decca, Marantz, Mission, Onkyo, Proton,
Quad, Revolver, Rock Reference, Systemdek etc.

HIGH TOWN AUDIO
106, Victoria Street,
Crewe, Cheshire,
CW1 2JE
Tel: 0270 211 091



Kelvin Labs on
demonstration here.

93, High Street,
Ryde,
Isle of Wight.
Tel: (0983) 63993

THE DIRECTORY

AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
ADC A-2080E £400	Good+ Average+	Clean and neutral sound but one that lacked depth and spaciousness; MM input favoured above MC or CD	108W, logic sw. for 5 line and MM/MC inputs		68
Akai AM-52 £230	Average+ Average-	Basically equipped, this amplifier offers a comfortable but hardly over-detailed sound	95W, MM/MC disc, 5 line inputs, loudness		74
Akai AM-93 £550	Average Average-	Unfortunately Akai's on-board D/A converters were less successful than its conventional analogue CD input.	112W, coax and optical dig inputs. MM/MC		68
Amadeus Gold £360	Average- Good	There is some indication of instability but otherwise sounds very rich, warm and musical. High-ish IMD.	56W, MM/MC plug-in cards, 3 line inputs	R	74
Analogue Electronics PR3/PA4 £280/£280	Poor- Fair	Our samples, though certainly not prototypes, were technically compromised. Preamp sounds very bass light while the power amp sounds very coarse	29W, MM/MC, separate source and record out, recessed 4mm sockets		74
Aragon 4004 £1795	Good Good	Despite its imposing bulk the Aragon is something of a softy at heart. It can deliver oodles of power but its musical presentation is more laid-back	231W power amp		72
Arcam Alpha II £180	Good Good+	Very confident, convincingly musical and punchy sound that sets the standard for other budget amps	41W, 4 line and MM inputs	BB	68
Arcam Delta 60 £280	Good Good+	Very refined and highly detailed sound via MM and CD without any of the harshness noted via the MC stage	59W, 4 line, MM/MC inputs, no tone controls	R	68
Arcam Delta 90.2 £400	Average+ Average+	Dark but slightly dead or conservative sounding version of the original Delta 90. Improved disc stage	73W, MM/MC, 4 line inputs, tone bypass, bi-wire	R	74
Ariston Amp £219	Average Average+	Slightly veiled and thin sound but proved suitably attractive in the listening tests	32W, full logic control, MM and 4 line inputs	R	68
Audio Innovations Series 200 £375	Poor Good++	Like most 'Innovations valve power amps, compatibility with other brands is unpredictable. Hardly a powerhouse, but nicely 'open', transparent and dynamic sound in small(ish) systems	12W	R	77
Audio Innovations Series 300 £425	Poor Good++	Something of an anomaly the 300 is an integrated valve amp that looks awful in the lab but sounds remarkable in a system	10W, MM, 6 inputs	BB	63
Audio Innovations Series 400 £575	Poor Good++	Superior styling and better build quality than the Series 300 make for a very attractive integrated valve amp. Capable of fine results in the right system, but can sound too 'thin' and lacking in welly	12W, MM and 4 line inputs	R	77
Audio Innovations Series 1000/2nd Audio Amplifier £1229/£2250	Poor Excellent	This valve combination offered awesome dynamic range with superb transparency and power to match. Compatibility with other brands is unpredictable	15W, MM, 6 inputs, monobloks	R	63
Audiolab 8000C £325	Excellent Good	A well established preamp with a highly controlled sound, though it could do with more life and depth	MM/MC, 5 inputs, hdph, tone controls	R	62
Audiolab 8000A £350	Very Good Good+	Exceptionally detailed, tactile and transparent via CD but slightly more clouded via disc. A stalwart design	72W, MM/MC, 4 line and full record out selection	R	74
Audiolab 8000P £495	Excellent Good+	A dynamic powerhouse, load tolerant and sonically reliable	100W	R	62
Audion CD-1 £399	Average+ 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
Beard Audio CA35/P35mkII £695/£895	Fair+ Very Good	Good build quality and a very smart finish combine with a characteristic valve sound to make a first class amplifier capable of giving hours of musical enjoyment	35W, MM/MC, 4 inputs	R	63
Beard 506 £1195	Good+ Good+	A versatile valve preamp - the bass sounded lively if a touch softened while the treble was detailed but lacked a little sparkle and air.	4 inputs MM/MC	*	50
Beard M70 £1995 pair	Good Good+	A substantial British monoblok power amplifier, but not a great deal more impressive than the P35 at half the price	70W	*	50
Bryston 0.5B/2B £595/£695	Very Good Good	Very rugged Canadian pre/power combo that sounds cool confident and punchy. Headamp available to suit MC cartridges	65W, MM and 4 line sources, overload LEDs on power amp	R	74
Bryston 12B/4B £995/£1395	Good+ Good	Bryston's massive 4B power amp stood out as the backbone of this combo, the preamp sounding a trifle unbalanced between MM and MC inputs	272W, bridgeable to 800W. 6 line, 2 disc inputs, subsonic filter		68
Cambridge Audio P40 £200	Good Good+	A very fine sounding integrated amplifier with simple facilities and MC cartridge capability	5 inputs 40W MM/MC straight line	BB	50
Cambridge Audio C75 £279	Good+ Good+	Whilst not quite on par with its A75 companion this preamp provided excellent stereo imagery but was a touch "heavy" in character	MM/MC disc	R	50
Cambridge Audio P55 £290	Very Good Very Good	A grown up P40, the P55 suffers slight noise on the moving coil input but offers great sound for the money	55W, MM/MC, 5 inputs, hdph	BB	62
Cambridge Audio A75 £299	Very Good Very Good	This strong power amplifier sounded open and effortless, with fine bass drive and dynamics, albeit a touch grainy and harsh at high frequencies	100W	R	50
Cello Audio Suite £4300	Excellent V Good/Excellent	Cello's preamp represents a whole new ball game in flexibility and sound quality (or war of attrition on your wallet)	Optional inputs MC etc	R	50
Concordant Excelsior £856	Good+ Excellent	Cottage industry styling might not inspire confidence, but sonically this preamp is tremendously vivid and detailed. Real high-end performance. We loved it!	MM plus 3 line inputs. External power supply	R	77
Conrad Johnson PV10 £1,395	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 MV50 £1995	Good+ Good+	Coupled with the PV5, this CJ power amp performed well on audition	50W		Collection
Conrad Johnson Motif MC-8 £1995	Very Good Very Good	A cheaper alternative to the '7, this preamp is an undoubted success in maintaining the Motif sound but does not compare on sound quality	MM/MC	R	50
Conrad-Johnson Premier Seven £8995	n/a Excellent	Price has increased since we tested it - but at this price who cares? The 'Seven is designed without compromise, and it's clearly one of the finest (valve) preamplifiers money can buy. Absolutely gorgeous!	MM, 4 line inputs, sep. Rec Out, versatile cartridge matching	R	72
Counterpoint SA12 £1250	Good+ Good+	A real power-house power amp, beefy and load-tolerant although like the SA7 a trifle untidy at frequency extremes	100W		Collection
Creek CAS 4040 S2 £179	Good Good	More neutral than its predecessor tonally, substantial improvements in transparency were also noted, while the lively punchy, character is retained	30W, MM, 4 inputs, tone controls	BB	62
Creek CAS-5050 £399	Average Good	Strong RF IMD compromises the sound of the CD input which contrasts with the delightful performance via MM/MC.	72W, MM/MC, aux CD and video + pre/power mode	R	74
Croft 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	4 inputs, MM, straight line	R	57
Croft Series IV(S) £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 IVSA £1000	Good Very Good	Featuring tuned components chosen for their sound quality, the 'A' variant is an impressive example of Croft's technique in valve design	60W special supply regulation	R	57

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Deltec DSP-50S DPA-50S Pre/Power £675/£825	Excellent Very Good +	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, R MM/MC no tone controls	R	68
Deltec DPA 100S £2200	Very Good Very Good	A top-quality transistor power amp, sounding fast, articulate and well controlled, though maybe a touch clinical for some tastes	80W	R	50
Denon DAP-2500 POA-4400A Pre/Power £549/£599 pr.	Very Good Good	Denon's fully-fledged preamp also incorporates D/A converters that did not improve the sound of our £299 CD player. The power amps are brilliant!	172W, monoblocks Opt/Coax dig + 2 tape, 4 line and MM/MC inputs	R	68
Denon POA-6600 £1,000/pair	Excellent Very Good	Delivers abundant high quality sound, solid engineering expertise and content clearly compensating for any compromising of purist audiophile principles	250W monoblock, remote power	R	60
DNM 3A From £1000	Good + Very Good	The DNM3 in its acrylic case is a remarkably revealing and neutral state of the art preamp	5 inputs MM/MC twin vol controls	R*	44
E.A.R. 802/509mkII £998/£1698	Average Very Good	Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100W, MM, 6 inputs, monoblocks	R	63
E.A.R. 549 £3,298/pair	Very Good Very Good	A valve monoblock 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 monoblock, bias setting		60
Exposure VII/VIII £430/£470	Very Good Good	Supplied as a combination without the separate preamp power supply, this pre power combination performed satisfactorily especially on the moving coil input	50W, MM/MC, 3 inputs, straight line		62
Exposure VI/VII Dual*/VIII Pre/Power £320/£500	Good Very Good	An established company like Exposure could do more to improve the 'look' of these amps which, nevertheless, sounded confident, and musical. Dual version no longer available	63W, Super mod. 4 line and 2 disc inputs with full rec-out switching	R*	68
Grant 660AMS £948	Good Very Good	This neat and compact 60W valve monoblok gave good sound on the 8ohm tap, better still on 4ohms. The midrange was particularly natural	60W monoblocks 8ohms	R	57
Hafler DH120 kit form £295	n/a Fair	We didn't build one; see below	60W		44
Hafler DH-110/XL-600 £360/£1,145	Very Good Very Good	Preamp is available in kit form. Both sound remarkably open, transparent and inherently 'musical'. XL-600 is tremendously powerful and very compatible	426W in stereo mode, 1.5kW in bridge, R 2mm, tone + processor loop	R	74
Hafler DH120 assembled £360	Very Good Fair	Sound quality results were decent enough, but this power amp won't set the world on fire at this price	60W		44
Harman Kardon Citation 25/22 £599/£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
Jadis JP30/JA30 £3,725/£1,850	Fair Excellent	Two-box preamp plus monoblok power amps, classic valve design gives stereotype valve sound. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at frequency extremes, in lab, and re cartridge matching	30W 2-box pre-, monoblok power, R* MM-only, 4 line inputs	R*	60
Jeff Rowland Coherence One/ Model 7 £3750/£4950 each	Very Good Very Good	The technical design of these amps is very elaborate but ensures they achieve an extraordinarily transparent and potent sound. However, the CD i/p is clearly superior to the disc inputs	448W monoblok MM/MC with variable loading options. Balanced topology	R	72
Kelvin Labs Absolute Zero/M30 £395 + £295/£595pr.	Good + Average +	Latest versions of the M30 offers a true 30W Class A and a slightly muddled but very comfortable sound. MC preamp is a very linear design	33W monoblok MC only + 4 line inputs. Separate L/R balance	R	74
Kenwood KA-5500 £130	Very Good Fair	Having dropped its moving coil input, this latest version has British style dynamics and rhythm but is not first grade	35W, MM, 4 inputs, hdph, tone controls	R	62
Kenwood KA-5010 £210	Good Good	Offers a slightly bass-light but very smooth, fresh and alive sound. Well built and sensibly equipped	101W, MM/MC, CD 3 tape, tuner, aux + direct	R	74
Kenwood KA-7010 £300	Average + Average +	More powerful version of the 5010 but less successful in the listening tests. RF IMD is the likely cause.	123W, as above plus —20dB mute facility		74
Klyne SK5a £2590	Very Good Very Good	Beautifully made and presented this American thoroughbred has a good lab performance, but although versatile, is rather expensive for the quality of sound offered	Balanced output, versatile cartridge loading		72
Krell KSA-200 £5550	n/a Very Good	Value derives partly from excellence of sound, but equally from imperturbability, flexibility, consistency, build and after sales care	200W	R*	72
LFD £2,995 +	Very Good Excellent	Can set the subjective standards that others merely aspire to, but this outstanding if unconventional multi-box preamp needs careful matching to ancillary components (cartridge, power amp)	MC (with care), passive line extra	R	60
Lection JH50 £2,300	Average Very Good	Sexily presented valve power amplifier from France. Lovely valve sound too, with delicate and airy top end. Not especially powerful and rather expensive — but very desirable!	50W		78
Linn LK1/LK280 Pre/Power £495/£645	Good Good —	A very modern, logic-controlled amp with distinctive and inoffensive sound quality. Its restrained sound could do with extra insight and	84W, compact amp CMOS sw. for 2 tape, 2 line and MM/MC. XLR sockets.		68
Marantz PM35 £150	Very Good Good	This new generation Marantz is a good allrounder, and shows that extra care is being taken over sound quality; well equipped and versatile	45W MM/MC 3 line inputs tone controls		56
Marantz 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 PM94 £1,200	Very Good Good	At 23kg the PM94 is no lightweight in either physical or sonic respects. A very powerful and comprehensively equipped amplifier	140W MM/MC tone controls (switchable)		60
Marantz PM-95 £1,800	Very Good Average +	Beautifully constructed, this amp was less convincing via its digital i/p than via line. Class A option best suited to sensitive speakers. Costly	151W with 30W available in Class A. + coax inputs		74
Meridian 201/205 £599/£425 each	Very Good Good +	A fine preamp with additional luxury option of full system remote, plus competent and attractive monoblok power amplifiers with generally good performance	100W MM/MC 6 line inputs remote capable straight line	R/—	62
Mission Cyrus One £200	Very Good Good	A red hot class winner, which caused the whole issue to be re-rated! It's even well built — however, the headphone socket will only take a 3.5mm jack	30W, MM/MC, 5 inputs, hdph, straight line	BB	62
Mission Cyrus PSX £230	Very Good Very Good	The PSX does make the Cyrus Two sound better; and also improves the PCM II CD player giving more wallop and clarity	Auxiliary power supply	R	62
Mission Cyrus Two £330	Very Good Very Good	Also a top performer in its group with fine moving coil and compact disc sound. Since our review Mission has omitted the headphone socket on the Cyrus Two	50W, MM/MC, 5 inputs, straight line	R	62
Mordaunt Short MS-A5000 £350	Very Good Good	With a recognisable pedigree, Mordaunt Short engineers have made a good job of this one. A musical all rounder	50W, MM/MC, 6 inputs, hdph, tone controls	R	62
Musical Fidelity A1 £269	Good Good + +	Fine-ranking in terms of overall sound quality for money, the excessive heat output could be hazardous to your vinyl if you're careless	20W MM/MC 4 inputs straight line	BB	56
Musical Fidelity B200 £299	Very Good Good +	Running cooler than other MFs, the B200 delivered fine musical and dynamic sounds with plenty of power	80W MM/MC 4 line inputs straight line	BB	62
Musical Fidelity 3A-X/ MA100-X £379/£1,499pr.	Average Very Good	Power amps get extremely hot as a result of Class A operation. Sounds exceptionally rich, lush and effortlessly musical. Lacks transparency	105W, MM/MC + 4 line inputs, passive line out bi-wire option	R	74
Musical Fidelity A100 £459	Good + Very Good	This is another one recommended for fine sound with which you could keep your Chinese carry-outs warm	50W MM/MC 5 inputs straight line	R	62
Musical Fidelity P170 £599	Very Good Very Good	Acquitted itself well, later samples showing steadily increasing refinements	85W	R	50

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Musical Fidelity MA-50 £875 pair	Good Excellent	An audiophile bargain. One of the best sounding power amplifiers made	50W, monoblok	R	62
Musical Fidelity MVT Mk 3 £1199	Very Good Very Good	The MVT preamp was "strong in its class", providing competition for £1500-plus amplifier systems, now rivalled by the MF3B	MM/MC 5 inputs	R	50
Musical Fidelity P270 £1,399	Very Good Very Good	If the hot-box aspect is not a deterrent, this is something of a bargain. A big amplifier scale of sound which is just a little rough-edged	135W	R	50
Musical Fidelity MVX & A370 £2399/£2399	n/a Excellent	In its latest guise, the A370 confirms its status alongside the MVX as amongst the best indigenous components for both sound and presentation	MVX - MM/MC/4 line/phase invert. A370 - 150W	R	72
NAD 3020e £130	Good Fair	A little light in balance and "weight" but superior to run-of-the-mill budget amplifiers	20W MM/MC 4 inputs	R	50
NAD 3225PE £150	Average+ Average+	Light and detailed if not as rich or weighty sounding as others. MM input sounds warmer than CD	42W + 70W dyn. headroom; soft-clipping, MM only	R	68
Naim NAIT 2 £339	Average+ Fair	Well built with good load tolerance the NAIT delivered a fully competitive sound in spite of its modest measured power output. Recent modifications as yet unchecked	15W pc MM 3 inputs	R*	50
Naim Separates £560-c£8,000	Very Good Good	A consistent and coherent series of 'building blocks' for conventional passive or active operation. Sound quality ignores conventional audiophile standards of presentation, but achieves fine musical communication	40-70W, MM/MC etc	R*	60
Oakley S £499	Good Very Good	Much improved version of the original Image preamp from Yugoslavia. This one won't disgrace itself even in top-notch systems. Image Six model (£100 more) is really fabulous	MM plus 3 line inputs	R	78
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
Philips FA-880 £200	Good Average	A new and cheaper design from Philips that sounds best via MM disc. Can appear soft and unbalanced via CD	108W, MM/MC source-direct tone		74
Philips FA960 MkII £300	Good+ Average	The MkII '960 still failed to grasp our listeners' attention but it remains a competent amp nonetheless	122W, 6 line & 2 disc inputs + tone controls		68
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
Pink Triangle PIP £2670	Excellent Excellent	This state-of-the-art preamp is one of the few truly high end products to come out of this country this year. It will most certainly worry the competition	MM/MC, 4 inputs, battery supply	R	62
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
QED A240 CD II £179	Good+ Good	Latest 240CD is fine value for CD and has competent MM disc input as well	45W MM 5 line inputs straight line	BB	62
QED A240 SA II £239	Good+ + Good+	Redesigned 240SA represents a significant allround improvement over its predecessor, and provides a good moving-coil disc input in a competitive price	45W MM/MC 5 line inputs straight line	BB	62
QED A270 £349	Good- Good+	Building on the strengths of the '240, the '270 sounds weighty, fast and dynamic. A bit 'lumpy' via MC	51W, 5 line and 2 disc inputs, pre-out	R	68
Quad 34 £299	Very Good Fair	This well-built durable preamp has useful filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4 inputs MM/MC tone controls		44
Quad 405 £389	Very Good Fair	Not an impressive power amp but easy on the ear if not pushed and very reliable	100W		44
Ray Lumley Model 75 £1,995	Average Good+	Monstrous valve monobloks which represent good value. What they lack in musical subtlety they make up for in sheer muscle. And these are Lumley's small monobloks!	75W monoblok		78
Revox B150 £1,047	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 £1,467	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 RA810A £119	Very Good Fair	As a cut price RA820AII this is a very successful little amp that loses little in sound quality to its predecessor. Excellent value	20W, MM, 5 inputs, hdp, tone controls	BB	62
Rotel RB/RC850 £160/£140	Good+ + Good+	Quality separate pre and power amplifiers at near budget integrated amplifier prices. A notable achievement	60W MM/MC 4 line inputs tone controls	BB	62
Rotel RC-870BX/RB-870BX Pre/Power £219/£230	Excellent Good+	Reduced price makes the 870 combo better value but, despite mods to the preamp, it is the power amp that must take the lion's share of credit	128W or 208W in bridged mode. CD direct, 4 line, 2 tape and MM/MC	R	68
Rotel RA870BX £329	Very Good Good+	A powerful blockbuster with solid and well focused sound, good versatility and fine load tolerance	85W MM/MC 7 line inputs tone controls	R	56
SAE P102/A202 £499/£599	Average+ Average+	Microprocessor-controlled pre and power amp that sounds much better at low rather than high volume levels. Pro-oriented aesthetics	151W, MM/MC + CD tuner and 2 tape tone memory, spk switching		74
Sony TA-F200 £130	Average- Average	Over-ambitious protection circuit is hardly in keeping with modern amp design. Lean but 'dead' sound quality.	74W, 2 tape, 3 line and MM/MC inputs		68
Sony TA-F400 £200	Good Average+	Some lack of integration across the frequency range but still offers a more open and detailed sound than the 'F200	76W, 2 tape, 3 line and MM/MC inputs. Rec-out		68
Sony TA-F530ES £300	Good Average+	Chunky UK-oriented design that offers a rich, smooth and full sound. Slight loss of focus via MM/MC disc	120W, MM/MC, 4 line sources + record out + tone	R	74
Sony TAF 500ES £349	Good+ Fair	Not too hot at the price, lacking in bass action, rating poorly on vinyl, and only marginally improving on CD	75W hdp tone controls MM/MC		50
Sony TA-F630ESD £350	Good Average	Based on the '530 but equipped with PDM D/A convertor. Amp is competent but DAC sounds truly magnificent!	130W, as above + opt. and coax digital inputs	R	74
Sony TAF 700ES £500	Good+ + Fair	Scoring higher than the 500 but still not offering the sort of standards set by the competition. But many buttons to push	100W MM/MC tone controls		50
Sumo Nine+ £1200	Very Good Excellent	Macho styling of this class A stereo power amp conceals a sonic subtlety that is exceptional for the price, limited by lots of waste heat and a noisy fan on our sample (being improved)	65W	R	60
Sumo Andromeda £1585	Very Good Very Good	Well made with lots of power from a sensibly sized box. It was good in the lab and demonstrated a sound which offers a fine blend of performance at an almost reasonable price	200W, balanced input	R	72
Tannoy SR-840 £1713	Very Good Good	A "muscle" power amp, capable of impressive levels into difficult loads while remaining quite subtle and revealing	250W		50
Technics SU-V660 £250	Good Fair	Chunky build but integrated output stage infers a weak, insubstantial and rather monophonic sound	107W, MM/MC, CD aux, tape + tuner + power amp-direct		74
Technics SE-M100 £550	Very Good Good+	An unusual disc-less poweramp with volume control. Standard line input sounds very open and clean. Digital input is harsher and less convincing	123W, coax and opt digital inputs, var and direct CD no MM or MC disc	R	74

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



We guarantee to beat/match any genuine advertisers price on any hifi unit if one of the following:

KENWOOD JVC SONY

TECHNICS MARANTZ

HEAD OFFICE

124 Hanworth Road,
Hounslow, Middx.
TW3 1UG
01-577 0935
Fax: 01-569 5504

BRANCH

MAIL
ORDER
01-577 0935

16 St. John's Road
Isleworth
Middx.
01-568 0877

neat hi-fi

NORTH EASTERN AUDIO TRADERS



BOUGHT/SOLD/EXCHANGED

BUY OUR USED

QUAD : LINN : PINK TRIANGLE : REVOX :
NAKAMICHI : MISSION : HEYBROOK : CELESTION : KEF
: TECHNICS : SONY : REGA : ETC.

WITH CONFIDENCE

ALL EQUIPMENT FULLY GUARANTEED —

*VISA/ACCESS/MAIL ORDER FACILITIES

*EFFICIENT SERVICE DEPT

*SEPARATE DEMONSTRATION ROOM
(hear your chosen equipment in private)

62 HIGH NORTHGATE, DARLINGTON
(open till 8pm Thursday/Friday and between
10am and 3pm on Sundays for demonstrations)



TEL: 0325 460812

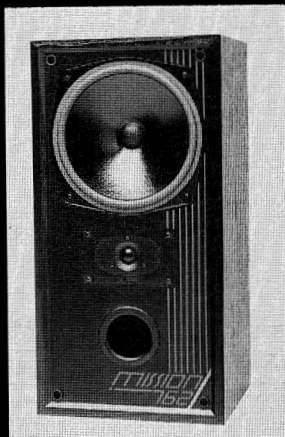


MISSION IN CHESHIRE

ELECTRONICS



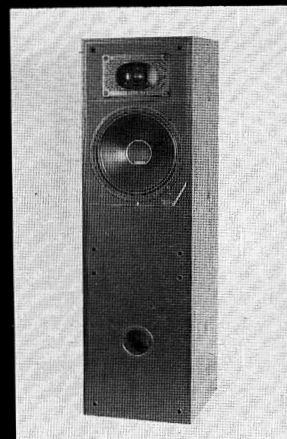
MISSION 761



MISSION 762



MISSION 763



MISSION 764

THE COMPLETE NEW MISSION RANGE IS IN STOCK AND ON DEMONSTRATION

We are also stockists for: MUSICAL FIDELITY, ALLISON, TARGET, AR, AIWA, ARCAM, AUDIOLAB, B&W, CELESTION, DENON, HEYBROOK, KENWOOD, MARANTZ, MONITOR AUDIO, MORDAUNT SHORT, NAD, PIONEER, QED, ROTEL, TANNOY.

★ FREE INSTALLATION ★ 2 YEAR GUARANTEE ON ALL HI-FI ★ FREE EASY PARKING



SWIFT OF WILMSLOW

St. Anns Parade, Parsonage Green, Wilmslow, Cheshire.

Telephone: 0625 526213

BADA

THE ULTIMATE IN
SOUND ADVICE

THE DIRECTORY

AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Vacuum State FVP £999	Good Very Good	This well thought out valve preamplifier is designed for optimum musicality and transparency, a goal which is handsomely achieved	5 inputs, MM, straight line	R	57
YBA Model 3 pre/power £995/£995	Good Good	Suited to highish sens. loudspeakers this duo produced see-through, ethereal stereo images that were more convincing towards the centre of the soundstage than at the edges	56W stereo amp MM only with 3 line i/p's. Separate L/R volume controls		72
YBA 2 pre & pwr £1395/£1695	Good + + V Good/Excellent	Superbly finished French audiophile separates, with very good space and transparency, slightly softened bass. Needs extra transformer (£300) for MC cartridges	70W MM (MC extra) straight line	R	56
YBA 1 preamp £2895	Very Good Excellent	A front line French audiophile product. Great stereo and a fine Krell style finish	MM/MC, 3 inputs, straight line	R	62
YBA 1 power amp £2995	Good Excellent	This equally well finished power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85W	R	62

* rating refers to original, tested model

LOUDSPEAKERS

Last item in the hi-fi chain, to some extent the loudspeaker is merely the slave of what has gone before, capable only of reproducing a signal as good as it is fed. Nevertheless the distortions (colorations and stereo effects) introduced by loudspeakers (and rooms) tend to be more immediately obvious than those anywhere else in the chain, so careful choosing according to taste is very important.

The average loudspeaker consists of a smallish enclosure, much of which may have begun life as

part of a tree, plus a couple of drive units hidden behind a removable grille. Inside the box lurks a simple electrical circuit known as a crossover, which divides the incoming (full range) signal into the right bits for the drivers to handle. Variations on the above formula are specifically identified in the entries. The designer's primary task is to balance the sensitivity of the loudspeaker (how loud it goes for a given electrical input) against the bass extension (how low does it go) for the given box size. After that such subtleties as coloration and

dispersion come into the equation.

Careful placement of the loudspeakers within the room is as important as the initial choice of model. For good stereo they need to be more or less the same distance from nearby walls, and preferably on similar rigid stands. The listener should be about the same distance from and listening angle to each loudspeaker. The ideal placement depends on the way a particular model has been balanced (not to mention a number of other factors), and our recommendation is given in the entries.

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Acoustic Energy AE1 £696	Good Very Good	To the author's knowledge, the most awesomely dynamic and articulate miniature ever made	29.5 x 18 x 25cm semi-open space	88dB/W 60Hz	R	59
Acoustic Energy AE2 £1138	Good Very Good	Dynamic, solid and lively, a great allrounder if a bit small considering the price, AE proves that metal cone/dome drivers really work.	39 x 23.5 x 29.5cm heavy stands in free space	88.5dB/W 45Hz	R	66
Acoustic Energy AE4 £1880 (stands £550)	Good Good	Magnificent but also seriously flawed, the AE4 possesses tremendous dynamic realism but a very mid-dominant balance. Large rooms and wallets only need apply.	54 x 32.5 x 44cm own stands in free space	90dB/W 40Hz		71
Acoustic Research Red Box £100	Average Average	Lively and balanced if a bit crude and uneven, this under-£100 econobox succeeds partly because of its simplicity, and works well with some rear wall assistance.	32 x 19.5 x 17cm close to rear wall	87dB/W 85Hz	R	74
Acoustic Research AR112 £125	Average Average-	Nicely presented and engineered, but sounds a bit small and boxy without true coherence.	36 x 19 x 18.5cm stands near rear wall	87dB/W 75Hz		66
Acoustic Research AR122 £150	Average Average	Despite a promising enough list of ingredients, the 122 failed to excite real enthusiasm amongst the listening panel	38.5 x 19 x 22cm stands near rear wall	87dB/W 68Hz		68
Acoustic Research AR132 £200	Average + Average-	Good presentation and detail engineering was not sufficient to counter bass heavy balance problems on auditioning	44.5 x 23 x 25.5cm stands 1ft from rear wall	87dB/W 50Hz		66
Alexander SE5 £189	Average Average	Particularly well suited to surround sound A/V applications, the SE5 can give any miniature a run for its money on bass performance; hardness and coloration mar-good detail and clarity, and price is a little high	40.5 x 12 x 15cm ALS stands near wall	82dB/W 50Hz (in room)		78
Allison AL105 £150	Average Average-	Pretty enough in appearance; sonically the AL105 doesn't really make the grade at the £150 asking price	37 x 24 x 21cm high stands against wall	87dB/W 45Hz (in room)		78
Allison CD6 £290	Average Good-	An unusual cube-shaped model designed for wall mounting gives exceptional bass extension from a small box, though it's also a bit heavy, coloured and slow	28.5 x 28.5 x 28.5cm stands against rear wall	88dB/W 45Hz	R	71
Alphason Amphion £680	Good Good	This fine-sounding, nicely finished compact wall-mount is just a little too expensive for formal Recommendation, but is a good performer for all that	44 x 23 x 27.5cm high stands against wall	88dB/W 47Hz (in room)		78
Alphason Orpheus £990	Good Good+	Large hi-tech two-way features unusual, sweet-sounding isodynamic tweeter; well engineered and balanced if a shade odd in appearance	65.5 x 28 x 34cm stands near rear wall	87dB/W 43Hz	R	71
Apogee Scintilla £4990	Good Very Good	These take-me-to-your-leader speakers gave exceptional transparency and can achieve excellent results in a true audiophile system	145 x 88 x 9cm free space on floor	79dB/W 20Hz	R	46
Arcam Three £150	Average + Average-	Arcam's baby speaker did not delight our listeners, but it might do better in less expensive systems	34 x 18 x 23cm close to wall at head height	88.5dB/W 95Hz		53
Arcam Two £280	Good Average	Most things to most men this compact is unlikely to disappoint with its lively "balsy" character though lacking weight... a bit	38 x 23 x 28cm near wall shelf or 40cm stands	88dB/W 55Hz		59
Arcam One Plus £380	Good Average	Provides a solid, weighty and rich sound, but is a little raw in the treble and indefinite in the midband	22.3 x 28.1 x 37.8cm open space, on stands	88.5dB/W 60Hz		59
Audio Electronics TC10 II £599	Good- Good+	Oddball appearance is rescued by a respectable technical performance, interesting and impressive engineering and fine sound quality at a realistic price.	70 x 33.5 x 33.5cm low stands in free space	87.5dB/W 40Hz	R	68
Avance 120 £279	Average + Average +	This unusual "after eighties" looking speaker has the recipe for success, but not quite the right seasoning yet	42 x 30 x 30cm 30cm from wall on 40cm stands	86.5dB/W 60Hz		53
B&W DM550 £149	Good + Average-	Beautifully presented, well engineered near-miniature with precise sound but a distinct lack of 'wellie'. Ideal for considerate flat dwellers	35 x 20.5 x 22.5cm stands in free space	86dB/W 70Hz		71
B&W DM560 £200	Average + Average-	Fine cosmetic presentation and good engineering for the price; overload protection may be handy but listening panel was underwhelmed	49 x 23.5 x 30cm stands in free space	88dB/W 55Hz		66
B&W LM1 Mk II £249	Average + Average	Probably one of the best 'micros' ever made, worth considering for special applications (boats or vehicles). Upgraded since our review	24 x 15.5 x 20cm shelf or flush mount	86.5dB/W 80Hz		31*
B&W CM1 £345	Good Average	Cleverly thought out luxury design package is also fundamentally well engineered, if a shade pricey on 'sound for pound' basis	24.5 x 16 x 22cm close to rear wall	84dB/W 90Hz		74
B&W DM1600 £369	Good Good	Crisp, dynamic loudspeaker with tight but not especially deep bass and a tweeter that sometimes sounds overcooked	49 x 23.6 x 30cm free space, open stands	87.5dB/W 60Hz	R	59
BLQ Q2 £275	Average- Average	Nearly a good loudspeaker, the basic balance is good, but the midband is very uneven and there are severe losses of resolution, 'space' and dynamics	43 x 25.1 x 24.5 semi open on stands	87.5dB/W 70Hz		59
Bose Interaudio 3000XL £140	Average Average-	Lots of perceived value and well enough balanced, but low cost cabinet and driver engineering results in a crude and unsubtle sound	46.5 x 29 x 23cm stands in free space	89dB/W 45Hz		71
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

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

Your invitation to visit . . .



The most comprehensive selection of Hi-Fi in the North West

Visit BEAVER HI-FI and view our permanent exhibition of brand-name 'state of the art' equipment.

Probably the widest range of HI-FI exhibits in the country are available at the touch of a button via our extensive comparator system; it gives millions of component permutations, enabling you to hear your individual choice of system. A private listening studio is also at your disposal.

Our staff, with a combined total of over 80 years experience in the trade, will be more than happy to help you in your quest to find your 'ideal sound'.

The venue for this exhibition – in the centre of LIVERPOOL – is the best of its kind. We have just finished our latest complete rebuild in order to project our store firmly into the nineties.

And not only is this probably the biggest exhibition you will ever visit, but also the longest running, having been established 57 years ago. How can you refuse an invitation like this?



■ HUNDREDS OF SYSTEMS PERMANENTLY ON DISPLAY

■ ALL THE MAJOR MANUFACTURERS REPRESENTED

■ HELPFUL STAFF WHO KNOW WHAT THEY'RE TALKING ABOUT

■ LOWEST PRICES GUARANTEED

■ DEMONSTRATION ROOMS

■ PART-EXCHANGE WELCOME

■ COMPARITOR DEMONSTRATIONS

■ OPEN 6 DAYS 9.30-5.30

■ CREDIT ARRANGED

BEAVER HI-FI

20-22 Whitechapel
Liverpool L1 6EH
Tel: 051-709 9898
Fax: 051-708 7105



Licensed Credit Brokers



THE DIRECTORY

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Boston A4011 £120	Average Average—	Competent performance for size and price but below average relative to the UK competition	34 x 21 x 20cm on stands near wall	88.5dB/W 63Hz		41
Canton Plus S £140	Average Poor	Bright treble and virtual absence of any bass at all is too high a price to pay for an almost invisible loudspeaker	20 x 12 x 12cm against rear wall	87dB/W 130Hz		74
Canton Karat 20 £300	Good+ Average+	Very pretty finished and accomplished near-miniature, the bright-sounding '20's only difficulty lies in justifying its high price	34 x 22 x 20cm stands in free space	87dB/W 55Hz	R	71
Canton Karat 30 £360	Average+ Average	The slightly 'boom'n'tizz balance is attractive at low levels, but starts to pall as the dynamic range is explored. Pretty though	42.5 x 26.5 x 28cm solid stands	88dB/W 35Hz (in room)		78
Canton Karat 40 £550	Average Average	Pretty and compact three-way for those who mourn the passing of the loudness control — definitely errs on the boom'n'tizz side	50 x 27 x 27cm stands in free space	88dB/W 50Hz		71
Canton 60 Karat £630	Average+ Good	Looks a bit of a throwback designwise, but is nicely presented and has a lively, dynamic and generous sound	58 x 31.5 x 31cm stands in open space	90dB/W 48Hz	R	66
Castle Clyde £149	Average+ Average	A tidy little performer packing punch, but beginning to show its age in the light of new competition	37 x 21.5 x 22cm open space on stands	89.5dB/W 64Hz	R	46
Castle Durham £199	Average+ Average	Listening results were encouraging, well engineered and finished, but lean on treble and a bit weak on bass; still recommended	41 x 21.5 x 25cm near rear wall	89dB/W 67Hz	R	46
Castle Pembroke £309	Good Average+	Comfortably recommended, a sweet smooth sound with good overall balance of engineering-based performance	55 x 37.5 x 30.5cm open space on stands	88dB/W 46Hz	R	31
Castle Warwick £169	Good Average—	Excellent presentation and fine engineering with overload protection, but a sonic disappointment in bass and dynamic qualities	46.5 x 25 x 23cm stands 1ft from rear wall	88dB/W 50Hz		66
Celef Cirrus £180	Average Good	It's nice to see Celef back in the UK, with this decent sounding small reflex box that seems unusually tolerant of siting	39 x 20.5 x 23cm stands in free space	84dB/W 60Hz	R	66
Celef CF2 Nimbus £230	Good— Good—	Nicely balanced overall but a little uneven with it, this lively and dynamic large bookshelf model came close to Recommendation	46 x 25.2 x 24cm stands in free space	88dB/W 55Hz		71
Celestion 3 £109	Average+ Average	This attractive little wall-mount gives good balance and stereo imagery, with a character which leans more towards inoffensiveness than excitement	31 x 18.5 x 21cm high stands against wall	86dB/W 55Hz (in room)	R	78
Celestion DL6 Series Two £159	Good Average	Good tonal colouring and plenty of bass for the enclosure size; the metal dome tweeter is excellent, but bass and mid lack clarity and 'bite'	45.4 x 24.5 x 26.2cm near wall, on stands	87dB/W 65Hz		59
Celestion DL8 Series Two £199	Very Good Good	A refined middle market speaker has a smooth but slightly dull quality, with good definition and deep, if slightly boxy bass	50 x 27.5 x 27.8cm open stands	87.5dB/W 60Hz	R	59
Celestion SL12Si £579	Average Average	Careful setting up does reveal elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling	53 x 20 x 27cm matching stands clear of walls	85dB/W 50Hz		66
Celestion SL600Si £799	Good+ Good	This Aerolam high tech miniature has certain remarkable qualities that some will find irresistible, and which go a long way towards justifying the highish price. Needs careful system and room matching.	27 x 20 x 23cm matching stands in free space	82dB/W 52Hz		68
Celestion SL700 £1349 inc stands	Good Good	Very sophisticated, mostly smooth and accurate transducer, with fast but not very deep bass and a rather bright treble	37.5 x 20 x 23.5cm free air on tall stands	83dB/W 45Hz		60
Celestion 6000 £1470	Very Good Very Good	A genuine fullrange audiophile quality speaker system — with Star Wars styling to suit a high tech environment	Complex, on floor in free space	82.5dB/W	R	60
Chameleon 500 £349	Average— Average—	Sounding badly coloured, dull and compressed, it is also amateurishly constructed, despite using good quality materials	38 x 25.3 x 31.3cm free stands	89.5dB/W 75Hz		59
Duntech PCL500 Marquis £3998	n/a Very Good	Better value for money than the Crown Prince — and arguably more dynamic, with real bass 'slam' — but a little less refined in the higher registers	147.5 x 27 x 40 free standing away from walls	92dB/W 48Hz	R	65
Duntech PCL1000 Crown Prince £6120	n/a Very Good+	Immensely 'listenable', refined sounding speaker capable of creating lifesize musical images. Not overly transparent to source, but very civilised nonetheless	180 x 30.5 x 43.5 free standing away from walls	90dB/W 42Hz	R	72
Energy 22 Pro Monitor £600	Good Good	Presentation is a bit rough for the price, but this Canadian entrant is an impressive sonic allrounder that will appeal to most listeners	62.5 x 27 x 30cm stands in free space	87dB/W 40Hz	R	66
Gale 301 £300	Average Average+	Of unusual, distinctive appearance this produced a mixed response, being lively but lacking depth	44 x 23.5 x 22cm on stands quite near wall	86.5dB/W 63Hz	*	46
Gale GS402 £700	Average+ Average+	Clean but rich and powerful bass; stereo focus was not a strong point, but it is worth considering. (Recent revisions not checked)	61 x 35.5 x 28cm on matching stands near wall	88dB/W 48Hz	*	46
Goodmans Maxim Two £90	Average+ Average	More wham-bam-thankyou-mam sound that imitates much bigger speakers when you let these babies yell. (A well-controlled yell)	26 x 17 x 19cm near wall on shelf or stand	86dB/W 85Hz	BB	59
Goodmans B-Max/Maxim Two £90 + £90	Poor Average—	Stick with the Maxims' on their own until you can afford some real grown up loudspeakers	60 x 21 x 26 + 2x (26 x 17 x 10)cm suck and see	89dB/W 55Hz (in room)		78
Goodmans Point 3 £100	Average+ Average—	Recommended as good value for money, but our listeners' differing opinions mean your ears should judge for themselves	47 x 25 x 20cm shelf/high stand near wall	90dB/W 80Hz	R	53
Goodmans Sterling Point 5s £130	Good— Average—	Looks a remarkably good deal with apparently good engineering, but the room drive is mid-dominant and the sound is loud but not that likeable.	56 x 29 x 26cm stands in free space	89dB/W 60Hz		71
Goodmans Point 7 £180	Average+ Average	Basically competent performance-mix and a lot of speaker for the money, but a certain lack of refinement nonetheless	69 x 33 x 26cm free space on 35cm stand	89dB/W 47Hz		53
Harbeth LS3/5A £330	Good Average	Still a classic miniature, though not to every taste, and none the better for the recent update under our listening conditions. Limited dynamic range	30.5 x 19 x 16cm stands in free space	81dB/W 60Hz		66
Harbeth HL Compact From £499	Very Good Average	The clean and neutral sound lacks resolution and gives rather unobtrusive though well differentiated stereo. Can be bi-wired to advantage	52 x 27.2 x 28.1cm open space, on high stands	87.5dB/W 65Hz		59
Heco Interior 90S £129	Good Average—	Neatly finished and engineered miniature, but the disappointingly 'lifeless' sound left the listening panel decidedly underwhelmed	27 x 18 x 16cm on high stands	87.5dB/W 90Hz		74
Heco Interior 120 £149	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 430s £399	Good Good—	This tall floorstanding enclosure delivers an impressively even sound balance with good bass extension, if not the lively dynamics to satisfy enthusiasts	85 x 24 x 27.5cm free space	88dB/W 43Hz	R	71
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
Heybrook Point 5 £139	Average Average	"Uncouth yet still satisfying", the Point 5 gives good dynamics and bass for a compact wall-mount, but is burdened by a somewhat unhappy treble	37.5 x 23 x 24cm high stands against wall	85dB/W 32Hz (in room)		78
Heybrook Point 7 £185	Average Average	Physically an attractive package, but not entirely convincing in lab or listening panel test; interesting for all that	40.5 x 23 x 23cm stands against rear wall	85dB/W 60Hz		68
Heybrook HB1 £199	Good Average+	No longer an over-bright character, a strikingly clear sound and fine transient performance now merits recommendation	47 x 29 x 23cm on stands near wall	88dB/W 61Hz	R	46
Heybrook HB100 £255	Average+ Good	Well matched for wall siting, the HB100 is a lively and informative performer in the tradition of the popular HB1	47 x 26 x 28cm stands near rear wall	86dB/W 50Hz	BB	66

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Heybrook HB200 £399	Average Average	This luxury successor to the HB2 is lively and informative, but sounded insufficiently balanced to convince our listening panel	46 x 23 x 26cm stands against rear wall	87dB/W 55Hz		66
Infinity RS2001 £169	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	36.5 x 22.5 x 20cm lightweight stands	87dB/W 50Hz (in room)	R	78
Infinity Kappa 6 £795	Good Good	Interestingly styled US loudspeaker has unusual high tech drivers and good neutrality, but the sound seriously lacks excitement	63 x 38 x 24cm stands, free space	85dB/W 35Hz		66
Infinity Kappa 8 £1795	n/a Good++	Very nicely made and unobtrusive but large four-way speakers which have a tendency to sound bass heavy unless used with solid core cables	118 x 51.5 x 17.5cm floor standing, open space	89dB/W 33Hz		72
Jamo Concert 2 £230	Good Average-	A thoroughly respectable 'bookshelf' performer that needs free space siting but includes attractive cabinetwork and a neat grille	41 x 24 x 25cm stands in free space	85dB/W 48Hz		66
JBL TLX12 £149	Good- Average	This smart near-miniature has a 'boppy', lively bottom end, but beware of the fizz in its	37 x 23 x 23cm stands 0.5m from rear wall	87dB/W 55Hz	R	71
JBL LX44 £340	Good- Average	This generously built model offers good power handling, bass extension and dynamic range, but suffers from the 'three-way syndrome', with middle middle	58.5 x 30 x 29cm stands in free space	89dB/W 40Hz		71
JPW Sonata £99	Good Average+	Well balanced and integrated, this near-miniature offers fine sound if limited bass and dynamic range, plus real tree wood at a nearly silly price	32 x 23 x 20cm stands near rear wall	86dB/W 55Hz	BB	71
JPW P1 £139	Good Average+	Honest and basically articulate if not very sophisticated, resolution is good but it can sound a little wearing in bright systems or with rough sounding material	44 x 25.9 x 26.1cm free space on stands	89dB/W 60Hz	R	59
JPW AP2 £165	Good Good	Few grounds for criticism but purchasers should check out the treble qualities to avoid hammering the ear anvils	46 x 26 x 25cm 40cm from wall on 45cm stands	89dB/W 65Hz	R	53
JPW AP3 £219	Good Average+	Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52 x 25 x 29.5cm near wall on stands	90dB/W 57Hz	R	46
KEF C15 £99	Good Average	One of the tiniest around delivers a surprisingly 'big' and well balanced sound, with excellent stereo from free space siting	26.5 x 18 x 14cm stands in free space	85dB/W 60Hz	R	71
KEF C25 £139	Average+ Average-	Very safe and competent, but rather short on inspiration, the '25 lacks the brio and flair of its smaller C15 brother	34 x 20.5 x 17cm high stands near wall	87dB/W 60Hz (in room)		78
KEF C75 £349	Good Good	Compact floorstanding model's Uni-Q driver provides fine crossover integration, giving stable stereo and fine dynamic range within a slightly 'rich' balance	72 x 24.5 x 25.5cm floor in free space	90dB/W 45Hz	R	71
KEF R102 £365	Very Good Very Good	High class near-miniature with expressive, articulate midband and clean, accurate bass and top. The sound quality of the Kube circuitry, however, is suspect; what would an audiophile Kube sound like?	33 x 20.7 x 26.3cm near wall or open on stands	89.5dB/W 60Hz	R	59
KEF C95 £599	Good Good	Rich and lazy, but nonetheless very endearing in a cosy sort of a way, the '95 is a lot of speaker for the money, and delivers a bass sound with grace and subtlety	88.5 x 24.5 x 31cm floor in free space	90dB/W 28Hz (in room)	R	78
KEF 103/3 £680	Good+ Good	Technically impressive, excellent bass/power handling for size, but not for the audiophile system. Better among cheaper components, and good in a large room	56 x 27 x 30cm supplied stands free space	90-95dB/W 35Hz		53
KEF 104/2 (inc KUBE equaliser) £895 (£994)	Very Good Good++	A reference point for dynamics, preferred without KUBE, suited to many rooms. Good stereo, high sound levels	90 x 28 x 41.5cm floor standing in free space	92dB/W 50Hz	R	60
KEF 107 £2025	Very Good Good+	A welcome sense of ease and lack of strain at most normal levels. Minor criticisms included a dulling in the extreme treble. Excellent bass extension	116.5 x 33 x 45cm on floor in free space	87.5dB/W 20Hz	R	60
Linn Helix £279	Average+ Good	Attractive presentation is coupled with an attractively lively sound which is more neutral if less committed than earlier Linn loudspeakers	51 x 25.5 x 28cm stands 1ft from rear wall	88dB/W 53Hz	R	66
Linn Kan 2 £339	Average+ Average+	A niche product for those prepared to tolerate its strong character for the sake of its fine bass performance and near invisibility	30.5 x 18.5 x 16.5cm Kan stands against wall	82dB/W 35Hz (in room)		78
Linn Nexus £379	Good Average	Good features include a solid, meaty bass plus good imagery and tonal balance. The catch is that Nexus lacks resolution and timing	49 x 23.5 x 30.4cm near rear wall supplied stands	89dB/W 60Hz		59
Magneplanar SMGa £675	Average- Average	Tonally 'rich', in the right room it proved a satisfactory musical experience	122 x 48 x 4.5cm on floor clear of wall	85dB/W 56Hz		46
Magneplanar MG1.4 £1190	Good+ Good+	Replaces the stalwart MG1c with a revised panel layout. Offers a very crisp and articulate sound, particularly revealing of upper mid vocal details	155 x 8 x 57cm open space	88dB 40Hz	R	72
Magneplanar MG2.5R £1998	Good Good	Offers the low coloration and profound musical insight of better electrostatic loudspeakers but without loss of low frequency extension	183 x 56 x 4.5cm Open space	83-85dB/W 35Hz	R	60
Magneplanar MG11a £2700	Good Very Good	Another excellent true-audiophile loudspeaker this American panel speaker helps to convey much of the original character of the music	180 x 62 x 38cm well clear of walls	84-86dB/W 35Hz	R	46
Marantz LD20 DMS £170	Average Average	Recommended more for CD users than vinyl keepers, soundly engineered and built but should be heard before bought	36 x 23 x 24cm free space on 45cm stands	86.5dB/W 55Hz		53
Marantz LD50DMS £200	Very Good Good-	Well behaved larger two-way has fine balance, stereo and integration with good bass extension, albeit with mild 'boxy', 'chesty' and 'fizzy' effects	42.5 x 27 x 28cm stands in free space	87dB/W 50Hz	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
MB Quart 22Q £270	Average- Average	The elaborate and pretty enclosure in a wide range of finishes works better than the drivers and crossover, which impose a lumpy balance	30 x 22.5 x 21cm stands in free space	87.5dB/W 80Hz		74
MB Quart 280 £340	Average- Average	Despite redoubtable build quality and good dynamics, the 280 has a rather 'obvious' mid bass and a balance that adds rather too much of its own character	44 x 27 x 29cm	88dB/W 40Hz (in room)		78
MB Quart 390 £469	Below Average Poor	An aggressive, messy sounding design whose uncouthness undermines the positive level of detail	52 x 31 x 30.5cm open space, on stands	89.5dB/W 60Hz		59
Meridian M30 £775	Average+ Average	Priced but easy on the ears and worth considering especially where space is at a premium	38.5 x 18 x 32cm free space on stands	Active 40Hz		46
Mission 761 £120	Average Good	One helluva speaker for the price, if a shade small and short of subtlety and refinement - should prove a worthy successor to the 70 and 700	38 x 21 x 21cm stands near rear wall	87dB/W 60Hz	BB	66
Mission 762 £180	Average Average-	Mission's 'bookshelf middleweight' offers high sensitivity and loudness capability, but at the expense of a somewhat untidy and rather 'heavy' sound	50 x 25 x 27cm stand, experiment advised	91dB/W 55Hz		66
Mission Cyrus 781 £240	Average+ Average+	Superb build, finish, presentation and engineering for the price, this romantic sounding Cyrus needs careful system matching to achieve good results	43 x 22.5 x 28cm medium stands near wall	88dB/W 40Hz (in room)		78
Mission 763 £280	Average+ Average+	A very artful combination of generous volume and good bass extension at a modest price. Works well in the listening room despite a few rough edges	77 x 25 x 32cm near rear wall	86dB 40Hz	BB	68
Mission Cyrus 782 £340 (stands £80)	Good- Good-	Lively, articulate and beautifully finished, this compact wall-mount model with twin main drivers has good integration but a rather rich, 'loudness' balance	50 x 25 x 32.5cm Cyrus stands near wall	90dB/W 50Hz		71
Mission 764 £400	Good Good-	Large floorstander has fine bass extension but limited dynamic range, and sounds 'lazier' than Best Buy 763	86 x 25 x 32cm 0.5+m from rear wall	86dB/W 43Hz		71
Monitor Audio Monitor 7 £150	Average- Average	This lively and punchy near-miniature looks pretty enough and is good value but is let down by an uncouth and indifferently integrated tweeter	34 x 16.5 x 17cm stands 1ft from wall	84dB/W 70Hz		74

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Monitor Audio Monitor 9 £190	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, though it's nevertheless a very competent overall design	37 x 20 x 21cm high stands near wall	84dB/W 40Hz (in room)		78
Monitor Audio R300/MD £250	Average Average—	An attractive 'large bookshelf' model that's handicapped by poor crossover and integration between paper cone bass and metal dome tweeter	47.5 x 25 x 30.5cm stands in free space	88dB/W 50Hz		71
Monitor Audio R352/MD £299	Average+ Good	A good value large box that sounds more engaging than subtle, providing a good compromise between bandwidth and sensitivity	64 x 25 x 32cm stands in free space	89dB/W 45Hz	R	66
Monitor Audio R852/Gold MD £449	Good Good	Luxury build and 'high tech' tweeter or not, this compact model offers good refinement and detail on an open soundstage	45 x 25 x 26cm stands in free space	86dB/W 50Hz	R	66
Monitor Audio 1200 Gold MD £799	Average Average+	This smooth and civilised slimline floorstanding loudspeaker is well built and nicely presented. But it is also expensive	94 x 20 x 26cm in free space	85dB/W 48Hz		68
Mordaunt-Short MS10 II £90	Average Average—	One of the best miniatures around. A borderline Best Buy because of the bass limitations, which may depend on your taste	29 x 20 x 17cm wall bracket	86dB/W 75Hz	R	53
Mordaunt-Short 3.10 £99	Average Average+	Probably the liveliest and most communicative miniature around, this beautifully presented design is probably better suited to budget 'real hi-fi' than the blandness of the midi system	28.5 x 17.5 x 20cm high stands near wall	84dB/W 50Hz (in room)	BB	78
Mordaunt-Short 3.30 £180	Average Average+	A little too mid-forward for neutrality or formal recommendation, this attractive, good-sized model nevertheless has more than enough appealing qualities to merit serious consideration	46 x 23.5 x 27cm high stands 1-2ft from wall	87dB/W 38Hz (in room)		78
Mordaunt-Short MS100 £189	Average+ Average+	A 'mid forward' tonal balance is its main drawback but other aspects such as ambience, transparency and stereo depth compensate	32.5 x 22.5 x 21.5cm stands near wall	85dB/W 80Hz	R	46
Mordaunt-Short 45Ti £230	Good Average	A sensitive tandem-bass number that can be driven loud but loses its balance a bit and can be unsubtle	63 x 26 x 30cm low (20cm) stand near wall	90.5dB/W 52Hz		53
Mordaunt-Short MS300 £319	Average+ Average+	Not considered particularly competitive in its class, though it has good power handling and stereo focus	54 x 22.5 x 25cm on stands near wall	89dB/W 65Hz		46
Mordaunt-Short 442 £1150	Good+ Good++	A resounding success with the listening panels. Make sure your room can accommodate the bass	95 x 26 x 38cm floor standing in free space	87.5dB/W 40Hz	R	60
Musical Fidelity Reference 2 £199	Good— Good	This compact wall-mount design with advanced drivers has good dynamics, balance and stereo, plus flashy styling and some midband 'boxy' coloration	38 x 25 x 20cm stands near rear wall	88dB/W 50Hz		71
Musical Fidelity MC-2* £299	Very Good Good++	This exceptionally clean and clear design offers real subtlety and finesse. Bass quality is light but exceptionally clear; the treble is smooth if slightly shallow	48.5 x 25.5 x 16.5cm open space and stands	87.5dB/W 65Hz	BB	66
Musical Fidelity MC-4* £499	Very Good+ Good++	Achieving a very high standard, the MC-4 sounds detailed and coherent like the MC-2, but with more bass depth and solidity, and large image scale	56.5 x 26.9 x 29cm open space on stands	87.5dB/W 60Hz	R	59
NVA Cube 1 £600 (stands £200)	Good— Good+	Attractive, cube-shaped semi-omni is very sturdily built, and gives an idiosyncratic but unusually open, spacious and informative sound	33 x 32 x 32cm own stands c0.5m from wall	85dB/W 52Hz	R	71
NVA Cubix £1,100	Average Good	Too idiosyncratic for formal recommendation, the Cubix possesses remarkable bass extension for its size, but is tricky to optimise and has some aggressive tendencies	60 x 32.5 x 32.5cm low stands against wall	88dB/W 20Hz (in room)		78
Opus 3 Credo £399	Average Average	Credo's odd-shaped silicate-based cabinet confers good box and bass performance, but the sound could be more neutral for the price	32 x 28 x 32cm stands in free space	88dB/W 65Hz		74
Opus 3 Capella £599	Good Good	The sound of this Scandinavian curiosity certainly benefits from the crushed marble enclosure, though presentation is strictly DIY	32 x 40.5 x 26(ave)cm amongst books in bookcase	86.5dB/W 45Hz		66
Pearl & Oakley Victoria 200 £900	Average— Average—	Extraordinary – and to many very attractive – 'ginger jar' presentation in Staffordshire ceramics, but let down by need for further acoustic and mechanical development	93 x 33 x 33cm on floor in free space	87dB/W 30Hz (in room)		78
QLN Signature £1,100	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 £1690	Good+ Good++	With its unusual but subtle characteristics this classic electrostatic may not be punchy in the bass, but has strengths that some cannot live without	92 x 66 x 27cm open stand well clear of wall	84dB/W 34Hz	R	60
Richard Allan CD5 £184	Average— Average—	This neatly presented small reflex design can sound engagingly communicative, but is flawed sonically and technically and quite expensive too	38 x 19 x 23cm on rigid stands	88dB/W 80Hz		68
Rogers LS4A £219	Good Good—	This artfully voiced and well balanced compact gives a fair flavour of the classical 'BBC sound' at a very reasonable price	43 x 25.5 x 24.5cm stands 1ft+ from wall	87dB/W 32Hz (in room)	R	78
Rogers LS7t £399	Good+ Good+	A fine combination of classic qualities at reasonable price produces the "R" tag, but try to get a pair home on approval to check for bass 'heaviness'	56 x 27 x 28cm free space on 40cm stands	88.5dB/W 48Hz	R	59
Rogers Studio 1a £579	Very Good Good—	The classic BBC monitor style sound sensitively updated – transparent and natural with fine stereo, but a touch 'heavy' in balance	63.5 x 30.5 x 30.5cm stands in free space	87dB/W 36Hz	R	66
Rotel RL810 £99	Average+ Average—	A competent but not particularly inspiring miniature – little to criticise but not much to get excited about either	30 x 18 x 17.5cm stands near rear wall	83dB/W 55Hz (in room)		78
Rotel RL850 II £130	Average+ Average+	Strongly recommended. Well-balanced, clear, with decent focus and fine stereo, but tendency to 'heaviness' needs decent stands and space	44 x 25 x 24cm free space on 40cm stands	86.5dB/W 50Hz	BB	59
Royd A7 Series 11 £99	Average+ Average	Lively clear sound; good upper bass and dynamics, but treble "ramp" made vocals sound shut in. Try before you buy	31 x 20 x 17cm shelf or 50cm stands near wall	86dB/W 75Hz	R	53
Royd Eden £235	Average Average+	Delightful mid/treble speed and transparency but determinedly bass light, this oddball miniature threatens cult status but could use a sweeter tweeter	31 x 20.5 x 18.5cm stands close to rear wall	87dB/W 85Hz	R	66
Royd Apex £485	Average+ Good	This upgrade-flexible floorstanding transmission line is fine value for money: 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
Ruark Swordsman £200	Good Average	Very attractively styled and finished, the Swordsman is a well built 'small bookshelf' model that delivered better test than listening results	38.5 x 20 x 27.5cm stands 0.5m from wall	84dB/W 50Hz		71
SD Acoustics OBS £695	Average Good+	Large but unusually pretty, needs a big(ish) room and has a sting at the top, but the transparent dipole midband provides an unusually open and dynamic sound	102 x 35 x 25cm spiked, in free space	86dB/W 45Hz	R	71
SD Acoustics S01 £1150	Average Very Good	A large scale, airy and unusually detailed system with excellent dynamics. Balance is light and bright, and the original model could upset some systems/listeners. Current model has more civilised top-end and warmer overall balance	123.5 x 38.2 x 31.9cm free standing, away from walls	90dB/W 50Hz	R	60
Shan Shimna £280 (stands £75)	Average+ Good—	Pretty little miniature in cast mineral/plastics has limited dynamic range and could sound smoother, but integration is good and box effects slight	31 x 16 x 17cm stands near rear wall	84dB/W 65Hz	R	71
Snell Type C £2350	n/a Very Good	Precise, yes, but an extremely capable loudspeaker. Musical and transparent; excellent bass extension	112 x 38 x 33 free standing away from walls	90dB 35Hz	R	65
Sony APM-101ES £99	Good Average	Big hearted sound from small bookshelf successor to BB 10ES, sounds a little untidy at frequency extremes, so suits CD better than vinyl	39.5 x 22.5 x 23.5 stands in open space	86dB/W 52Hz	R	71

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
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 large room, free space	88dB/W 30Hz (in room)	R	78
Sony APM-181ES £300	Very Good Average	Big and beefy but also somewhat fat and bass heavy, this well engineered three-way has notable strengths but lacks transparency and sounds better at lower levels	57.5 x 29 x 36cm stands in open space	87dB/W 40Hz		71
Sony APM 66ES £700	Average+ Average+	Powerful heavyweight sound with a brilliant midband – clear articulate and transparent. But the bass is on the boomy side and the treble can sound grainy	66 x 38 x 36.5cm open space, low stands	89dB/W 60Hz		59
Spendor SP2 £470	Very Good Good+	Conceding little to the SP1, this 30 litre model displayed good tonal balance with a highly articulate midrange, only slightly marred at frequency extremes	50 x 25 x 30cm free space, stands	87dB/W 45Hz	R*	59
Spendor SP1 £710	Very Good Good	A very subtle and musical performer that works particularly well with digital material. An exceptional allrounder	63.5 x 29.5 x 30.5cm stands in open space	87dB/W 41Hz	R	60
Spendor SA3 Passive £1500	— Good+	Same as Spendor SA3 active	85 x 38 x 46cm low	89dB/W 32Hz	R	46
Spendor SA3 Active £2900	Good+ Very Good	Substantial speakers designed to deliver high sound levels and killer bass. Suited to larger rooms and power hungry ears	85 x 38 x 46cm low rigid stands in free space	89dB/W 32Hz	R	46
Spica TC50 £599	Good— Good	This triangular-profile 'grown up' miniature is a shade boxy and laid back but has good rhythmic and musical integrity	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica TC50SE £799	Good— Good	A heavily UK-modified TC50, the SE sounds less boxy and more spacious, but lacks some of the urgency of the standard model	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica Angelus £1295	Good Average	A little bass shy and soft in the bass and lower mid, the Angelus is otherwise tidy, extremely lively and fluid, if uneven overall	116.8 x 53.3 x 26cm free standing away from walls	86.5dB/W 50Hz		60
Studio Power Sapphire £100	Poor Average—	Balance difficulties are improving, though still prevent the potential of this interesting metal-cone new miniature from being fully realised	30 x 20 x 19.5cm stands near rear wall	85dB/W 70Hz		66
Sugden CL £275	Average+ Good—	A thoroughly impressive and likeable near-miniature, the CL is prettily and properly built, and needs a good driving amplifier	35.5 x 18 x 26.5cm high stands in free space	86dB/W 35Hz	R	78
Tannoy M15 Mercury £170	Good Average+	Somehow lacking the magic of its predecessors, the M15 remains a fine value compact that needs careful set-up to give optimum results	50 x 25 x 21cm Blu-tack to stands 1-2ft from wall	88dB/W 40Hz (in room)	R	78
Tannoy DC1000 £200	Average Average—	The smaller of two DC models with dual concentric drivers, the '1000 is much less well balanced than the larger, floorstanding '2000	50 x 24 x 25cm	91dB/W 53Hz		71
Tannoy DC2000 £300	Good Good	Remarkably high sensitivity from unique dual concentric driver that has an involving but characteristic sound. Bass could be better	68.5 x 26 x 27cm floor in free space	93dB/W 55Hz	R	66
Tannoy DC3000 £600	Good Good	Giving new meaning to terms like dynamic range and headroom, the magnificent '3000 is a must for those who enjoy high-level monitoring. But spare a thought for the neighbours	94 x 26 x 31cm floor 1ft+ from wall	94dB/W 30Hz (in room)	R	78
Tannoy Westminster £3600	n/a Good+	These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge, flat against rear wall, away from corners	96dB/W (manuf.)	R	Coll
TDL Studio 1 £549	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 low stands in free space	84dB/W 25Hz (in room)	R	78
TDL Monitor £1600	Very Good Very Good	Fine solidity and good accuracy, with enough bass extension to satisfy even organ freaks. Needs a big room and can sound a bit lazy and a shade tinkly	118.5 x 30 x 47cm 0.5m from walls	85dB/W 28Hz	R	66
Technics SBC 250 £130	Average+ Average—	Despite a fairly even tonal balance, the 250EK sounded muddled in the midrange and dull in character	36.5 x 23.5 x 20.5cm free space, stands	86dB/W 60Hz		46
Technics SB-RX50 £500	Very Good Average+	With its unique coaxial drive unit the RX50 proved a smooth and well balanced loudspeaker, its minor weakness being a mildly excessive low bass	48 x 30 x 26cm free space on 40cm stands	86dB/W 40Hz	R	46
Toshiba SS33-M £100	Average Average	Providing a benchmark for budget loudspeakers, this Toshiba-inspired but UK designed and manufactured model is a lot of loudspeaker for the money, if a shade on the cheap	40 x 26 x 21.5cm stands in free space	86dB/W 55Hz	BB	68
Townshend Glastonbury II £1700	n/a Very Good	What? No bass? Actually, like the KEF 107, Glastonbury II goes down so low you might not notice how good it is. A truly remarkable performer. Superb soundstaging too	91.5 x 28 x 46 free standing in room corners	88dB 27Hz	R	65
Videotone Minimax 2 £80	Poor Average—	Cheap in build and QC as well as price, but cheerful (if coarse) with it – if a little too cheerful after extended listening...	27.5 x 17 x 20cm near rear wall	84dB/W 90Hz	R	74
Visonik David 6000i £160	Average— Poor	Sharp styling a classy looking miniature makes, but the complex grillework worsens a sound which starts off with too much 'air' and not enough bottom	20 x 12 x 13cm against rear wall	85dB/W 130Hz		74
Wharfedale Delta 30 £80	Good Average	Very clear and surprisingly neutral for the price, with good dynamics and stereo within limited volume ceiling	37.9 x 20 x 16.9cm near wall on high stands	88.5dB/W 80Hz	BB	59
Wharfedale Delta 50 £100	Average+ Average—	"There's nothing obviously wrong, but it seems a bit mundane," is what we said when the Delta 50 was £129. But since then the price has dropped by 30 per cent, making it great value	48 x 27 x 19cm near wall on 40cm stands	88dB/W 55Hz		53
Wharfedale Diamond III £100	Below Average Average—	This latest version of the long running Diamond sports a better tweeter, but bass, though deep, is soft, and the midband is indistinct and uneven	24 x 18.5 x 20.5cm near wall, stands	86.5dB/W 75Hz		59
Wharfedale Super Diamond £140	Average Average—	Although there are improvements on the basic "legendary" model, listening panelists did not get airborne about this upgrade	24 x 19 x 19cm close to wall at head height	88dB/W 57Hz		53
Wharfedale 504/2 £150	Average Average	Not strictly accurate, this musically involving miniature sounds unusually coherent and well integrated, if a shade dull in balance	29 x 18.5 x 19cm stands against rear wall	84dB/W 60Hz	R	68
Wharfedale 505/2 £180	Average Good	This lively Wharfedale provides plenty of speaker with unusual refinement for the money, and should be fairly tolerant of room siting	44 x 25.5 x 24cm stands 1ft from wall	86dB/W 55Hz	BB	66
Wharfedale 507 £219	Average+ Average—	Generous in size but ungratifying sonically, the 507 doesn't seem to gel in the way the smaller 505.2 does, finding a good in-room balance difficult to achieve	49 x 25.5 x 29.5cm high stands 1ft+ from wall	86dB/W 35Hz (in room)		78
Yamaha NS 1000M £899	Good Good+	Living up to its monitor label, and tonally well suited to digital material, the NS 1000M is superbly crafted and capable of high levels	67.5 x 37.5 x 32.5cm 30cm from wall, stands	90dB/W 40Hz	R	46

* rating refers to original, tested model.

TO ORDER BACK ISSUES OF
HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

CASSETTE DECKS

The bad odour of copyright theft hangs around the compact cassette, but there is no doubt it is the world's most versatile and ubiquitous music storage medium. Hi-fi buffs may wrinkle their noses pointedly, but are still happy to use cassette decks to make up tapes for the car or personal – at the same time complaining loudly about the quality of pre-recorded material. (In fact the very best decks can do a surprisingly good job with musicassettes.)

There is no problem in connecting a cassette deck to any normal amplifier, but some care needs

to be taken in choosing the best tapes for a specific machine. (Trial and error is one effective technique, but many decks have manual bias adjustment and some match up to the tape automatically.) Lab performance and sound quality often go hand in hand, and are frequently somewhat dependent upon factory alignment. The mechanical integrity of the mechanism itself is another crucial factor, that is often reflected in the asking price.

All modern hi-fi decks have Dolby B and the majority have Dolby C besides, the very worthwhile

HX Pro system is becoming steadily more widespread. Remote control remains rare, though sometimes it is available as a system option. Three-head recorders allow simultaneous checking of the recording being made. Auto-reverse is a useful convenience feature, but usually with some mechanical compromise, while double-mechanism 'dubbing' decks of dubious quality are fashionable at the bottom end of the market. The welter of different 'music search' systems available is some indication of their frequent ineffectiveness.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research RD-06 £280	Average Average+	Acceptable middle market player with very simple facilities and cramped control section, but unusually good looks	Dolby B/C HX Pro, fine bias, counter memory, repeat		69
Aiwa AD-F270 £90	Average Average+	An excellent budget machine, adequately equipped and satisfactorily built. Sound quality is in severe danger of transcending the price category	Dolby B/C, fine bias adjust	BB	75
Aiwa AD-F370 £130	Average Average	Adequate but uninspiring recorder with detail shortcomings but good control layout and successful sounding with recorded musicassettes	Dolby B, C, HX Pro, bias adjust		63
Aiwa AD-R470 £150	Average Good	For once, an auto-reverse deck with the performance of a decent unidirectional one at a similar price. The Aiwa is modern in concept and execution, and has good, transparent electronics	Dolby B/C/HX Pro, auto reverse, cue & review, bias adjust	BB	69
Aiwa AD-WX777 £179	Very Good Very Good	Excellent, middle price dual deck with quick side change and a living, breathing sound – though prerecorded tapes sound bright	Twin auto-reverse, one records. Dolby B/C, fine bias	BB	75
Aiwa AD-F700 £199	Good Average-	Somewhat less than the sum of the (most fine) individual parts, this deck has an artificial quality which spoiled the efforts of a fine transport	Dolby B/C/HX Pro, fine bias, CD Direct input		75
Aiwa AD-F800 £249	Good Very Good	Close to first class performance – and superb value. The Aiwa is purposeful and finely engineered. It provides a near irresistible blend of good mechanics and electronics	3 head, dual capstan, Dolby B/C/HX Pro, tape calibration	BB	75
Aiwa AD-WX888 £249	Good Good	Inaccurate set-up spoils metal tape operation, but with other tapes the deck works well. This deck offers fine engineering, facilities and sound	Dual auto-reverse twin deck, Dolby B, C and HX Pro	R	75
Aiwa XK-007 Excelia £400	Good Good	Downmarket version of XK-009 with simplified bias/equalisation adjustment section and more forgiving but less informative sound. Still good, but less exciting than XK-009	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment		63
Aiwa AD-WX909 £400	Good Good	Convenience meets sound quality, and both win. An essentially clean, positive recorder which works alongside an auto-reverse player of lower standard – a sensible compromise	Dual deck, auto-reverse, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57
Aiwa XK-009 Excelia £550	Very Good Very Good	Excellent detail, stable articulate midband and slightly obvious treble. The most interesting Aiwa for yonks	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment, CD direct	R	63
Akai GX-32 £170	Average Poor	Constrained and smeared sum this deck well. It has poor bass and treble definition alike, though it proved well aligned for prerecorded cassettes	Dolby B/C, variable bias, headphone out, track search		69
Akai GX-52 £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-6 £330	Good Good	There is a strong sense that someone has really thought this one through; it has an indefinable 'specialness'	Real-time counter, track search, Dolby B, C, bias adjust	R	52
Akai GX-95 £400	Good Very Good	Well designed and finished cassette deck with features well judged to please the audiophile – especially switchable Dolby HX Pro and switchable panel display. The calibration system is simple and effective, and the deck sounds great	Dolby B/C/HX Pro, 3 head, manual tape set-up	R	69
Denon DRM-500 £170	Good Very Good	Powerful, refined and detailed sound, and an excellent transport are keys to the success of this cleanly styled addition to the range – but why no timer standby?	Dolby B/C/HX Pro, variable bias	BB	75
Denon DRW-750 £229	Good Good	Polished and articulate, the only significant shortcoming is poor performance with prerecorded material	Dolby B/C/HX Pro, twin unidirectional, one records	R	69
Denon DRM-800 £299	Good Very Good	There are some niggling faults and limitations (no timer standby is particularly annoying), but as a means of recording music it sets a very high standard	Dolby B/C/HX Pro, off tape monitoring, dual capstan	R	75
Denon DR-M34HR £320	Very Good Good+	Prerecorded cassettes sounded grey and dull, but this may have been a sample fault. As a recorder, the DR-M34 is refined and detailed – and good value	Dolby B, C, HX Pro, 3 Head, manual tape calibration, memory counter		63
Goodmans GSW-5200 £90	Poor Poor	Musically unimpressive but at least it's cheap!	Dolby B, twin, one records		69
Grundig Fine Arts CCT-903 n/a (system component)	Good Good-	[Competent part of complete Grundig system]. Solid and well engineered deck with small but significant problems preventing it scoring highly. Basic design generally – and transport specifically – are excellent	Dolby B/C, twin auto reverse, one records		69
Harman Kardon CD491 £695	Good Good+	Excellent audio engineering and tremendous flexibility make this an audiophile cassette deck 'with excellence'	Real-time counter, auto reverse, track search, Dolby B, C, HX Pro, bias adjust	R	52
Kenwood KX-440HX £130	Average+ Poor.	Uneven, unstable sounding player with limited resolving power, but good control layout and finish	Dolby B, C, HX Pro, intro scan		63
Kenwood KX-3010 £170	Average+ Average	Minor ergonomic shortcomings notwithstanding, this is a workmanlike deck that only misses recommendation due to an azimuth problem leading to very dull sound with prerecorded tapes.	Dolby B, C, HX Pro, auto bias		75
Kenwood KX-5010 £270	Very Good Excellent	This important new middle price deck is a well thought through and thoroughly developed design which eschews gimmicks for the sake of musical excellence	Dolby B/C/HX Pro, auto tape calibration, track/intro search	BB	69
Kenwood KX-9010 £400	Very Good Average+	Clean, detailed but flat and overtly hi-fi-ish sound quality makes the 9010 a little less than the sum of its parts.	3-head, auto tape calibration, Dolby B/C/HX Pro, remote control		75
Marantz CP230 £300	Average Average	This is a competitively priced portable recorder though not suited to replay of musicassettes	Dolby B, bias adjust	R	52
Marantz SD585 £300	Average Average-	Sound quality is a little sat upon, and control ergonomics are somewhat opaque, though the twin auto-reverse/recording capability makes this a powerful machine	Dolby B/C, twin auto-reverse & record, parallel recording etc		69
Memorex SCT-84 £200	Average+ Average+	The playback only transport is a little disappointing, but the record one is a quality item and the deck works well. Ergonomics are good, but styling and control feel are decidedly tacky.	Dolby B/C, fine bias, twin with auto-reverse record, unidirectional play	R	69
NAD 6300 £550	Very Good Very Good	Solid and homogeneous sound quality and very good replay compatibility thanks to 'play trim'. Distinctive, musical – and costly	Dolby B, C, HX Pro, 3 Head, bias adjust	R	63
Nakamichi CR-1E £345	Very Good Good	Modestly equipped by any standards, the CR-1E stands or falls by its build quality, which is high, and sound which is highly competent	Dolby B & C		57
Nakamichi CR-2E £395	Very Good Good+	Ordinary to look at, in some respects rather awkward to use (tape switching especially), the CR-2E sounds very slightly better than the CR-1E, and therefore ranks well. But it doesn't come cheap	Dolby B & C, bias adjust, remote control	R	57
Nakamichi RX-202E £545	Good Very Good+	Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control system	Auto reverse, Dolby B, C, 2 Head	R	63
Nakamichi CR-3E £595	Very Good Very Good	The user interface is a little clumsy, though conceptually straightforward. Sound quality approaches the CR-4E, and is amongst the best at the price.	Dolby B & C, bias adjust, remote control	R	57

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Nakamichi CR-4E £745	Very Good+ Very Good+	High class deck with a reasonably full range of features and superb sound at a slightly unlikely price	Dolby B & C, bias adjust, remote control, 3 Head	R	57
Nakamichi CR-5E £995	Excellent Excellent	A slightly simplified version of the all-conquering CR-7, the CR-5 has a very similar standard of audio performance – the best	Dolby B/C, fine bias, 3-head	R	69
Nakamichi CR-7E £1500	Excellent Excellent	Remarkably this deck is not only ergonomically but also sonically superior to the Dragon, particularly on record/replay	Real-time counter, track search, Dolby B & C, tape alignment adjust, bias adjust, remote control, 3 Head	R	60
Nakamichi Dragon £1750	Excellent Excellent	Previous to the birth of the CR-7E, this machine stood head and shoulders above the rest. It is still the ultimate for musicassette replay	Auto reverse, Dolby B & C, tape alignment adjust, bias adjust, remote		60
Onkyo TA-2120 £130	Average+ Good	Clear, vivid sound with good timing and resolution when using Type II tapes without Dolby. The controls are less inspiring – the meters in particular are plainly inadequate	Dolby B/C, auto tape sensing, block/side repeat	R	63
Onkyo TA 2130 £160	Average+ Average+	Rating fairly well on both pre-recorded and record/playback, ergonomics were a little poor but overall performance was generally consistent	Track search, Dolby B & C, bias adjust		52
Philips FC566 £179	Average+ Average+	Mostly well equipped, though some tape search facilities fail to exploit the auto-reverse capability. Sounds clean and stable – with prerecorded tapes too	Auto reverse, track search, Dolby B & C		57
Philips FC567 £279	Average Poor	Well equipped but ergonomically substandard; sound quality is messy and lacking in clarity and dynamics	Dual deck, auto reverse, track search, Dolby B & C		57
Pioneer CT-656 £250	Good Good	Well conceived and executed low cost 3-head recorder. It benefits from and makes good use of metal tapes, but is never less than couth and stable sounding – even with ferric tapes	3 heads, off tape monitoring, fine bias, Dolby B/C/HX Pro	R	75
Pioneer CT-737 Mk II £350	Good Average+	Easy to use and sensibly equipped, the CT-737 is much improved, but sound quality is still a tad lacklustre	3-head, Dolby B/C/HX Pro, manual record bias/sensitivity		75
Pioneer CT-91a £500	Very Good+ Very Good+	Superb, near state of the art recorder with an excellent dual capstan transport and very capable electronics. At the price, this one is a mould breaker	3-head, tape calibration, Dolby B/C/HX Pro	R	75
Revox B215-S £1,826	Very Good Very Good+	This is a superbly engineered deck with a classically fine performance that almost transcends the stereotypes. Ergonomics are flawed but the user interface is both powerful and flexible	3-head, dual capstan, Dolby B/C/HX Pro, auto calibration	R	75
Rotel RD-865 £200	Good Very Good	Fine, architecturally solid sound quality in a package with a low gimmick count and strong audiophile appeal	Dolby B/C/HX Pro, fine bias	BB	75
SAE C102 £549	Average+ Good	Looking most unlike a cassette deck designed in the States and proving competitive in its price group. Not sonically that outstanding, however	Real-time counter, track search, Dolby B & C		52
Sansui D-X301i £180	Average+ Good	Lively, informative and well equipped basic deck, if rather obscure operationally	Dolby B/C/HX Pro, variable bias, track search	R	69
Sony TC-FX110B £90	Poor+ Poor+	Woolly bass and scrappy treble combine to make a meal of many music types, despite accurate response shapes with most types of tape. Prerecorded material sounds dull	Dolby B/C		75
Sony TC-TX55 £150	Average Average+	The sound quality ranking is a good one for an auto reverse machine at this price level. Clean, sharp sound, only slightly let down in the deep bass.	Auto reverse, Dolby B, C & HX Pro	R	75
Sony (WMD6C) ProWalkman £249	Good+ Very Good	"One of the finest sounding cassette decks on the market today. A mandatory Best Buy, which also fits in your pocket"	Dolby B, & C	BB	60
Sony TC-RX60ES £250	Average Average	For once a stable sounding auto-reverse deck but sound quality is rather 'dirty' and compressed, especially with Dolby C	Auto-reverse, Dolby B/C/HX Pro, auto tape recognition		63
Sony TC-RX80ES £350	Average+ Good	Clean, powerful and detailed sound, especially without Dolby C. Stable pitch – but prerecorded cassettes sounded disappointing	Auto reverse, Dolby B/C/HX Pro, bias/level adjust	R	63
Teac V-270C £89	Average- Average-	Not quite cheap enough to compete solely on price, the V-270C is a rather messy and unstable sounding deck	Dolby B & C, bias adjust		63
Teac V-480 £129	Average Average+	A rather utilitarian model, the V-480 just makes it on to our recommended list by virtue of a clean, open sound that to an extent transcends the measurements	Dolby B/C/HX Pro, fine bias	R	75
Teac W-470 £129	Average- Average	A low grade transport is allied to respectable electronics to give sound quality ranging between acceptable and good. Prerecorded tapes sound bright	Twin deck, one records, Dolby B/C, intro-search		75
Teac V-870 £349	Good+ Good	Cut-down V-970X for the proletariat. Expensive and carefully engineered with mostly very good but slightly cold sound quality	Dolby B, C, HX Pro, 3 Head, manual tape calibration	R	63
Teac V-970X £449	Very Good Very Good	An excellent sounding deck with useful features (tape calibration etc) that fully justifies the price	Real-time counter, track search, Dolby B/C/dbx & Dolby HX Pro, bias adjust, remote control, 3 Head	R	57
Teac W-990RX £445	Good Good	A mess with dbx, but taut and articulate otherwise. The 990, though expensive, has a powerful range of features, making it one of the few really ambitious decks to successfully straddle both sets of requirements	Dolby B/C & dbx, dual auto-reverse/record, parallel & sequential recording, remote	R	69
Teac R-919X £489	Very Good Average	Superbly equipped, yet usable – and well built too. But sound quality is something of a disappointment at this price level, being appropriate for a model about half the price	3-head auto-reverse, tape calibration, Dolby B/C/HX Pro/dbx		75
Technics RS-TR255 £160	Average Average	Neat, sensibly designed middle of the road dual transport recorder, suitable where the ability to dub tapes is a particular priority	Twin transports, one records and auto-reverse, Dolby B/C	R	75
Technics RS-TR355 £200	Average Average	Serviceable middle market dual deck without serious fault but with some annoying inadequacies, notably an inability to play side A and B and then stop	Twin auto-reverse, one records, Dolby B/C/HX Pro		75
Technics RS-B905 £350	Good Good	Good, well set up cassette deck with a clean, accurate sound but some compression. dbx circuit sounds poor	Dolby B, C, HX Pro, dbx, bias adjust, 3 Head		57
Yamaha KX-230 £140	Average+ Average+	A strong near-budget performer, the strengths include good overall sound, excellent search aids. Weaknesses: ergonomics, soggy bass with prerecorded material	Dolby B/C/HX Pro, variable bias	R	75
Yamaha KX-300 £160	Average+ Average-	Uncommonly well equipped and adequately made and presented, this model turned out to be a disappointingly uncertain proposition on audition	Track search, Dolby B, C, HX Pro with 'play trim', bias adjust, remote control		57
Yamaha KX-500 £210	Very Good Very Good	An accomplished performer, strongest in the areas of pitch and spatial stability, but slightly rough around the edges	Real-time counter, track-search, Dolby B/C/HX Pro with play trim, bias adjust, remote control	R	57
Yamaha KX-800 £330	Good Average	The present Yamaha range seems oddly inconsistent. This sophisticated model sounds fine (almost) but came a clear second best to the KX-500	Real-time counter, track search, Dolby B, C, HX Pro with play trim, bias adjust, 3 Head		57
Yamaha KX-1200 £500	Excellent Average+	A veritable rats' nest of buttons and dials, albeit well laid-out. This is nearly a great recorder, but lacks simplicity of sound	Real-time counter, track search, Dolby B, C, dbx, HX Pro, bias adjust, remote control		52

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

DAT RECORDERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa Excelia XD-001 £1300	Very Good Very Good	Clear and very listenable recorder roughly comparable to but slightly sweeter sounding than the Sony DCT-1000ES – but with an inferior front panel design	Track ID and search, remote	R	63
Grundig Fine Arts DAT-9000 n/a (system component)	Good Good	Conventional DAT recorder offering standard facilities. The deck is well made and equipped, and is engineered to a satisfactory quality standard. It performs to an acceptable standard, though it is not state of the art	2/4 hour recording, mic inputs, digital in/out		69
Luxman KD-117 £1499	Good Good	Slightly soggy, earth-bound sound quality, this model trails the other DAT decks tested so far	Two analogue inputs, remote twin address		63
Sony DTC-M100 £799	Very Good Very Good	Clean, clear sounding 2nd generation model with most of the features and sound of the DTC-1000ES	Midi-width, alpha-numeric display, remote, optical interfaces	R	63
Sony DTC-1000ES £1299	Very Good Very Good	Fine, consistent performer with accomplished tape handling and good build quality	Standard track ID and search, remote	R	63

CD PLAYERS

This all-digital music source is well established, despite still high disc prices and the opposition of many hi-fi enthusiasts. Compact Disc's strengths over conventional vinyl are complete freedom from surface noise with automatic and programmable play, plus track skip and fast music scan – frequently under full remote control. However, many vinyl enthusiasts find CDs sound less involving than

top quality vinyl replay.

Introduced five years ago at around £500, CD players now average less than half that price, and for the main offer improved performance besides. Even cheaper players may have the latest decoding chips and the most useful play features; extra money can buy remote control, remote volume control, audio 'tweaks', plus improved build and component

quality control.

Compared with many hi-fi components, CD players give impressive lab performance, though there are differences between players nonetheless. Sound quality variations are even more marked, particularly in a good quality system. As it behaves very like a preamp, there are no problems connecting a player to a normal amplifier.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
ADC CD 2000E £330	Good+ Fair+	One of the slimmest players in the business but nothing special inside. Nice ergonomics but overpriced	Remote, timeshared 16 bit		64
Aiwa DX-M45 £149	Fair Fair	Outdown Philips technology, but results are quite good for this British made machine	Manual	R	64
Aiwa XC-005 £280	Average Average+	Very comprehensively equipped including double digital and audio outputs. The average performance was still sufficient for recommendation at this price	Power vol, edit-dubbing, shuffle 2 digital op	R	76
Aiwa CD-001 £300	Good Good	Pretty close to Recommendation, delivering a respectable sound quality and lab performance from an ergonomically attractive package, but ultimately failed to excel in any particular respect.	Track entry/volume remote, direct recorder connection etc.		58
Aiwa XC-007 £499	Very Good Good	Creditable sound despite inverted output, high tech engineering with very good lab performance. A worthy contender but not cheap	Remote, keypad, timer, digital output, pseudo 20 bit, dual DAC		64
Akai CD-52 £249	Good Good	A nice surprise from Akai, genuinely good sound from this mid-priced model. Better linearity will help further	Remote, digital output, headphone socket	BB	64
Akai CD-62 £330	Fair Very Good	Looks, build quality and the technical specification are right up to date. As it stands it sounds very good but if the indifferent lab performance could be improved, it would probably sound even better.	Remote, programme, hdp, comprehensive display etc	BB	70
Akai CD-73 £450	Good Average	A little uneven musically, the Akai tends to smother fine detail, but has first class dynamics and stereo imagery. Worth auditioning	Track entry keypad remote, menu display (switchable)		62
Akai CD93 £700	Good Very Good	Undoubtedly a CD player of real class in build, presentation, lab performance and sound quality, but also a shade expensive for formal Recommendation – though that's not to dissuade lovers of black lacquer wood finish.	Track entry remote, menu display etc.		58
Arcam Delta Black Box £250	n/a Very Good	This rich, powerful and articulate sounding DAC transforms the majority of medium price CD players	Needs D-out CD players	R	60
Arcam Black Box II £299	Very Good Very Good	An addition to the BB I, it also offers improved sound and more inputs	Optical and wired input digital decoder	BB	76
Arcam Delta 70 II £550	Very Good Good	Now in Mk II form a further improvement is seen in features, performance and sound quality. Solidly built and British	Now adds simple remote vol + std features; also display off	R	76
Arcam Delta 170 Transport £599	Very Good Very Good	While no bargain, this is a well made metal boxed transport providing clean digital data for outboard decoder/processors	Transport only, display off, usual programming	R	76
Cambridge Audio CD2 £650	Fair Very Good	The finest midrange in digital audio is sufficient grounds for Recommendation, though there remains a tinge of disappointment that the CD2 didn't get closer to big brother elsewhere, notably in the bass.	16x oversampling, remote control	R	58
Carver TL 3100 £340	Average Average-	The sound quality did not live up to the excellent fascia. Carver's DTL did not aid the indifferent sound	DTL sound shaping, usual facilities, remote, memory		76
conrad johnson DFI £1,995	Average- Good+	Setting a decent standard and including an FET line preamplifier, the unusual DFI is worth investigating	Line preamp built-in, simple remote facilities		76
dbx DX5 £640	Good Poor	Sound quality proved a single disappointment, though it's refreshingly unique in providing semi-pro post-production facilities that some users will undoubtedly relish.	Track entry/volume remote, compression, impact recovery, ambience etc.		58
Denon DCD 610 £200	Good+ Fair+	Lots of Denon player for the money, well equipped with good all round performance	Remote, versatile programming 2x 0/S	BB	64
Denon DCD820 £249	Average+ Average-	A powerful combination of features and build for the money ensures recommendation. The sound is just good enough	Well equipped, power vol, edit etc, digital out	R	76
Denon DCD 810 £250	Very Good Fair+	A good value allrounder bettered on sheet value by the 610 and 910; power volume could sound better	Remote, 4x oversampling, programming	R	64
Denon DCD 910 £300	Very Good Fair+	A well equipped deck of impressive appearance and solid sonic and lab performance	Remote volume, programming, 8x 0/S digital output	BB	64
Denon DCD1420 £400	Very Good Average	Superbly equipped with a fine lab performance, this modern player needs a touch more sonic spice to be recommended	20-bit, very comprehensive, remote, power volume etc		76
Denon DCD-1500II £500	Very Good Very Good	The extra build quality over cheaper Denons is justified in terms of sound quality and lab performance, while the feature list is comprehensive and quite nicely presented.	Track entry/volume remote, menu display etc.	R	60
Denon DCD-1520 £500	Very Good Very Good	High tech, high profile, high gadget content, good sounding player at an almost affordable price.	Programme, hdp socket, remote, track entry, optical digital output	R	70
Denon DCD 1700 £650	Good+ Very Good	The overall sound was strong and coherent approaching reference standards. Fine build quality and facilities make this a firm contender	Remote, skip, scan, headphone socket, programmable	R	58
Denon DCD 3520 £1000	Very Good Good+	Built like a battleship this new model takes its place at the top of the Denon range with a smooth and powerful sound, quite free of graininess	Composite 20-bit DACs, full programming features	R	72

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Denon DCD-3300 £1200	Good ++ Very Good	Sounding tight and coherent though not significantly better than the cheaper 1700. Very well built and comprehensively equipped	Remote control, with volume, keypad programme, scan, search, headphone		51
Dual CD 1030 RC £170	Fair Fair	An up and down performance on test but it is hard to deny the overall value for a machine that includes remote control at this price	Remote, headphone socket, 2x 0/S, timeshared 16 bit	R	64
Ferguson CD007 £130	Good Fair	The cheapest recommendation in the test group; don't expect the earth but the value is good	Manual, digital output, headphone socket	R	64
Ferguson CD008 £150	Fair Fair	Not as strong as its relatives, sample fault perhaps? Though performance is fair enough overall	Remote, midi digital output, 2x 0/S, timeshare 16 bit		64
Goodmans GCD300 £129	Average Average	It may be adequately made, but with cheap good sounding players available this particular Goodmans isn't quite good enough	Programmable, skip, search, repeat		70
Goodmans GCD550 £199	Average+ Fair +	A slow autochanger with a weakish lab performance but the sound is fair enough, the features good and the price is low	Remote, 6 disc autochanger, 2x 0/S	BB	64
Goodmans GCD555 £219	Average Average-	Scores approval on grounds of low price. You must pay more for better sound and a faster mechanism	6 disc changer, 32 track memory, remote etc	R	76
Grundig CD9000 £1000	Good Good	Aimed at a market which puts external styling above sound quality. Although this player is of slightly above average competence in most departments it is expensive	Remote, programme, hdph socket, calendar display etc		70
JVC XL-21010 £499	Good Average-	Despite some high tech design and a good lab result this model did not deliver good sound quality	32 track prog., disp off, auto fade, 2 digital		76
Kenwood DP-8010 £449	Good Fair	Top build quality and novel technological features seem to achieve little success here. While the technical performance is fine, the sound quality doesn't match its competitors	Track entry remote, memory display, sprung feet, optical digital output etc		70
Luxman D-90 £300	Fair Good	Despite technical ingredients that do not seem particularly inspiring, this is a nicely judged package that is ergonomically neater than most, with decent sound quality for the price and distinctive finish and presentation.	Track entry remote, programming etc.	R	58
Marantz CD583 £169	Very Good Good	Devoid of all but the CD essentials it makes up for in sound quality what it lacks elsewhere	Memory, track skip, search, etc	BB	70
Marantz CD85 £500	Very Good Very Good	This player may just miss a top sonic rating but it's well made and has plenty of features befitting a Marantz heavyweight	FTS, key pad remote, comprehensive display, programming, optical output etc	R	70
Marantz CD94/CDA94 £1600	Very Good Very Good +	This two-box combination delivers reference standard lab and listening test results, albeit at a price which seems a little steep. Very refined	Favourite track selection, remote, balanced output etc	R	60
Marantz CD12LE £2800	Very Good Excellent	This top of the range two-box player may be very expensive but it is very well made. Technical performance is very good and the sound is the best from Marantz yet	Two box, digital processor, FTS, optical connection, hdph socket, comprehensive display, balanced output etc	R	70
Meridian CD207 £1050	Very Good Excellent	The 207 matures with age and in its present form it offers one of the best sounds around plus great packaging and versatility through its preamp options	On-board preamp, options, two box, coax digital output, remote	R	72
Micromega CDF1 Classic £1400	n/a Very Good	A very well made and stylish player from France, the CDF1 is a CD player for analogue lovers or as close as we've come across	Basic remote, digital output, suspended chassis	R	72
Micro Seiki CDM100 £3850	Very Good Good	One of the hernia inducing bricks of hi-fi, the Micro is extravagantly styled, finished and built. The good lab performance led to an 'only good' sonic display when the price demanded excellent	Balanced output, remote, display blanking		72
Mission PCM2 £500	Good+ Good	A matured design with good features it is the best sounding power volume player available, it even tests well. It accepts the £200 PSX power supply option	Remote volume, display and phase invert	R	64
NAD 5320 £169	Average- Average-	A low cost player devoid of features but at this low price it should still offer better sound	Budget facilities, 20 track program		76
NAD 5220 £230	Average- Poor	Conforms sonically to a stereotype of the medium that most players have grown out of. Hard, thin and raw sound with poor stereo and resolution.	Time/track display, memory		62
Nakamichi OMS-1E £395	Good Good	This neat enough player doesn't really follow the Nakamichi tradition of providing exceptional sound quality while at the same time perpetuates that of selling at an above average price	Simple remote etc.		58
Nakamichi CDP-2E £495	Very Good Good	It's ergonomically superior and has above average sound, but it isn't cheap. The standard of build quality and finish is first class which isn't quite matched by the sound quality	Programming, hdph, remote track entry, digital output		70
Nakamichi OMS-4E £1200	Very Good Very Good	Solidly controlled and comparatively simple this clearly represents one of the major benchmarks for CD sound quality, though the midrange sounded a touch thin	Skip and scan, headphone socket		51
Nakamichi OMS-5EII £1500	Good+ Very Good	"... delivers near state of the art performance and build quality in a deliberately starkly functional package, but at a very high price..."	Skip and scan, simple track programming, manual control		51
Nakamichi OMS-7EII £2000	Good+ Good	The only serious criticism here is of the price. And in our not always humble opinion you can get better sound quality for less elsewhere in Nakamichi's range	10 digit track entry keypad programming, headphones		51
Onkyo DX-1500 £170	Average Fair	Ruled out on the grounds of its poor DAC filter, but it's not so bad really given the price	Manual, 2x 0/S, timeshared 16 bit		64
Onkyo DX-3500 £250	Very Good Fair	It offers a lot of facilities and fine build quality for the money. Lab performance is very good but the sound quality doesn't inspire	Key pad remote, memory, hdph socket, comprehensive display etc		70
Onkyo DX-7500 £450	Good Very Good	This comes close to the state of the art performance in many areas. It has lots of facilities and is well made too.	Key pad remote, memory, hdph, very comprehensive display, optical digital output etc	R	70
Philips CD610 £160	Average+ Average	Built down to the price the sound is OK while the package performance and features constitute fine value	Remote, hdph, programming etc	BB	76
Philips CDC875 £300	Average+ Average-	The changer works well and this machine is very well equipped. The sound quality is below par but may not matter too much in its likely 'muzak' application	6 disc changer/dig op remote, hdph, memory, shuffle		76
Philips CDV185 £350	Average+ Average	Hard to value with the video singles facility but it all works well enough for a recommendation	Video singles + CD scart + digital out etc	R	76
Philips CD880 £500	Very Good Very Good	The '880 is an impressive blend of luxury build quality and features at a far from extravagant price, and also delivers the subjective goods.	Volume remote, FTS, menu display etc.	R	60
Pioneer PDM710 £350	Good Average	A fine multi-changer with excellent memory programming; fully featured, sounds fine but no digital output	6 disc changer, 40 track memory + multi memory full remote, hdph, etc	R	76
Pioneer PD9300 £450	Excellent Average	A mid price flagship of excellent build and lab performance but only average sound - interesting though	Remote, 24 track programming, 2 digital op		76
Pioneer PD-91 £800	Excellent Very Good+	Close to state of the art in nearly all areas - soundstaging, clarity and simple lack of artificiality. A well made and sophisticated player	Track entry remote, calendar display, index search, etc.	R	64
Proton AC-120 £180	Average Average-	Fine styling, low price but barely average performance	15 track memory, simple design, remote, hdph		76
Revox B126 £649	Very Good Good	Made in Switzerland so the build quality and technical performance is high but then so is the price and the sound quality is only good	Programming, Revox remote system compatible		70
Revox B226S £840	Good Average	Top quality build and finish for the Revox system enthusiast. For high value sound look elsewhere	Remote vol, hdph, 19 track memory, digital op		76

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Rotel RCD820B £210	Good+ Fair+	A budget Philips based player of dependable sound quality and offering very good value. Build is a touch lightweight	Remote, basic facilities	BB	64
Rotel RCD820BX2 £250	Good Very Good	Start with a good base and then make it sound better, the '820BX2 CD player maintains the reputation established by its namesake, and comfortably deserves Recommendation.	Direct track entry remote etc.	R	58
Rotel RCD855 £250	Good Good+	Stripped for action this well built Philips technology player delivers fine performance and sound. First rate value	Remote, 20 track prog, 1 audio op, 1 digital	BB	76
SAE D102 £700	Good Good	Considering the high price of this player, most of the innards seem fairly prosaic. Sound quality and lab performance are both respectable enough, but hardly justify the price premium involved, though styling is unusual.	Remote (inc volume), skip, scan etc.		58
Sharp DX150 £129	Fair Fair	This is a none oversampled player which is rather outclassed for technical and sonic merit by the vast majority of the competition. Pretty enough but would you want to put discs in it?	Programmable, skip, search, repeat		70
Sharp DX750 £179	Fair Fair	It has a remote control but it's too like the 150 which is rather outclassed for technical and sonic merit by the vast majority of the competition	Remote, programmable, skip, search, repeat		70
Shure Ultra D6000 £495	Average+ Fair	Ergonomically well thought out with full function remote control, but not really scoring sonically considering its price	Remote control (full function inc volume)		51
Sonographe S01 (by CJ) £799	Good Very Good	Distinctive with oak end-cheeks, using Philips based 14 bit x 4 oversampling, Conrad Johnson electronics make this a musically rewarding player	Full search programme and timing	R	51/Coll
Sony CDP-M55 £190	Fair Fair	£20 buys a remote control handset to operate your M35. Sony call it an M55 (see CDP-M35 review).	Simple remote, skip, scan, programming etc.	R	58
Sony CDP-M75 £230	Good Good	This midi version of the '750 saves £20 on the price (see CDP-750 review).	Track entry remote, menu display ect.	BB	58
Sony CDP-C50M £250	Fair Fair	The Sony concept of an autochanger is interesting and executed with characteristic thoroughness. The lab and sound test results reveal it to be of only average quality	Carousel autochanger, remote, multi disc programming, variable hdph socket		70
Sony CDP-M95 £280	Very Good Fair+	Very well equipped mid sized player fine build and finish, incorporating Sony's custom file disc labelling	Remote, programmable, variable hdph output	R	64
Sony CDP-228ESD £400	Very Good Average+	Good value, this is Sony's best mid price design and comes superbly equipped	hdph, remote, rem vol, custom file	R	76
Sony CDP-338ESD £550	Excellent Good	Only a bit better than the 228 the 338 is a good machine, but not quite good enough for formal recommendation at its price	Custom file, remote, rem vol, hdph, shuffle etc., 2 digital		76
Sony 557ESD £1000	Excellent Good+	Superbly built flagship model that produced excellent lab results and very good sound. Many luxury features though not that good value	Full remote, disc directory, digital output, power volume, 8x 0/S, 18 bit		64
Sony CDP-X7ESD £1300	Good+ Average	A Sony flagship, build and finish is exemplary, styling is unusual but the sound is just average	Custom file, remote, 2 digital op, balanced audio + phonos		76
Sony CDP-R1/DAS-R1 £5000	Very Good Excellent	Sony has aimed high with the R1 and in some ways has created the reference player. Build quality is amazing and it offers a high level of facilities. One or two faults were revealed in both the lab and the listening, but it's generally excellent	Two box, dual optical connection, digital processor, FTS, remote		72
Stax Quattro £2995	Very Good Very Good	Now in mkII guise this substantial player recreated exceptionally strong and convincing bass lines together with a beguilingly musical midband	18-bit DACs, 20-track memory, full IR remote, variable o/p	R	72
Teac PD470LE £279	Average Average	With the LE upgrade the 470 has improved to a just average position	Remote, hdph, 20 track prog		76
Teac ZD880 £450	Good Fair	Decent enough in most respects with a very good build and finish. Its sound isn't competitive enough to inspire any real enthusiasm	Remote, track key access, auto space, comprehensive display, hdph socket etc		70
Technics SLP202 £160	Very Good Average-	A competent budget player; no frills but a good value performance and build quality. Buy the similar SLP227 if you want remote control	Simple facilities, 20 track program, no rem	BB	76
Technics SLP-333 £270	Good+ Average	A decent enough player lacking that final edge necessary for review distinction	Dubbing edit, hdph, digital out, rem vol remote, 20 track prog		76
Technics SLP-555 £320	Very Good Average	A well balanced, well made player delivered at a very fair price. Good facilities for cassette dubbing	Peak level detection, remote, rem vol, hdph digital op	R	76
Technics SLP777 £380	Very Good Average	A higher quality version of the 555, it may impress with its extra facilities. Performance is similar to 555	Display off, full remote, audio level meter, 32 track prog, hdph digital op		76

CD MIDI SYSTEMS

So you want a hi-fi, but you don't want to make a fuss about it. A pre-packaged system with everything matching up and no aggravation may not rank with carefully chosen separates on **sound quality**, but there's no denying the attractiveness or popularity of this approach - the market for pre-packaged component hi-fi systems is at least as big as that for separate items, even ignoring the vast numbers of low-cost single unit stacker systems.

The arrival of compact disc led to a new fashion for shelf-standing compact systems, or 'midis' as

they are known in the trade, as a replacement for earlier floor-standing rack systems (themselves the upmarket development from music centres). Only some 330mm wide, midis can more or less match full-size (430mm) rack components for performance, and are certainly cheaper to make, ship, sell and buy.

Whereas specialist hi-fi is moving steadily towards ultra-simple 'no frills' components, midi systems tend to be sold on a feature count at a price point, usually with little opportunity for

demonstration and comparison. Our test programme includes extensive auditioning and lab testing, while making allowance for the different aspirations of designers and expectations of users. Key features valued highly by customers include system remote control, automatic switching, double 'dubbing' cassette decks, and elaborate equaliser tone controls. And the top end of the market is developing with surround sound audio/video-ready packages.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa X-D80K £550	Poor Poor	Congested and harsh sound quality, the cassette deck, amp and loudspeakers being well below par. The built-in timer adds some operational flexibility	Auto-reverse, CD synchro record, remote, timer		77
Aiwa X-D100 £1000	Average- Fair	Very fully equipped with wide ranging in and outputs but poor upgradeability. Sound quality is reasonable on the whole	Digital & optical in/outputs, dual auto reverse, disc file CD etc		77
Akai M.50CD £550	Poor Poor	Cassette lacks Type II compatibility, general sonics mediocre or less	Devolved from M.80 but simplified, part remote		65
Akai M.80CD £800	Good Good	Good all rounder with minor ergonomic shortcomings but generally practical layout	Separates based, twin auto-reverse cassette	R	65
Ferguson HFD28 £300	Poor Poor	Similar to Goodmans 5000 system but with greater power and marginally superior sound	One-piece, semi-remote		77
Goodmans 5500 £320	Poor Poor	It offers the basic features (but no Dolby or magnetic cartridge) and rough and ready sound	One-piece, remote		77
Goodmans 5300CDM £400	Average- Average+	Crisply styled system with gutsy amplifier and sophisticated speakers. CD player works well, other sources are variously mediocre	Combined cassette/tuner/amp, plus T/T and CD with remote	R	65

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

DEALER GUIDE



Hi-Fi Specialists

- A&R
- Castle
- Dual
- Mordaunt-Short
- Musical Fidelity
- Pioneer
- Philips CD
- Sony
- Trio/Kenwood
- Yamaha
- B&W
- Denon
- Marantz
- Monitor Audio
- Nakamichi
- Rotel
- Revox
- Thorens
- Ariston etc.

Two-year guarantee
Private listening room
Excellent comparator demonstrations

54 Chapel St., Chorley, Lancs.

Telephone (02572) 71935

A & R, Creek, B&W, Nakamichi,
Dual, Linn, Meridian, Quad, Cambridge
Audio, Denon, Musical Fidelity,
and many other leading brands.



SINGLE SPEAKER DEM. LOUNGE.

ENTHUSIASTIC DEMONSTRATION WITH PLEASURE.

NICK DAKIN

(HI-FI SPECIALISTS) LTD.

45 Radford Road, Nottingham.

Telephone (0602)783862

AUDIO VENUE

24 CHURCH ROAD, CRYSTAL PALACE, LONDON SE19 2ET
TEL: 01-771 7787

Stockists of: Linn Hi-Fi, Naim Audio, Epos, Creek, Denon, Dual, Revolver, Marantz, BLQ, Yamaha, Nakamichi, Rotel, Audiotec, etc.

2 single speaker demonstration rooms, Instant Credit Facilities.

All equipment delivered & installed. Comprehensive turntable rebuilds etc.

Low Rate Credit. 2 year warranty.



Open 10-6pm - Closed all day Wednesday

MANDERS HI-FI LTD

For Nakamichi, Quad, Dual, Hafler, Luxman, Denon, Revox, Harman-Kardon, A+R, Thorens, QED, Spondor, Monitor Audio, Rotel, Ariston, Revolver, Technics, Musical Fidelity, Wharfedale, Celestion, Meridian, Proton, A.E. Speakers etc.

Two year guarantee on hi-fi

**2 Edward St, Grimsby,
Humberside
0472-351391**

WHAT RUSS ANDREWS CAN DO FOR YOUR CD PLAYER

If you love CD definition, impact, solidity and clarity but want analogue openness, smoothness, reality and involvement as well, you have just found the answer - our accessories will give you exactly that.

● **TORLYTE CD PLATFORM** improves all-round performance but particularly bass definition and imaging

● **KIMBER KABLE INTERCONNECTS** will give sweeter high frequencies, more believable voices and a more spacious, relaxed sound stage.

● **KIMBER KABLE DATA LINKS** for two box players are a revelation in all areas!

● **KIMBER KABLE MAINS CABLE** eliminates that high frequency aggression so common in CD players and seriously improves bass too! Send for full details and prices. We accept credit card telephone orders.

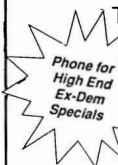
Full money back guarantee if you are not delighted.

RUSS ANDREWS TURNTABLE ACCESSORIES LTD
EDGE BANK HOUSE, SKELSMERGH, KENDAL,
CUMBRIA LA8 9AS TEL: SELSIDE (053 983) 247

COMPACT Music

THE HI-FI SPECIALISTS

Acoustic Energy, Alexander, Audion, Audio Technica, Cambridge Audio, Castle, Deltec, Denon, Dual, Incatech, Kenwood, Kiseki, Kuzma, Nagaoka, Pink Triangle, Proac, QED, Rotel, SD Acoustic, Sennheiser, SME, Systemdek, Tannoy, Target, That's Tape, Wharfedale.



27, MARKET PARADE, HAVANT,
HAMPSHIRE PO9 1PY
Tel: (0705) 473952

OPEN: 10-1, 2-6 CLOSED: MONDAYS

In Concert

Quality HiFi on the Wirral

A wide range of products from the leading manufacturers including: Musical Fidelity, Monitor Audio, Alexander Acoustics, KEF, Tannoy, Denon, Kenwood, Audio Dynamics, QED, Shan Acoustics, Spica, Dual, Systemdek, Target Audio, Audio Dimensions, Nagaoka, Audio Technica, Ortofonand a wide range of accessories

Demonstrations in our listening room or at home

144 Seaview Road, Wallasey, Wirral, Merseyside L45 4PE - Tel 051 630 5055
Opening times: Tuesday/Wednesday/Saturday 10.00-6.00, Thursday/Friday 10.00-8.00
Lunch 12.30-1.30, Closed all day Monday

BUY, SELL, EXCHANGE & REPAIR CENTRE FOR TV, VIDEO & HI-FI

- * NEW & RECONDITIONED EQUIPMENT
- * FULLY GUARANTEED
- * COMPETITIVE PRICES
- * TECHNICAL ADVICE GIVEN
- * EXPORT ORDERS WELCOME
- * FULL BACK UP AND REPAIR SERVICE
- * FOR PERSONAL & PROFESSIONAL SERVICE



CANAL BRIDGE AUDIO VISUAL

172 Caledonian Road, London N1 0SG



01-837-8741



THE DIRECTORY

CD MIDI SYSTEMS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Goodmans Maxim-Midi System £520	Average Average+	De-luxe version of 5200 system – very good value for money and readily upgradeable. Sonics rough but OK and speakers good; CD crude	All separates with twin cassette	R	54
Grundig Studio Line 1 £330	Poor Average+/ Poor	Intriguing package with warm, woolly but attractive sound let down by poor attention to detail and suspect cassette deck. Amplifier appears to be inadequately protected	CD/cassette tuner plus preset equaliser		77
Hinari DK200 Disc Deck £300	Poor— Poor—	Confused user interface is matched to inadequate electronics. Poor – and poor value	Single unit, two cassettes, CD, tuner, remote		77
JVC Midi-W900CD £1000	Good Good+	A competent allrounder, with important convenience related features, and powerful linked recording facilities. Less strident speakers would be appreciated	Separates system, equaliser, auto-reverse cassette	R	65
JVC Midi-W91CDM £1111	Good— Average	Very well equipped (viz. multi-disc player, powerful tape related features) with acceptable but rather nondescript sound	Multi-disc player, twin auto-reverse cassette, equaliser		77
Marantz MX493AVCD £549 with LD20 speakers, £449 without	Average Mixed	Good source components (ex cassette) let down by poor amplifier. Flexibility is strong point, and the system may prove attractive where the A/V possibilities can be fully utilised	Twin auto reverse, opt speakers, surround processor etc	R (with LD20)	77
Marantz MX583 £750	Average— Poor	The system has potential in an A/V context, but is patently lacking in a purely audio one. Only the CD excels	Component system with A/V amp, no speakers		65
Marantz MX673CD System £900	Average+ Average	Tremendously flexible audio/visual system. Sound quality is satisfactory at best and ergonomics a mess	Various A/V inputs, remote, speakers optional		54
Pioneer S-11 £510	Average— Average—	Fine lower middle market system, with one useful extra – the built in timer. Only the record deck is disappointing	Twin auto reverse cassette, built in timers, one piece amp/cassette		77
Pioneer S-330D £1080	Very Good Good	High standard of reproduction on all sources, though mistracking with Dolby C was a limitation. There are few gimmicks and plenty of fine engineering	Dolby C/HX Pro, multi-disc, amp with DAC etc	R	77
Proton AI-3000 £550	Good Good	There are a host of minor problems, including no LW, but the unit is attractively packaged and can be made to sound very good despite a woolly sounding amplifier	One piece CD, cassette, tuner and amp, remote	R	65
Sanyo 39CD £260	Poor Average—	Acceptably compromised basic low end system, offers broadly respectable if unambitious music making for those on a tight budget	One piece + CD, non-remote, manual tuner		77
Sanyo 49CD £300	Poor Average—	Similar to 39CD, but with Dolby B, preset tuning, remote control and more power. Audio wise, it's more of the same, but there's greater stature when loud and cassettes are helped by Dolby B	One piece + CD, partial remote control, digital tuner	R	77
Sanyo 59CD £380	Average— Average—	Adequate performance overall, though endemic lack of pitch integrity takes edge from tape and records. Some inconsistencies in control system too	As 49CD, + full remote, auto source select, separate turntable		77
Sharp CD-X17E £550	Average Average+	Highly specified miniature with detachable speakers. AC mains power only. Good sound let down by crude upper midband and treble. Expensive for what it is	CD luggable with dual cassette & tuner, detachable speakers		77
Sharp SA-CD800H £700	Average Average—	A superficially high grade, high spec system, the SA-CD800H actually sounds clean but a little 'synthetic'	One-piece, 6-disc CD, no T/T		54
Sony Compact 301CD £400	Average— Average	Mainly crisp, articulate sound and excellent ergonomics offset by modest FM results and lack of pitch integrity on cassette	Twin unidirectional cassette, equaliser, 30 preset tuner etc		77
Sony 501CD £500	Average Average	Fair all round performance except noisy FM. Ergonomics and visuals good, but no auto source select, tuner stereo defeat	Twin auto-reverse, 3-band tuner, equaliser etc	R	77
Sony Compact 500CD £550	Average+ Average+	Impressive visuals are matched to electronics which in audio terms lack inspiration. The speakers are particularly poor	Combined amp/cassette, 36 preset tuner, T/T component CD		65
Sony Compact 700CD £700	Average+ Good	Loudspeakers and (to a lesser extent) turntable spoil a fine sounding and stylish – if rather costly – package	Separates system, auto reverse cassette, 36 preset tuner		65
Sony Compact 701CD/711CD £700/£800	Average+ Good	Sound quality good all round, though cassette pitch accuracy is below par. Features average but system control is weak	Twin auto-reverse, graphic equaliser (711 only), 30 preset tuner	R (701CD)	77
Sony Series 1000CD £1500	Very Good Excellent	Very sharp, articulate sounding system from CD and FM. Cassette deck good and flexible, turntable as usual is not in keeping	Separates system, twin auto-reverse cassette, amp with DAC	R	65
Technics X900CD £470	Average Average—	Good build and mostly good sound is offset by mediocre amplifier and loudspeaker and some operational oddities	Main cassette/tuner/amp, separate T/T and CD		65
Technics X1 £500	Good Good	Superb value for money from a system with solid straightforward engineering at an attractively low price	Auto-reverse record transport, auto-disc/tape editing, surround sound, remote	BB	77
Technics X5D £800	Very Good Very Good	A mainstream system offering considerable flexibility and power in a traditional suit of clothes, and embodying values that place music first	Twin auto-reverse, tuner/timer, auto record deck, digital amp	R	77
Yamaha AST-C10 £600	Average+ Very Good	Brilliant if flawed luggable with weighty, powerful bass, and a rare combination of expressiveness and clarity unprecedented from such a small package. Good features.	Mains portable twin cassette/CD/radio system detachable speakers, remote	R	77

TUNERS

The radio medium operates at a much lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live Prom concerts can rival all other sources from a hi-fi perspective. Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for receiving certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen amplifier

cosmetically. However, the task they carry out is far from simple (or cheap), combining the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on local reception conditions, but money invested in a high quality outside aerial system is well spent.

Tuners come in two basic types. Analogue models tune gradually (and usually manually) across

the bands, and can have analogue or digital displays; they are often preferred for sound quality, and are certainly best for AM bands. Digital tuners offer convenient automatic tune facilities and hold many station positions in pre-set memories.

(The Lab and Sound results for models tested in issue No. 65 refer to FM only. For AM results see under Comments.)

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai AT-52L £150	Very Good Very Good	Holds its own on FM against many much more expensive tuners, but AM is very poor	All bands	BB	65
Akai AT-93L £250	Good+ Good+	By AM standards presentable (good) while FM delivers the goods	All bands, aerial switch	R	65
Arcam Alpha £149	Good Average+ +	Attractively classic British analogue tuner with sound quality comfortably better than most	FM/AM Analogue	BB*	50
Arcam Delta £270	Very Good Very Good	Hi-fi sound on FM, good on AM, a dependable British all-rounder	6AM, 6FM presets. FM/MW. LW display manual tune	BB	55
Denon TU 450L £130	Average+ Average+	Poor AM sound quality may be a deterrent but the FM performance fully merits recommendation	FM/AM Digital MW/LW	R	50

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Harman Kardon TU920 £299	Good Average	Rather weak sound quality for the price despite good lab test results	16 presets, AM/FM, digital auto scan, active tracking		55
Harman Kardon Citation 23 £559	Good Very Good	Fine performance, interesting features and ease of use are this tuner's forte, and the sound quality is top notch	FM/AM seek/manual adjustment muting 16 presets remote control	R	60
Kenwood KT-660L £130	Fairly Good Fairly Good	You get your money's worth of gadgets and the radio's basically sound although programming is complicated. AM - fairly good	Timer, clock, all bands	R	65
Kenwood KT-1100D £300	Good+ Good+	Behind a gaudy and rather useless display the radio is much better than you might first think. AM - good	Firework display. FM/MW bands only	R	65
Linx Theta £400	Good Very Good	A Magnum Dynalab on the cheap with the hallmark styling of this small British newcomer. Some of the best midrange from any tuner	Manual analogue tuning, no presets, signal strength meter	R	72
Magnum Dynalab FT101 £599	Good Very Good	Although expensive for its fairly minimum set of facilities its excellent sound makes up for what it lacks elsewhere	Analogue manual tuning, no presets, signal strength meter	R	72
Marantz ST35L £125	Good+ Average-	It works well enough but the sound could be better for the money	16 presets, AM/FM, digital auto scan, active tracking		55
Meridian 204 £525	Good+ Good	Pleasant sounding with a fine finish but does not make the grade at this price	FM only, auto scan, digital, remote, clock timer		55
Musical Fidelity TI £300	Good+ Very Good	Top class FM stereo sound on good signal strengths from this audiophile model. Watch out for local CB!	FM only, analogue box dial, manual tune, signal meter	R	55
NAD 4020 £139	Good Average+	Not the quietest or most sensitive tuner tested, it still provided good sound for the money, being "musical and ambient"	Analogue FM/AM	BB	50
Naim NAT 01 £1098	Very Good Very Good	There may be better sounding tuners in the world, but we have yet to hear one	No presets. Two box, flywheel tuning FM only, Analogue	R	50
Nakamichi ST-7E £750	Good++ Good+	Exceptionally good for weak-signal areas, and good all round	16 AM/FM presets, Schotz enhanced sensitivity, auto time digital		55
Onkyo T9090 II £590	Very Good Very Good	It has most of the facilities you could possibly want and more beside. Lab performance and sound quality are both good enough to ensure recommendation even at this price	FM only, digital, 20 presets, auto scan etc.	R	72
Pioneer F91 £350	Excellent Good++	Easy to use, this model has excellent RF performance and scored very high ratings on the listening tests	FM/AM 24 presets	R	60
Proton AT-300 £199	Good Good	The AT-300 is pretty on the outside, orthodox on the inside and rather dear. AM - poor	FM/MW only	R	65
Quad FM4 £289	Very Good Good+	Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7 presets. Digital	R	50
Revox B260 £918	Excellent Very Good	Sophisticated and expensive, the B260 is ideally suited to the rest of the Revox range and should also work well in other systems	FM - virtually everything	R	60
Rotel RT-830AL £110	Good+ Good	Fine sounding budget audiophile material, no frills, no fuss	Manual dial analogue, FM, MW, LW	BB	55
Rotel RT-850AL £160	Good+ Good+	Scoring well on listening tests and one of the best sounding tuners at its price level, it was a bit let down on AM but RF performance was good	FM/AM, digital	BB	50
SAE T-102 £449	Good+ Good+	Expensive for all the radio you get, but sounds interesting. AM - Poor	FM/MW only	R	65
Sony ST-S300L/ ST-S100L £140/£100	Good Good	A reasonable entry point, not for difficult areas. AM - Poor	All bands	R	65
Sony ST 500ES £200	Good++ Average-	Disappointing sound quality but good lab performance. (Includes long wave)	10 AM/FM presets, auto scan digital		55
Sony ST-S 700ES £299	Very Good Very Good	First class in every respect including FM sound quality. Even AM was well above average	FM/AM, 10 presets, digital scan	BB	60
Yamaha TX-L400 £130	Good++ Good+	Good FM sound, let down by poor AM but otherwise good value	16 presets, auto scan, digital, FM, MW, LW	BB	55
Yamaha TX-500 £150	Average+ Average	Under a gaudy coat, this sensitive tuner gave reasonable stereo results. However, the AM had again been thrown down a well	20 presets (10 buttons) digital		50

Rating refers to original, tested model

HEADPHONES

There are a variety of different approaches to headphone design, and examples of each turn up in this group. Amongst the more expensive esoteric models, electrostatic drivers are used in square open-backed phones such as the Jecklin and Stax models. The majority of these come with some form of transformer which takes the signal initially from the speaker terminals on the amplifier. The actual speaker cables then travel from this unit *via* a

bypass switch to the loudspeakers.

The more down to earth models feature dynamic drivers in circular open-backed designs. The advantage of open backs seems to be a correspondingly open sound and a less claustrophobic feel to the music. One can also of course hear external noises and irritate people on public transport.

The third category are closed-back designs,

which are useful in situations where it is necessary to block out background noise.

Another means of distinguishing different types is the way they sit on your head or ears. There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs press on the outer ear (pinna); and intra-aural types rest inside the ear and are popular amongst users of personal stereos.

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Aiwa HP-X30 £30	Good Good-	A flashy personal stereo phone which alternatively could be used at home. A slight LF tonal preference slightly colours the response, but it ain't a bad can	Supra-aural, closed-back, dynamic		75
Aiwa HP-V99 £50	Good- Average+	Horn loaded in-ear miniatures with plenty of guts but not enough transparency or bass to compete with the headbanded competition	Intra-aural, closed-back, dynamic		75
Aiwa HP-X80 £50	Good Good	A headphone that's highly suited to non acoustic music and portable sources, nicely made and slickly finished. Sound quality doesn't quite match the price	Supra-aural, closed-back, dynamic		75
Aiwa HPEX-200 £90	Good Good	Modern looking and well finished the Excelias, as they are dubbed, had meaty bass and sounded reasonably open for the type	Circumaural, closed-back, dynamic		63
AKG K135 £35	Poor Fair	Despite a very appealing design the K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural, semi-open, dynamic		63
AKG K145/S £58	Good+ Good+	Electrostatic tweeters combine with a dynamic mid/bass unit to create very confident sounds in a comfortable headphone. Balance is on the bright side	Supra-aural, semi-open, electrostatic/ dynamic	R	75
AKG K240 Monitor £60	Very Good Good	Something of a classic these AKGs are very user friendly in all respects; sonically on the warm side of neutral	Circumaural, semi-open, dynamic	R	63
AKG K280 Parabolic £110	Good Very Good	A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural, open-backed, dynamic	R	63

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

HEADPHONES

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
AKG K340 £136	Good Excellent	Heavyweight cans in most respects, the K340 with its electrostatic tweeter is a very revealing headphone. Gives the total electrostatics a good run for their money	Circumaural, closed-back, electrostatic/dynamic	R	75
Audio Technica ATH 909 £55	Average Average	Quite impressive in the treble though a bit bass shy, the 909s worked well at highish levels	Circumaural, semi-open, dynamic		55
Audio Technica ATH 910 £65	Average Good	The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural, closed-back, dynamic	R	55
Audio Technica ATH-911 £75	Very Good Very Good	Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural, open-backed, dynamic	R	63
Beyer DT 325 £30	Very Good Fair	Lightweight in more ways than one, the 325s may be a little bright for some systems and tastes but will suit duller sources	Supra-aural, open-back, dynamic	R	63
Beyer DT330 Mk II £45	Good Poor	Not the most revealing 'phones encountered, the 330s were nevertheless enjoyable and rarely offended	Circumaural, semi-open, dynamic		55
Beyer DT550 £69	Good Good	On their own the 550s sound articulate with a slightly 'gritty' treble and 'keen' midrange; not suitable for headbangers!	Circumaural, semi-open, dynamic		55
Beyer DT880 £90	Good Good	Well made cans with a warmish sound but fairly solid midrange, though they're not that informative for the price	Circumaural, semi-open, dynamic		63
Beyer DT990 £119	Very Good Very Good	The 990s are definitely a significant pair of dynamic headphones; they have a smooth and yet revealing, neutral sound that is hard to criticise.	Circumaural, open-back, dynamic	R	55
Beyer IRS690 £200	Good+ Very Good	High quality infra-red headphones with soft comfy earpads and mellow but informative sound quality which is hard to dislike	Circumaural, open-back, dynamic	R	75
Jecklin Float Model One £79	Good Very Good	Whilst very unusual in appearance the Floats give remarkable sound quality and openness at a reasonable price	Circumaural-ish, open-back, dynamic	BB	55
Jecklin Float Model Two £99	Good Very Good	Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. Note lack of adjustment means you should buy before you buy	Circumaural-ish, open-backed, dynamic	R	63
Jecklin Float Electrostatic £399	Good Excellent	One version of the state-of-the-art, these electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural-ish, open-back, electrostatic	R	55
JVC HA-D990 £65	Good+ Good+	Good looking well made cans that offer good sound quality for the money. Sonic nature is of the easy-going, laid-back variety	Supra-aural, closed-back, dynamic	R	75
Koss TD/60 £20	Good Average	Although they're devoid of channel identification and have a decidedly Stateside approach to sound, these are very listenable phones for the price	Supra-aural, closed-back, dynamic		75
Koss K/6X Plus £30	Fair Poor	'Sixties-style' phones from the good ole US of A, their sonic style is unique and can make a system sound quite different	Supra-aural, closed-backed, dynamic		63
Pioneer SE-72 £30	Good+ Average-	Neat, nicely made personal stereo oriented phones along the lines of Sony V3s. Sound is on the veiled side, good for aggressive sources	Supra-aural, closed-back, dynamic		75
Quart Phone 30 £40	Good Fair	Whilst not as seductive as their PMB25 predecessor the 30s are reasonably neutral and do improve on some of the competition - though not stunning	Circumaural, semi-open, dynamic		63
Quart PMB 25II £40	Good Good	Despite a somewhat unconventional suspension system the 25s put in a convincing and enjoyable performance with warm yet lively balance	Circumaural, open-back, dynamic	BB	55
Quart Phone 70 £70	Good Good	Competent performers that were hard to criticise but lacked the life and sparkle of which some of the competition are capable	Circumaural, closed-back, dynamic		63
Quart PMB 65 £70	Good Good	Quite revealing and neutral albeit with the usual closed back sound, this competes well with more established models	Circumaural, closed-back, dynamic	R	55
Quart PMB 85 £90	Fair Very Good	These more expensive Quarts bear a striking resemblance to the Jecklin Float models and use two drivers per ear. Sound is a bit bass heavy but not bad overall	Circumaural, open-backed, dynamic		63
Realistic Pro-X £25+	Poor Average-	Robust, unanimously uncomfortable and heavily veiled in sonic terms - not a great success	Supra-aural, closed-back, dynamic		75
Ross RE2530 CD £20	Average Average	Rather an 'average' £20 phone that some found uncomfortable due to high pressure on the ears. Sonic balance is on the bright side	Supra-aural, closed-back, dynamic		75
Ross RE2560 CD £25	Good Average+	If you're not too fussy about quality of finish and don't have an elfin head then these British phones warrant attention. Sound could be smoother	Supra-aural, semi-open, dynamic		75
Ross RE-2760 £35	Poor Fair	Stylish white cans from the only British firm in the business. Unfortunately sound quality is not up to par in this price range	Supra-aural, closed-back, dynamic		63
Sennheiser HD30 £13.50	Good Poor	Built specifically for the personal stereo market these small and light Sennheisers have a slightly synthetic sound, but are an upgrade on the average Walkphones	Supra-aural, semi-open back, dynamic		55
Sennheiser HD40 £18	Very Good Good-	Very light and comfortable headphones with an even sonic balance that will suit most sources, but jack is 6.3mm and not suited to personals	Supra-aural, semi-open, dynamic	BB	75
Sennheiser HD450 £27	Good Fair	Modern, simple and lightweight phones that are remarkably robust and which turned in a relaxed if weighty performance that was at worst pleasant	Supra-aural, semi-open, dynamic	R	63
Sennheiser HD480 £37	Good Fair	Using the same shell as the 450s, the 480s were a little softened and unrevealing by comparison with their competitors	Supra-aural, semi-open, dynamic		63
Sennheiser HD420SL £47	Good Good	The 420s gave a full and tangible quality to instruments and voices; whilst not the most revealing headphones around they would suit slightly brash sources	Supra-aural, open-back, dynamic		55
Sennheiser HD520 £60	Good+ Good+	A very comfortable and musically capable headphone. If you've got this sort of bread to blow on cans, give 'em a blast	Circumaural, semi-open, dynamic	R	75
Sennheiser HD530 £70	Very Good Good+	One of the better dynamics in its group, the 530s create a sense of space that eludes most sub £100 cans, and they're dead comfy to boot	Circumaural, semi-open, dynamic	R	75
Sennheiser HD540 Ref Gold £160	Good Very Good	The 540 Golds prove that dynamic headphones can be subtle, informative and capable of creating a remarkable sense of space	Circumaural, open-back, dynamic	R	55
Sony A21L £20	Good- Good-	Forward facing in-ear drivers on a folding plastic band provide exceptional clarity for such an inexpensive phone. However, no bass, and fit isn't to everyone's taste.	Intra-aural, semi-open, dynamic	BB	75
Sony MDR V3 £30	Fair Good	Portable stereo oriented phones that are very nicely made and combine clarity with a pleasant lack of distortion	Supra-aural, closed-back, dynamic	BB	63
Sony MDR-V5 £50	Very Good Average+	A nicely made comfortable headphone let down by a limited ability to reproduce music in a natural fashion	Supra-aural, semi-open, dynamic		75
Sony MDR V7 £70	Very Good Very Good	Classy sounding cans that are very slick and work well with all types of music, setting the standard in their price range	Circumaural, closed-back, dynamic	R	63
Sony MDR-CD999 £120	Good+ Very Good	A very nice headphone in all respects, the 999s are worthy of the best headphone outputs and high quality sources	Supra-aural, semi-open, dynamic	R	75
Sony MDR-R10 £2500	Excellent Very Good+	Costly state of the art sealed moving coil design built to the highest standards using the finest materials. Sound quality reflects this care, being clear, sweet and refined	Circumaural, closed-back, dynamic	R	72

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

HEADPHONES

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Stax SR34 £140	Fair Very Good	The least expensive Stax headphones around, the SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural, open-back, electret		55
Stax SR84 £210	Very Good Very Good	The stepping stone between dynamics and full-electrostatics, these electret phones are revealing, open and highly enjoyable	Supra-aural, open-backed, electret	R	63
Stax Gamma pro/SRD-X pro £296/£230	Very Good Excellent	The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural, open-backed, electrostatic	R	63
Stax SR Gamma £299 (inc. SRD-6 Adaptor at £100)	Very Good Very Good	The next model down the Stax range from the Lambda, the Gamma is an excellent headphone with little to criticise but the price.	Circumaural, open-back, electrostatic	R	55
Stax SR Lambda Pro £545 (inc. SRD-7SB Mk 2 Adaptor at £185)	Very Good Very Good	A bit of an industry reference the Pros are frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural, open-back, electrostatic	R	55
Stax SR Lambda Pro SRM-1 energiser £360/£635	Very Good Excellent	This combination extracts layers of information that other headphones only hint at. The SRM-1 has more edge than the SRM-T1, but it's good	Circumaural, open-back, electrostatic	R	75
Stax Lambda Signature/SRM-T1 £470/£895	Very Good Excellent	The Signature when combined with the SRM-T1 valve driver must be the most transparent headphone available	Circumaural, open-backed, electrostatic	R	72
Yamaha YHL-006 £30	Average Average	Unusual personal stereo oriented phones that curl up when not in use. Earphones are like golf balls and balance is well suited to Walkmans	Supra-aural, open-back, dynamic		75

PERSONAL STEREO

Whilst not exactly hi-fi components, personal stereos probably play more music to more ears than all manner of domestic systems and as such demand some attention. Now that personal CD players have joined the ubiquitous Walkman in the market, the variety and standard of sound quality is huge, with obscurely named cassette players practically falling out of your cornflakes packet and Discmen going for £300.

Despite their diminutive size personals attempt to incorporate as many gimmicks and features as

possible, cassette players often incorporating tuners, graphic equalisers and Dolby noise reduction. CD players are still relatively expensive and don't tend to vary that much on the features front, rather the amount and quality of accessories differs. Most models come with a mains adaptor and some include remote control.

Sound quality on the cassette front seems to have a proportional relationship to price and integrity of construction – wow and flutter being quite obvious on the cheaper models. CD players

become less noisy as they get dearer and also reduce in size; one drawback of the latter seems to be that immunity to shock suffers as a consequence. Cassette players do, on the whole, seem better suited to the outdoor life than their digital counterparts, as does the software. Bear in mind that the sound and lab ratings given below cannot realistically be compared to those in other categories or between cassette and CD personals.

PERSONAL CASSETTES

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa HS-PL300 £110	N/A Average	Good looking, simply laid out player with a sensible selection of features and reasonable sound quality for a small player of this price	Dolby NR, chrome/metal eq, remote		78
Aiwa HS-PX303 £150	N/A Good	Chunky and macho styling combines with comprehensive features and a half decent transport to make a powerful personal	Dolby B & C, chrome/metal eq, remote	R	78
Panasonic RQ-P505 £100	N/A Poor	Very attractive and neat little player with nicely designed controls and XBS bass boost, but sonically it's limited by distinct wow and flutter	Dolby, chrome/metal eq, remote		78
Panasonic RQ-P525 £120	N/A Average+	Fitted with what is effectively a bass only tone control and harbouring all the necessary features the 525 also has a knack with tape replay	Dolby B & C, chrome/metal eq, remote	R	78
Philips D6558 £30	Very Poor- Poor	The low price limits sound quality, and this is not a spectacular machine, but it does a reasonable job nonetheless	Graphic EQ, AM/FM		56
Saisho PS90R £40	Poor Poor	A bit of a jumble of features and gadgets, the PS90R has on-board speakers, an extending aerial and even records, but sound quality is dubious	Graphic EQ, types I, II & IV, AM/FM, recorder		56
Sharp JC-270E £130	N/A Average-	Slightly old fashioned design combines with a basic feature count and mediocre sound quality to make an apparently uncompetitive player	Dolby, chrome/metal eq, remote		78
Sony WM-BF65 £90	N/A Average+	Regular size radio/clock/cassette player with a bright even open balance and Sony's forward facing phones. Not as glamorous as slightly more expensive models but sonically not bad	Dolby, chrome/metal eq, radio, alarm clock	R	78
Sony WM-701C £150	N/A Good-	Beautiful little machine with all the necessary buttons'n'switches and a fundamentally exceptional sound quality, marred unfortunately by wow and flutter	Dolby B & C, chrome/metal eq, remote, folding phones		78
Sony Walkman Pro £249-£289	Good+ Very Good	One of the finest sounding cassette decks on the market today. A mandatory Best Buy, it takes other personals to the cleaners (except on weight and power consumption)	Dolby B, C, types I, II & IV, record, line BB in/out, varispeed		52/56
Toshiba KT-4549 £80	N/A Poor	Fully equipped with 10 preset radio and alarm clock the KT-4549 is a bit aggressive on the sonic side and the bass boost system lacks balls	Dolby, chrome/metal eq, radio, alarm clock		78

PERSONAL CDs

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Goodmans GCD-10 £120	Average- Poor	Cheap, flashy and not short on accessories the GCD-10 is a rather noisy player that left a lot to be desired on the sound quality front	13.5 x 3.7 x 18cm, 478g, mains adaptor		66
Kenwood DPC-77 £270	Good+ Very Good	Very chunky and well made, the DPC-77 is the only player to include a digital output and sounds very good through its analogue output – a suitable domestic alternative	12.8 x 3.5 x 14.5cm, 750g, digital output, mains & in-car adaptors	R	66
Philips D6800 £130	Average Average-	A competitively priced and reasonably attractive looking player whose sonic performance is somewhat marred by a rather grainy top end	13 x 4 x 17.5cm, 516g, 3" ready, twin hdph sockets		66
Sanyo CP-12 £260	Fair Good+	Sonically amongst the more enjoyable personal CD players and capable of revealing the musical aspects of a disc in an interesting and entertaining fashion	12.5 x 2 x 12.7cm, 380g, wired remote, mains adaptor	R	66
Sony D-20 £150	Average+ Fair	Not bad for a machine at this price, it's nicely designed and reasonably robust, with reasonable sound quality	13.8 x 3.8 x 15cm, 450g, mains adaptor	R	66
Sony D-88 £300	Average- Fair+	A stylish and 'cultish' object, the D-88 is very small and has an adjustable disc drive for three and five inch discs. Sound quality doesn't quite match appearance	9.4 x 3 x 9.8cm, 300g, 3" ready, mains adaptor, no line out		66
Sony D-150 £300	Fair+ Very Good	One of the most enjoyable machines encountered, sounding informative and sweet and looking very tasty to boot. Comes complete with a tough carrying case	12.6 x 2.1 x 13.5cm, 420g, 3" ready, R mains adaptor	R	66
Xenon CDP-03 £180	Average- Fair+	A well made and competitively priced machine that is ergonomically spoilt by flat slightly unresponsive buttons. Sound quality ain't too bad but a trifle boring	12.6 x 2.7 x 12.6cm, 560g, high frequency filter, key lock		66

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

CD PORTABLES

CD Portables or Yuppie Blasters as we classified them are basically portable stereos gone digital, ie a compact disc player is included alongside the usual AM/FM radio and single or double cassette deck. Compact disc is a novelty that seems to add a fairly hefty premium onto the price of the standard ghetto blaster, but the improved sound quality over standard cassettes may justify this for some. In virtually every case a CD output socket is

fitted which means that it's possible to play silver discs through a domestic amplifier and loudspeakers, thus they are some sort of substitute for standalone mains machines (as are the personal CD players). One drawback with having a CD player on board is that batteries are gobbled up even quicker than usual, up to ten batteries being required in some cases. Neither are the units particularly light, the heaviest weighing eight kilos!

However they do all run off the mains too, and come with an appropriate lead for this purpose. Other useful features common to most are spare input sockets to record from an external line source such as a preamplified vinyl disc signal, and microphone sockets for recording live events (although the usual lack of record level adjustment is a nuisance).

MODEL PRICE	SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa CSD-XL25 £150	Poor	It's cheap, cheerful and not too low on features but sound quality from disc is frankly uninspiring	Twin headphone sockets		73
Bose Acoustic Wave £750	Very Good	Not exactly a CD portable as it doesn't play discs, but a highly versatile and stylish radio cassette player that has bass	Input sockets, Dolby NR, PA capable etc	R	73
Grundig RR9000CD £300	Average	Relatively slick machine with full CD function and volume remote control, low on features for price and unspectacular sounding	Remote, motorised volume pot, condenser mic		73
Philips AZ8394 £200	Average—	Stylish in a wasp like fashion, unfortunately the disc playing lets it down somewhat but otherwise it's OK	Twin decks, graphic eq., bass boost, condenser mic		73
Sharp QT-CD43 £280	Average	Quite a beefy box that comes complete with remote control for volume and CD functions. It even has a surround sound option which enhances imaging	Clock, speaker outputs, powered volume pot		73
Sony CFD-D73 £280	Good	The model we received was intended for the Japanese market and thus may not be entirely representative but it made reasonable sounds and has novel features	UHF bandwidth, input sockets, graphic eq., Megabass	R	73
Sony CFD-DW83 £300	Average	A macho looking beast capable of highish levels, but unimpressive sound for the price. Nice styling and good for scratching	Clock, timer, balance, input sockets, graphic eq.		73
Toshiba RT-8089 £200	Poor+	Square and long but rather drab on the sound quality front, as well equipped as most but rather tiny in many respects	Clock, twin decks		73

STANDS AND SUPPORTS

It's becoming more and more apparent that all the components in a hi-fi system benefit from being placed on the right kind of support. It is already acknowledged that performance of electro-mechanical transducers, such as turntables and loudspeakers, can be greatly improved by using highly rigid supports. This notion has been expanded to include electronics such as amplifiers and compact disc players, and inevitably a broad range of stands and supports have been produced to cater for this requirement.

With loudspeaker stands there seems to be two

broad schools of design. The most common is the open frame type which uses square section steel tubing (usually less than an inch square) made up to form a tripod or quadropod stand usually fitted with spikes top and bottom to ensure good coupling to both floor and cabinet. However, for reasons of domestic harmony this latter option is often not pursued as eagerly as perhaps it should be. The alternative approach is to use mass. Larger section (approximately 3 inch x 2 inch) tubing is welded between square top and bottom plates and filled with sand and/or lead shot. Again, this type uses

spikes at the base but Blu-tack or the like for coupling with the speaker cabinet.

Equipment supports generally place isolation quite high on the list of priorities and usually use a lightweight steel frame to support an MDF platform. Once again spikes are used to minimise contact with the platform and ensure good coupling to the floor. Minimising weight without compromising rigidity seems to be the aim with turntable supports but those designed for electronics often employ some form of damping to kill vibration, sometimes in the form of mass.

LOUDSPEAKER STANDS

MODEL PRICE	TYPE FINISH	COMMENTS	TOP PLATE SIZE HEIGHT	VALUE	BACK ISSUE FULL REVIEW
Apollo AB20 £40	4 leg Fair	A light open-framed budget design slightly lacking in rigidity and subjectively superceded by other stands costing £10 more.	19 x 19cm 53cm		58
Apollo A10 £47.25	4 leg Fair	A robust and lightweight model, it would make an ideal upgrade for those still happy with the big boxes of old.	19 x 19cm 44cm	R	58
Foundation Fred £65	2 leg Average	With sand filling the Freds made speakers sound tight and coherent with a more even balance.	19 x 19cm 36/43/59cm		58
Foundation Maggi £159	Pair Very Good	Made for Magneplanar and other similar panel speakers they seem to have a healthy effect on the sound quality thereof.	50 x 2cm 2cm	R	58
Foundation Pi £250	2 leg Very Good	Overpriced in material terms the Pi nevertheless has a very positive effect on the low frequency performance of conventional speakers.	20 x 20cm 25/38/46/53cm	R	58
Heybrook Point 5 £50	3 leg Very Good	An unusual triangulated open frame stand that can help certain speakers sound more transparent and fluent — a good value stand	23 x 21.5cm 47cm	BB	58
Heybrook HBS1 £75	4 leg Very Good	With its new aluminium base frame the HBS1 fared very well in the listening tests. It allowed much of the speakers own 'sound' to remain intact.	23 x 21cm 47cm	R	58
Linn Kan II £79	4 leg Very Good	Built to support Linn's Kan speaker this stand is well suited to the task, but is less successful with other loudspeakers.	19 x 16cm 59cm		58
Linn Sara £85	4 leg Very Good	The Sara exhibits some odd properties so its use other than with the Sara loudspeaker should be viewed with caution.	25 x 21cm 53cm		58
Monotrak Engineering M1 £58	1 leg Good	The M1 gave the mid and treble a commendably smooth and detailed presentation but bass sounded rather lacklustre and muddy.	19 x 18.5cm 48cm		58
Monotrak Engineering M4 £58	4 leg Very Good	Begging comparison with Heybrook's HBS1 the M4 maintained much of the openness and forthright detail of that model.	23 x 21.5cm 53cm	R	58
Monotrak Engineering M4S £58	4 leg Very Good	Its stature and stability would seem to mark it out as most suitable for smaller, lighter cabinets. The M4S possessed an open midband and clear treble.	20 x 17.5cm 53cm		58
Mordaunt-Short IS1 II £45	3 leg Good	Suited to low mass speakers, preferably using spikes to effect coupling, they sounded slightly 'jazzed' but the overall sound was quite unclouded.	18 x 15cm 56cm	R	58
Origin Live £117	3 leg Good	An unusual tripod stand devoid of top plate and taking up more floor space than normal, subjective and technical performance was exemplary.	(support area) 22 x 17.5cm 52cm	R	58
Partington PP4 £50	1 leg Good	The PP4 offers a rather mixed performance, though when damped with sand infill it was less ready to embellish the overall sound and low frequencies became tauter and quicker.	18 x 16.5cm 48cm		58
Partington Dreadnought II £120 (filled)	1 leg Very Good	Ideal for systems on the light/bright side of neutral, the Dreadnought IIs nevertheless still need some careful re-examination. Partington.	17.5 x 16.5cm 63cm		58
QED TS22 Tristand £50	3 leg Very Good	Most tracks sounded uplifted or buoyant, never thick nor coloured. It worked well with most of the speakers tried and encouraged a fluid and revealing midband.	19 x 17cm 45/50/58cm	BB	58

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

LOUDSPEAKER STANDS

MODEL PRICE	TYPE FINISH	COMMENTS	TOP PLATE SIZE HEIGHT	VALUE	BACK ISSUE FULL REVIEW
RATA Torlyte £190	2 panel Excellent	Suited to low mass speakers, these unusual stands are hardly discreet but offer transparent and clean sound – much like the Torlyte table!	25 x 21cm 48cm	R	58
Target HS20 £55.75	1 leg Excellent	This monopod stand can be used either filled or unfilled and encourages different characteristics in the sound accordingly.	19 x 16.5cm 53cm		58
Target HJ15/3 £94	3 leg Very Good	Sound quality was basically very good though without the sand infill some loudspeakers may sound a little unbalanced as both bass and treble regions are subjectively exaggerated.	28 x 28cm 40cm	R	58

EQUIPMENT SUPPORTS

MODEL PRICE	TYPE FINISH	COMMENTS	SIZE (H x W x D)	VALUE	BACK ISSUE FULL REVIEW
Audioquest Sorbothane Feet £10 each	Feet Good	These large gumdrops are very useful for damping vibrations in amplifiers and especially CD players.	6.5 x 2.5cm (circular)	R	57
Cornflake TCS5 £50	Table Very Good	A little too close to the ground for comfort, perhaps, but this novel and stylish little table is certainly worth seeking out.	29 x 43 x 33cm	R	57
Cornflake TCS6 £50	Shelf Good	A squat and rigid frame supports a Medite top board with four adjustable spikes, better suited to suspended sub-chassis turntables.	43 x 23 x 33cm		57
Deltec Isolation Base £135	Platform Good	Designed for all CD players, amplifiers and separates, but not suspended sub-chassis turntables, the isolation is second to none.	50.5 x 40cm	R	57
RATA Model A £125	Table Very Good	A three-legged Torlyte turntable support that has become something of an industry reference.	46 x 46.5 x 38.5cm	R	57
RATA Amplat £40.25	Platform Very Good	A lightweight and rigid Torlyte slat with spikes for floor or shelf mounting, it works well in conjunction with the Target TT2.	4 x 44.5 x 35cm		57
Sound Organisation Table £55	Table Very Good	A deceptively simple structure that just happens to be engineered in a thoughtful, and ultimately successful manner.	37 x 45 x 35cm	BB	57
Sound Organisation Wall Stand £40	Shelf Very Good	The first of its ilk and still amongst the best, this simple framework represents a vast improvement over standard furniture shelves.	27.5 x 43 x 35cm	BB	57
Target TT1 £42.75	Shelf Excellent	This rigidly braced shelf offers both good sound quality and material value for money.	26 x 46.5 x 35.5cm	BB	57
Target TT2 £49.95	Table Very Good	Standing up to the best in most areas, the TT2's only real foible concerns a slight loss of bass 'slam'.	52 x 46.5 x 35.5cm	BB	57
Townshend Suspension Base £145	Platform Fair	Designed to complement the Rock turntable, this platform will bring subjective improvement to a wide range of electronics.	43 x 36cm	R	57

CABLES AND CONNECTIONS

Although cables and connections are sometimes thought to be the least important items in an audio system there has been a growing awareness in recent years that they have a significant effect on sound quality. To this end there is now a vast array of exotic cables and interconnects available to those interested in experimentation. The key observation on cables is that they are much more than mere accessories. Carrying the audio signal, just as any amplifier does, it's really not too surprising that they can influence the quality of that

signal. The characteristics of any cable are determined by the materials and topologies utilised in its construction. The purity of the conductor, nature of the insulator dielectric, mechanical construction, physical geometry, RF characteristics, efficiency of screening and finally the connectors themselves, all play vital roles in the sonic character. These factors tend to vary more with interconnect cables which are used to carry the signal between active components like pre and power amplifiers. The

interconnects summarised here were tested in 1m terminated lengths and therefore the results and prices relate to that length – some cables may well perform differently when used in longer lengths. The features column contains information on the material make-up of the different cables with the following abbreviations: OFC – oxygen free copper, OFHC – oxygen free high conductivity (Audionote define the HC as high crystal), PC-OCC – pure copper by ohno continuous casting, LC-OFC – linear crystal oxygen free copper.

INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Apature LSD N/A in UK	Poor Fair	Faint resonant boom was audible at very low frequencies, but otherwise this cable sounded remarkably neutral.	Silver plated copper, PTFE dielectric		59
Audioquest Livewire Topaz £35	Good Fair	Sounding 'bigger' and faintly richer than Reference 2, Topaz was also slightly grainy at the top end.	Gold-plated plugs, OFHC copper		59
Audioquest Livewire Ruby £49	Fair Good	Smoother sounding than the Topaz, the extended crystal Ruby is less grainy and coarse, better able to resolve complex passages.	FCL copper twin axial	R	59
Audioquest Livewire Quartz £75	Good Good	Quartz has an ideal, neutral balance that embodies sparkling clarity without the drawbacks of harshness or compression.	3 piece plugs, PTFE dielectric	R	59
Audio Technica AT6115 £50	Very Good Fair	This cable sounds somewhat 'quieter' than the original LC-OFC interconnect, but is also less transparent and three dimensional.	PC-OCC copper coaxial		59
Audionote Copper ANC £35	Fair Good	ANC sounded punchy with a faintly lean but tightly-focused bass character. This crystalline precision waned slightly at higher frequencies.	OFHC copper twin-axial	R	59
Audionote Flexible Silver ANS £85	Fair Very Good	ANS scored a hit with its transparent midband and revealing but quite unforced treble quality. Bass transients were slightly softened.	Silver signal & Copper screen	R	59
Audionote Silver ANV £140	Poor Very Good	Far weightier-sounding than the flexible ANS, ANV interconnect also possesses a fair degree of treble clarity and sparkle.	21 strand silver Litz		59
Aural Symphonics N/A in UK	Poor Good	This cable enjoyed an open and transparent midband and sounded remarkably neutral and faithful to the source.	OF copper PTFE dielectric	R	59
Budget Patch Cords see text	Fair Poor	As thrown in gratis with cassette decks and the like – frequency extremes were restricted and performances were veiled.	Thin coaxial		59
Budget OFC circa £7	Fair Fair	Subjectively, this cable did lift much of the aural fog experienced with scrawny standard hook-up leads.	OFC		59
Deltec Slink £32	Good Very Good	Ideally used in lengths of under 4 metres, it errs on the lean side of neutral but has an uncommon transparency in the midrange.	4 silver plated OFC strands PTFE dielectric	BB	59
Deltec Black Slink £152	Excellent Excellent	Inherently neutral the cable faithfully reproduced broad and deep stereo soundstages with precise focus and a sense of tactility.	8 silver plated OFC strands PTFE dielectric	R	59
Denon LC-OFC N/A separately	Very Good Fair	Supplied with Denon's dearer CD players this cable introduced a peculiar 'twangy' coloration at high frequencies, and a slightly soft bass.	LC-OFC, non-magnetic gold plated plugs		59
DNM Solid-core £15-£25	Fair Good	Transparent in the midband and full of sparkling detail in the treble, low bass was slightly curtailed (unterminated price £2.30 per m.).	Single strand nickel-plated copper. Unshielded	R	59

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Kimber Kable PSB £32	Very Good Very Good	An exceedingly transparent midband but slightly 'clanky' treble. It always managed to sound remarkably uncluttered and open.	OFC, PTFE dielectric	BB	59
Kimber Kable KC-1 £47	Very Good Fair	Tonally faintly leaner and brighter than the more open-weave PSB, KC-1's treble detail was just too sharp and grainy.	Multi-gauge PTFE dielectric		59
Kimber Kable KC-AG £375	Good Very Good	Treble detail resolution was perceived in a slightly abrupt if wholly controlled fashion. Depth re-creation and lateral separation were excellent.	Multi-gauge silver, PTFE dielectric	R	59
MDM Interconnect £14.95	Good Fair	The subjective performance of MDM did appear a little imprecise at the frequency extremes, but a worthwhile upgrade on budget interconnect.	Coaxial, solid core, gold plated plugs		59
MIT PC-Squared £75	Fair Good	This multi-gauge cable produced a very open and buoyant midband but sounded slightly 'peculiar' at frequency extremes.	OFC, multi-gauge	R	59
MIT Spectral MI330 £193	Poor Fair	MI330 displays a marvellously open and enticing midband quality, bass is warm and rich but this character has a tendency to dominate.	Multi-gauge balanced bandwidth		59
Monitor PC 0100381 £17	Good Fair	There is more than a hint of instrumental muddling and bass is slightly soft, however, the slightly 'shut-in' sound is par for the course at the price.	OFC, coaxial	R	59
Monster Interlink 400 £30	Good Good	Bass is solid and punchy, counterpointed by a slightly overblown midband which tends to make vocalists sound larger-than-life.	Multi-gauge	R	59
Monster Interlink CD £44	Fair Fair	Low frequency is commendably weighty, but the top-end sounds vague and lacking in image focus. Suited to some systems better than others.	Multi-gauge		59
Monster Interlink Reference £88	Good Fair	Protracted listening indicated a lack of dynamic speed – a subjective sluggishness. It may prove well suited to up-front systems.	Multi-gauge Balanced bandwidth Gold plated plugs		59
Myst Tm £15.60	Fair Good	Fairly neutral with a pleasantly open and transparent midband. Some deep bass detail is lost but treble is sharply focused.	Solid-silver PTFE dielectric	BB	59
Origin Live Soli-Core Super £60	Good Fair	Improves over previous Soli-core samples in stereo depth and bass weight, but a 'loud' treble presentation remains.	Solid-core gold-plated AT plugs		59
QED Incon P1-Gold £14.95	Good Good	A lively open presentation that just borders on the lean side of neutral, the quick and lucid delivery affording considerable musical insight.	OFHC, gold plated Deltron plugs	BB	59
QED Incon Graphite GP1 Gold £18.95	Fair Fair	A shielded version of Incon P1, it sounded thicker at the frequency extremes, the top end being coarser and more out of focus. Good for long runs though.	OFHC Graphite shielding	R	59
Sony RK-C310ES £40	Excellent Good	Possessing deep firm bass and a sparkling top end it offers a balanced perspective with negligible coloration	Coaxial LC-OFC	R	59
Sterling £250	Fair Good	Possessing a neutral if faintly rich overall balance it supplies a pleasantly open and transparent perspective. (Reviewed in pre-production form.)	2 silver strands per conductor		59
Thorens SAC 100 £50	Good Fair	Performance is undermined by a slightly coarse and splashy treble, not necessarily bright, simply rather confused – and fine detail lacks resolution.	Silver-plated OFC, coaxial		59
Van den Hul MC-D300II £59	Poor Good	It tended to highlight some upper mid detail, but a generally open and spacious acoustic proved its saving grace. Slightly soft at LF.	Silver plated single strand VdH plugs	R	59
Van den Hul MC-1021II £69	Good Good	Possessing the same endearing qualities as the D300 it presented open and transparent soundstages and improved timbral resolution	Twin axial silver plated copper	R	59
Van den Hul MC-D502 £77	Fair Fair	The tonal balance was 'tilted' by a strong and authoritative bass line, which had the knock-on effect of muting treble detail. A bit dear.	Twin axial silver plated copper, teflon dielectric		59
Van den Hul Thunderline £147	Good Fair	Thunderline essentially parallels the sonic performance of the cheaper D102. HF is occasionally tainted by a 'tizzy' coarseness, bass is tight and	Silver plated 'matched copper'		59
Van den Hul MC-Gold £247	Fair Good	It possesses a rich and beguiling treble balance that matches a weighty, slightly warm bass character. Seductive balance may prove worthwhile in some circumstances.	Silver & gold plated copper		59
Van den Hul MC-Silver £747	Good Good	Although remarkably transparent for an asymmetric design this costly cable was not considered to be of 'state-of-the-art' standard, and is bettered by cheaper models.	19 silver plated copper strands		59
Vecteur 8045 £49	Very Good Good	Sounding solid and forthright it might seem slightly cold in some systems but the treble 'edge' is mercifully clean. Very low frequencies were a little lacking in 'slam'.	LC-OFC signal & screen	R	59

LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Absolute Wire Force 4 £4.50 per metre	Good Fair+	By current standards there was a loss of fine, sharp detail at the frequency extremes, but it has a big and friendly sound	744 OFC strands, PVC dielectric		64
Audionote OR-200 £16 per metre	Fair+ Fair+	Open and detailed throughout the midband but a grainy coloration tended to corrupt subtle timbral information at very high frequencies	200 LC strands, polyurethane and cotton dielectric		64
Audionote AN-SP £100 per metre	Average— Very Good	A clean and open sounding cable that offered a deep and pleasantly detailed perspective. Bass was slightly restricted, but seemed tight and coherent nonetheless	15 silver strands, polyethylene dielectric		64
Audioquest Livewire Black £15 per metre	Good Good	It proved clear and punchy but with some grain across the treble. Nevertheless Black remains an interesting concept and proved better than Livewire Green	OFHC, surface only – foam core construction	R	64
Audio Technica AT6120 £95 – 10m	Fair+ Fair	Compared to earlier LC-OFC cables this PC-OCC derivative sounded smoother and less aggressive	PC-OCC, PVC dielectric		64
Bellwire 12p per metre	Poor Average—	Broadly speaking it delivered a bright and tizzy sounding treble with a fairly open and detailed mid with little or no bass resolution	0.5mm single strand, PVC dielectric		64
Deltec 8S £144 – 5m pair	Good Good+	The unerring transparency and detail resolution of 8S throughout the midband makes it a far cleaner and more spacious sounding cable than others at the price	4 silver plated OF copper strands, PTFE	R	64
Deltec Black Sixteen £456 – 4.5m pair	Very Good Excellent	Bass was deep and rhythmically secure, the mid tonally pure and free of additional sibilance while the treble was both relaxed, sweet and highly detailed	16 silver plated OF copper strands, PTFE dielectric	R	64
DNM Solid core £2.30 per metre	Average Fair	A good general-purpose solid-core, though too bandwidth limited for high-end applications. Sounds great in some systems	0.65mm single strand, webbed PVC dielectric	R	64
Exposure £2 per metre	Good Good	It could sound a trifle matter of fact but this emotive flattening was also somewhat dependent on the music program. It is also highly suited to long runs	56 OFC strands, webbed PVC dielectric	R	64
Kimber Kable 4PR £49.45 – 5m pair	Fair Fair+	This directionally marked cable benefitted from an open and airy treble quality but seemed notably leaner than 4TC. Bass was well round and satisfyingly taut	4 x 7 copper strands per conductor, PVC dielectric		64
Kimber Kable 4TC £16 per metre	Good Good+	4TC made a great impression in the listening tests with an open midband, a smooth and un-fatiguing treble with slightly rich but suitably weighty bass	OF copper, PTFE dielectric	R	64
Linn K20 £2.20 per metre	Good Fair	Subjectively it erred on the forward and bright side of neutral but enjoyed an essentially clear and punchy delivery	56 OFC strands, webbed PVC dielectric		64

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

THE DIRECTORY

LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Marantz ML-55S £30 – 10m	Fair Fair	Subjectively this cable offered a loose and splashy treble which, though not overtly bright, did compromise both tonal and timbral accuracy	30 OFC strands, 3 conductors PVC dielectric		64
Mission Cyrus £2.50 per metre	Average+ Good	Because of its impedance characteristic this cable will deliver a smooth and unfatiguing treble balance with loudspeakers offering an easy load	0.8mm single strand, PVC dielectric	BB	64
Monitor PC Silverline PC4 £5.75 per metre	Good Average	Sonically it laboured under a heavy and claustrophobic balance, lacking the see through transparency and lucidity of the better solid core cables	2072 x 0.07mm silver plated copper strands		64
Monster Superflex £2.50 per metre	Fair+ Fair+	Treble detail was both reserved and confused though there was little in the way of harshness and grain. Deep bass notes were also found to be lacking	OFC, multistrand, Duraflex dielectric		64
Monster Original £4 per metre	Good Fair+	Original sounded relatively congested and murky at higher frequencies but possessed weight and conviction in the bass	Multistrand		64
Monster Powerline 2 £12 per metre	Good Good-	Powerline stamped its own hallmark on the sound with a strong taut bass and an essentially clear midband giving tactile stereo images	Multistrand, helical construction		64
Musical Fidelity Lifeline £11.50 per metre	Fair Good-	Lifeline did demonstrate a strong directional inclination, affording a laid back but fairly neutral balance when correctly oriented	4 x 0.8mm PC-OCC strands	R	64
Naim NAC-A4 £2.25 per metre	Good Fair+	Tinged with brightness while the deep bass response seemed both over heavy and poorly integrated compared to the immediate competition	Multistrand, webbed PVC dielectric		64
NVA £6 per metre	Average+ Good	A light and breezy sounding cable best suited to short lengths, NVA benefitted from a clear and transparent outlook	7 x 0.25mm silver alloy strands, PTFE	R	64
Origin Live Soli-Core Ordinary £1.80 per metre	Good Fair+	Subjectively it bettered the performance of the costlier Super version, affording a pleasantly detailed and spacious soundstage with firm bass but slightly coarse treble	1.8mm and 0.5mm single strands	R	64
QED 79-Strand 90p per metre	Good Fair	For much of the last decade QED 79-Strand has been the first port of call for enthusiasts on the upgrading ladder, a tradition that should still hold true today	79 strand, PVC dielectric	R	64
QED Incon Graphite £1.75 per metre	Fair+ Fair+	This graphite version of Incon sounded cruder and generally more heavy handed than the cheaper unshielded type. Overall presentation was mildly restricted and cloaked in a faint aural fog	OFHC, polymeric screen		64
QED Flat 200 £1.95 per metre	Good Good	I detected a degree of confusion at low frequencies but this did not stifle the acoustic atmosphere which remained open and positive	200 strands, flat webbed PVC dielectric	R	64
Rotel Supra 4 £2.49 per metre	Good+ Good	Ideal for both long and short runs, it furnishes a big sound that benefits further from a smooth, unfatiguing treble	1,036 OFC strands, webbed PVC dielectric	R	64
Rotel Supra 10 £6.49 per metre	Good+ Good	Supra 10 provided a very free and open sound that was unhindered by any excess at low frequencies. Worth its weight in scrap copper!	2,562 OFC strands, webbed PVC dielectric	R	64
Sony RK-S5ES £59.95 – 5m	Fair+ Fair+	The sound of this cable was also somewhat controlled and over damped. The treble was relatively free and airy but lower octaves, including the midband, were constrained	350 x 0.08mm OFC strands, heat shrink dielectric		64
Solid core mains cable 36p per metre	Fair+ Good	It enjoys much of the smooth treble and articulate midrange usually associated with the better solid core derivatives. Lean but taut and rhythmically coherent	1.5mm square, 3 cores, PVC dielectric	BB	64
Sterling £499 – 5m pair	Fair Fair	This pre-production sample possessed a strangely muddled and reserved sound quality. It suffered from a progressive instrument modulation that totally confused more complex orchestral passages	Pure Silver, PTFE dielectric		64
Townshend Isolda £400 – 5m pair	Fair+ Good	Isolda possessed a truly dark background out of which rose a very solid and extended bass together with an excellent sense of transparency through the upper octaves	8 coax cables per conductor – very thick	R	64
van den Hul CS-122 £5.50 per metre	Fair+ Good-	Characterised by a driving and powerful bass, CS-122 proved to be a heavy sounding cable. Mid treble detail was refreshingly clear but there was a slightly muted air about the extreme treble	19 x 0.45mm silver plated strands, webbed rubberised dielectric	R	64
van den Hul CS-352 £12.95 per metre	Good Fair+	Subjectively it sounded like CS-122 only more so, the deep rumbling bass tending to overwhelm subtle musical details. It also appeared a trifle peaky in the treble	7 x 0.76mm + 168 x 0.125mm silver plated strands, rubberised dielectric		64
van den Hul SCS-12 £29.95 per linear metre	Good+ Good+	SCS-12 set a high standard with a tight and well focused soundstage populated with tactile stereo images. Bass wasn't as extended or resolved as some other cables	19 silver plated strands of 12 different gauges, PTFE dielectric	R	64
van den Hul SCS-2 £99.95 per linear metre	Good+ Good+	Overall it was commendably neutral and transparent but nothing less would be acceptable bearing in mind the tremendous cost of a stereo pair	665 silver plated matched crystal copper strands, PTFE dielectric	R	64
Vecteur R-CV30 £4.99 per metre	Fair Good	Subjectively the better of Vecteur's three-strong cable line-up offering a neutral overall perspective but with a slight loss of detail resolution at both frequency extremes	4 x 0.8mm LC-OFC PTFE insulated strands	BB	64
Vecteur S-CV90 £1.99 – 5m pair	Fair+ Fair+	It seemed both less transparent and integrated throughout the midband than R-CV30, though both frequency extremes were spruced up with a tighter sharper delivery	6 x 0.7mm LC-OFC strands		64

FURUKAWA ELECTRIC CO., LTD.

IF YOU CAN FIND A BETTER CABLE . . . WE'LL REFUND YOUR MONEY



The best interconnects, **regardless** of price. – David Wren, Radlett Audio. (0923) 856497

These cables represent **tremendous value** coupled with **staggering performance**. – David Campbell, Zeus Audio. (0232) 332522

If you can find a better interconnect below £600.00 we want to know about it. – Jack Lawson, The Music Room. (041 248) 7221

Amazing cables probably the best regardless of price. – Barry Haycock, Hi-Fi Excellence. (0224) 624408

Superior cables at very impressive prices. – Tony Gascoigne, Lintone Audio. (091 477) 4167

Contact any of the above, or for further information:

QUANTUM AUDIO LTD.,
22-26 Nelson Street, Kilmarnock KA1 1BA. Tel: (0563) 71122

If within 14 days of purchase, you're unhappy with these interconnects or cables, the above participating sales outlets will refund the purchase price in full.

THE DIRECTORY

IN-CAR ENTERTAINMENT

In-car entertainment is an area not usually associated with the esoteric world of domestic hi-fi. However, it represents a source of musical entertainment that many of us are exposed to every day. The majority of new cars are fitted with some form of radio before they leave the showroom and in many cases this usually very basic player is taken for granted and accepted as representative of in-car audio standards.

For the price of a budget amplifier or more, there is a wide variety of in-car machines to choose from,

including cassette, CD and even DAT players. The majority of sub £300 players are integrated units featuring a cassette player, AM/FM tuner and amplifier, all in one remarkably compact standard sized box. At this price level the cassette players tend to be fairly basic affairs, although autoreverse and noise reduction systems are both fairly common. Tuners are usually of the digital variety with varying degrees of sophistication in signal tuning and presetting, with some machines featuring as many as 18 FM presets. The emphasis is on the frequency

modulated band and AM often suffers as a consequence, but fortunately for radio enthusiasts there are some exceptions.

The amplifier is usually designed to drive two pairs of speakers mounted fore and aft of the vehicle, and a fader is fitted to adjust the balance between the two. The dearer machines feature separate bass and treble controls which can be quite handy given the unusual acoustic of the car environment and the variety in balance and presentation to be had from car speakers.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Alpine 7282L £250	Good Very Good	A very attractive and seductive sounding player. The matt surfaced transparent preset keys are especially sexy	Bass/treble controls, 12 FM 6 AM presets, chrome eq., clock, 3W	R	61
Alpine 7905M/3539 £650/£350	Excellent Excellent	An easy to use and attractive CD/tuner, partnered with a powerful and flexible amplifier to give an effortless source of in-car entertainment	Bass/treble controls, 12 FM, 12 AM presets, slide-out, 150W	R	68
Blaupunkt Windsor SQR 38 £275	Good Average	Not very enthralling sonically, the Windsor is rather low powered but does have a reasonably stable tape transport	5 FM, 10 AM presets; 3.1W		62
Clarion 916HP £160	Good Average	With its rubbery buttons and touches of white this is a modest looking player let down by a weak cassette	Bass/treble controls, 5 FM, 5 AM presets, 9W		61
Clarion 946HP £250	Very Good Very Good	A good FM side let down slightly by AM performance. This Clarion is particularly nice to use with its nifty SAM tuning system	Bass/treble controls, 12 FM/6 AM presets. Slot-in, 15.1W	R	61
Clarion CDC7000/10028HA £650/£250	Very Good Excellent	Despite a slightly off-beat cartridge system the Clarion combo put in a performance that had the sonic edge over other CD/tuners in its test group	Bass/treble controls, 12 FM, 12 AM presets, security code, 80W	R	68
Goodmans GCE229 £150	Fair Average	If knobs, switches and legends are your bag then the GCE229 is the one for you – a lot of gizmos for the price and it even sounds OK	Bass/treble controls, 6 FM/6 AM presets. Chrome eq., clock, MSS, 10.1W	BB	61
Hitachi CSK-402E £250	Good Good	An attractively designed little player that for once doesn't disappoint when it comes to playing music, and it even has a security system	Bass/treble controls, 6 FM, 12 AM presets, Dolby, chrome eq., music search, 7.4W	R	62
Nakamichi TD-400E/PA-300 II £495/£329	Very Good Very Good	If you want your in-car entertainment to compete on sound quality grounds with your domestic system, this combo offers a very strong challenge	Bass/treble controls, 5 FM, 10 AM presets, uni-directional, chrome eq., Dolby B, C, 75W	R	62
Nakamichi TD-700E/PA-300II £874/£329	Very Good Excellent	For those who appreciate the wonders of analogue there are few in-car players to really compete with this superb cassette/radio. You can even adjust azimuth	Bass/treble controls, 6 FM, 6 AM presets, music search, Dolby, 75W	R	68
Panasonic CQ-497 £117	Fair Poor	The CQ-497 has a traditional style analogue tuning system making it easy to use. AM reception was good but the other sources are less encouraging	Bass/treble controls, chrome, NR, 7W		62
Philips DC680 £180	Average Good	A colourful and musically competent player that despite a gammy volume knob is well worth checking out.	8 FM, 4 AM presets 3.5W	R	61
Pioneer DEX-M300/CDX-M100/ GM-3000 £300/£450/£280	n/a Very Good	Separate control unit and boot mounted multi play autochanger make this a bit of a hefty installation but it uses the same magazines as their domestic players and sounds fine	Bass/treble controls, 18 FM, 6 AM presets, 80W, removable fascia		68
Proton 214CD/D275 £300/£175	Very Good Very Good	This Proton cassette/tuner offers good power and a level of fidelity appropriate to its price. Musically it has a Decca-like charm that is very appealing, plus a sensitive radio	Bass/treble controls, 8 FM, 8 AM presets, Dolby B/C NR, chrome eq., 85W	R	68
Sharp RG-F816E £200	Poor Average	Nothing if not novel the 816, with its unusual anti-theft system is custom built for the furry dice brigade, but is sonically a bit lacklustre	Four band graphic, 8 FM, 16 AM presets, ASP, Dolby, MSS, 10.9W		62
Sharp RG-F882E £220	Average Average	Again a glitzy full feature machine with a flip out control panel and plenty of lights. However, sound quality is a bit disappointing	Seven band graphic, 5 FM, 10 AM presets, ASP, chrome eq., Dolby, 8.5W		62

RECEIVERS

Purists will look down their noses at the very idea of combining two functions into one box, and indeed they always have done. But unless we're talking about the exotic elite, the creme de la creme of amplifier and tuner, intrinsic technical shortcomings simply aren't an issue.

One obvious reason why you should buy a receiver if you were otherwise considering an amplifier and a tuner is that there are savings, ie of

size. Generally you end up with one box in place of two similarly sized boxes, which has got to be a good idea. Receivers are also simpler to operate, in principle anyway. At the very least you save on one power switch, and typically you are presented with an integrated control system that is bound to oil the wheels of ergonomics

But there is one important point to watch. Because receivers don't sell in vast quantities in

this country, and because this is one of the very few countries to use Long Wave for public service broadcasting, many – no, most – receivers on sale in this country cover FM and MW only. Remember that LW is the home of Radio 4, where it can be heard on the all too frequent occasions it is not on FM.

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Harman Kardon HK330Vi £259	Average Average—	No LW, and FM section best suited to strong, local transmissions. The amplifier is quite powerful but favours the treble. Bass is tuneful but lacks weight	5 inputs (inc 2 tape), FM/MW tuner		70
Harman Kardon HK440Vxi £299	Good Good	Clear, dynamic, slightly bright sounding design, a little grainy in extremis. Mono switching and LW missing from tuner, which otherwise performs well	5 inputs (including 2 tape) with FM/MW tuner	R	70
JVC RX-777VL £500	Good Good	Sharp, lively but euphonious sound quality from line and phono source is matched to a high grade tuner. However, many half-baked facilities blunt value for money	A/V capable with 6 inputs, equaliser, digital ambience, FM, MW/LW		70
JVC RX-1001V £770	Average Poor	Power output is well below spec, and sound quality is cluttered and messy on all inputs	Digital ambience processing, Dolby Surround, 2/4 speaker, 40 FM/MW presets		70
Revox B285 £1782	Average Average—	Sophisticated and capable tuner is married to a muddled, compressed sounding amplifier, which also has low sensitivity preventing the amplifier being driven fully in many situations	70 watts/ch, 4 inputs (inc 2 tape), 29 FM/MW/LW presets		70
Rotel RX-850AL £230	Good Good	Well built and sensibly equipped receiver with outstanding sound quality for the price via the tuner, phono and line sources alike. It majors on subtlety however, and may not impress the heavy metal brigade	4 inputs (inc 1 tape), FM/MW/LW tuner	BB	70
SAE R102 £599	Average— Average	This is an uneven but mostly good performer. It sounds constrained but musical, but the tuner is weak on both wavebands.	4 inputs (inc 2 tape), FM/MW tuner		70

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

DEALER GUIDE

SHROPSHIRE HI-FI THE HI-FI SPECIALIST

ARISTON, AUDIO TECHNICA, CAMBRIDGE AUDIO, CELEF, DENON, DUAL, HEYBROOK, INFINITY, ION, MANTRA, MORDAUNT SHORT, MUSICAL FIDELITY, MONITOR AUDIO, MARANTZ, NVA, PROAC, QED, ROTEL, TARGET, TEAC, ETC. TANNOY, ROKSAN, TOWNSHEND

Demonstration Room, Free Parking, Free Installation, Repairs

CLOSED THURSDAY

SHROPSHIRE HI-FI, ST. MICHAEL'S STREET,
SHREWSBURY 0743 232065

SMC GROUP

BUY! SELL! EXCHANGE!

We accept for cash or exchange ALL 2nd hand Audio & Video equipment.

Everything accepted in ANY condition – absolutely NOTHING refused!

MUSIC & VIDEO EXCHANGE
56 Notting Hill Gate, London W11
Open 7 days 10am-8pm
Tel: 01-727 0424

Peter TYSON
The NAME you can TRUST

6 ABBEY ST, CARLISLE. TEL: 0228 46756

(Hi-Fi & Service Centre)

Products we stock include:-

Linn-Acoustic Research-Mission-Cyrus-Technics
-Marantz-Kenwood-Aiwa-Denon-Dual-Pioneer-Akai-Ariston-Creek-Allison-Musical Fidelity-Nakamichi and Philips.

"Demonstration Facilities" "Part Exchange Welcome"
"Free Delivery & Installation" Access & Visa accepted
"Cumbria's Premiere Hi-Fi Centre"

DOUGLAS SHOP NOW OPEN ON LOCH PROMENADE 0624 74505

0624-815521

ISLAND COMPACT DISC & HI-FI CENTRE

ORIGIN LIVE OPENING TIMES MON-SAT 9-5-00PM

PARLIAMENT SQUARE RAMSEY, ISLE OF MAN

DEM FACILITIES

ARISTON • AKG • HECO • SNELL • ARCAM • GOLDRING • MUSICAL FIDELITY • SURE • JBL • PHILIPS • CELESTION • WHARFEDALE • SUGDEN • KOSS • BEYER DYNAMICS • MICHELL • AUDIO INNOVATIONS

TEL: (0624) 815521

Hastings Hi-Fi CONSULTANTS

32 WESTERN ROAD, ST. LEONARDS. (0424) 442975

Selected Hi-fi from – LINN, MUSICAL FIDELITY, EXPOSURE, QUAD, NAKAMICHI, MONITOR AUDIO, ROGERS, TANNOY, NAD, ROTEL, MARANTZ, AUDIOLAB, CELESTION, ARCAM, DENON, KEF, TDL, CAMBRIDGE AUDIO, YAMAHA.

& Many more.

- OPEN MON-SAT 9.00-6.00
- TWO LISTENING ROOMS

WE'VE MOVED
CHICHESTER HIGH FIDELITY

Appointed stockists of A&R Cambridge, Denon Castle, Creek Audio, Goldring, Linn, Naim, Quad, Rega, Rogers, SME, Monitor Audio, Nakamichi, Roksan, Royd, Sendor, Tannoy

7 St. Pancras, Chichester
Telephone 0243 776402
(Closed all day Monday)

NAD

ROTEL

B&W

DENON

Dual

Norman H. Field

Hi-Fi

Technics

ALBANY HOUSE,
HURST STREET,
BIRMINGHAM B5 4BJ
Telephone: 021-622 2323

YAMAHA

HI-FI MARKETS
The place where people are about hi-fi

Smith's
EDGWARE ROAD

Established 1910

THE HI-FI SPECIALIST
Single Speaker Dem Room
Appointed Stockists for:-
Akai · Aiwa · Ariston · B&W
Denon · Dual · Exposure · Heybrook · Incatech · JVC · JBL
Kenwood · Marantz · Nakamichi · Philips · Revox
Sony ES · Technics · Townshend · Systemdek · Yamaha
plus accessories

H. L. SMITH & Co. Ltd.,

287-289 Edgware Road, London W2 1BE
Telephone: 01-723 5891/7595 Fax: 01-724 6101

Access, Visa, Amex, Diners.

THE DIRECTORY

VIDEO RECORDERS

For some time there's been a move to improve both the video and the audio quality of video recorders and TV sets alike as a necessary prelude to a proper integration between the two. Hi-fi video is obviously an important element in the story, and so is Dolby Stereo, the ambient 'surround sound'

system. The weak link of course is on the broadcast side. Although TV sound is well up to normal hi-fi standards, it has always been in mono and unjustly or otherwise has rarely attracted much audiophile interest. But TV sound is – or shortly will be – freed of the shackles of mono by the introduction of NICAM

stereo. NICAM – an acronym for Near Instantaneous Companding and Modulating – is the missing link that will help facilitate the much feted integration of video with audio. And then we have S-VHS, a system which does for picture quality what the other developments promise to do for the sound...

NAME PRICE	LAB SOUND & PICTURE	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai VS-75EK £550	Average Good	Excellent performance and a slick set of controls make this recorder a pleasure to use. Good price is a bonus	Hi-fi, NICAM, programmable remote	BB	71
Akai VS-77EK £700	Average Good	Another fine and carefully designed model from the impressive Akai video stable. The Dolby installation, whilst flawed, is certain to increase interest in the system	Hi-fi, NICAM, Dolby Surround decoder & stereo amp	R	71
Ferguson FV33H £500	Very Good Below Average	Beer budget NICAM has excellent tape search facilities and an intelligent remote control. Neither picture nor sound quality however are state of the art, and ergonomics are poor	Hi-fi, NICAM, transmitter LCD remote control		71
JVC HR-D750EK £500	Good Average+	Well sorted and relatively affordable NICAM recorder with LP sound only. It is pleasing to use and helpfully equipped, especially when trying to find individual recordings buried in long tapes. Performance is good in relation to price	Hi-fi, NICAM, transmitter LCD remote control	BB	71
JVC HR-S5000EK £1000	Good Very Good	This is the first domestic S-VHS recorder on the market, and it's an unusually well designed one with a wide range of well sorted features and controls. Sound and picture quality are close to state of the art, and miles ahead of any non-S-VHS recorder	S-VHS, Hi-fi, NICAM, LCD remote	R	71
Mitsubishi HS-B70 £1000	Very Good Very Good+	Superb model, and true state of the art picture quality, though you'll need a high grade S-VHS compatible monitor to reap full advantage. The facilities are also wide ranging and generally helpful	S-VHS, Hi-fi, NICAM, LP & SP, programmable remote	R	71
Nordmende V4405K £799	Good Good	Fine basic sound and picture quality, but the RF converter introduced significant losses. An excellent model, but configured for German home market. VPS compatibility is of no practical use here, and the recorder lacks NICAM	Hi-fi, transmitter handset, digital FX		71
Panasonic NV-FS1 £1000	Poor Good	The control system is poorly organised, with cramped legends and some strange machine logic. Bar code programming is hardly a great achievement either. Picture and sound quality are good, but not state of the art	S-VHS, Hi-fi, NICAM, bar code programming		71
Sanyo VHR-D4710E £900	Very Good Good	Fine colour and moderate detail make for a basically good video section to match a fine sound section. Some of the facilities are a little disappointing however and the deck looks expensive	Hi-fi, NICAM, infra-red headphone remote, digital FX		71

COLOUR TELEVISIONS

The standalone television set is rapidly evolving into a key component in integrated home entertainment systems. NICAM digital stereo sound is now being broadcast for several hours a week from London and Yorkshire transmitters, so stereo CTVs are now becoming available equipped with NICAM decoding and with rather more attention paid to the built-in amplifier and speakers.

NICAM is also available on Hi-fi stereo

videorecorders (see above), and this is usually the more practical route for hi-fi system integration, as well as allowing favourite musical events to be saved on tape. To both watch and record with stereo sound will require NICAM on each of course, but the decision to update one or the other first will probably have as much to do with the age of the respective components than the convenience of the interconnections.

The ten CTVs tested so far are all luxury stereo models with 'flatter squarer' 59cms tubes of various kinds. Best suited to a viewing distance of about 7ft, these are one size up from the most popular 51cms size sets and take about 23 per cent of the top 30 per cent of the market. All have remote control, Fastext (enhanced teletext), and many have on-screen graphics and flexible in/out socketry.

NAME PRICE	SOUND PICTURE	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ferguson 59K5Q £599	Average— Good	Attractive and compact design highlights unusual (and rather nice) matt finish Super Planar tube. Picture and ergonomics are pretty good but on-board audio is a bit of an afterthought, lacking sufficient welly for music programming; socketry adequate	59cm SP FST, NICAM, Fastext, o/s graphics	R	76
Grundig ST-63-460TT £649	Average— Average+	Bulky set's shape resembles a square-rigged sail; screen tilts back slightly, so might suit floor mounting, though beware room reflections. Picture quality is good, if a touch bland, but ergonomics are fairly impenetrable – no on-screen graphics either. Halfway respectable sound quality is over-enriched by cabinet drone.	59cm FST, NICAM, Fastext		76
Hitachi C25-P759 £699	Average— Average—	Visually very compact and neat, with excellent handset ergonomics and good on-screen graphics and features. Picture quality 'hyped' and compromised by 'peaked' luma response; on-board sound has muscle but not subtlety, and NICAM (SCART) output lacks muting.	59cm FST, NICAM, Fastext, o/s graphics		76
ITT Nokia £629	Average+ Average—	Bulky square-rigged shape helps deliver a respectable standalone sound quality at a modest enough price. A versatile set with good handset but no on-screen graphics, the picture quality of our sample lacked fine detail resolution, lending a 'soft focus' effect	59cm FST, NICAM, Fastext		76
JVC AVS250 £550	Average+ Average—	This compact and delightfully versatile non-NICAM set has respectable on-board stereo sound and lovely screen graphics, along with an infernal handset. Our sample suffered a tuner problem which marred a picture quality which was pretty good when monitoring baseband signals off tape.	59cm FST, Fastext, o/s graphics		76
Mitsubishi CT-2553 STX £649	Average Good	Arguably the best all-rounder in the group, this compact monitor-style set suffers from exasperating ergonomics but the picture is detailed if a shade untidy, the sound lusty if crude. NICAM (SCART) output lacks muting, and colour rendition a shade individual	59cm FST, NICAM, Fastext, o/s graphics	R	76
Panasonic Prism TK-24 W1 £699	Average+ Average—	Handsome but bulky set delivers serious standalone sound quality. Lovely ergonomics but off-air picture quality marred by tuner section noise on our sample (works fine as picture monitor). Good NICAM (SCART) output.	59cm FST, NICAM, Fastext, o/s graphics		76
Philips 5574 £599	Average Average+	Neat and compact for a front-speaker set, this competitively priced allrounder lacks on screen graphics and remote white level (contrast) but is otherwise well equipped, if a shade undistinguished and conservative	59cm FST, NICAM, Fastext	R	76
Sanyo CBP2559 £579	Poor Good+	Lovely subtle and detailed picture quality totally justifies strong recommendation, though handset is obtuse (lacking white level) and on-board sound is dire. NICAM £50 update due early 1990	59cm FST, Fastext, o/s graphics, picture-in-picture	R	76
Sony D2512U £699	Average+ Average	Beautifully styled around the unique Trinitron tube, the sound benefits substantially from the odd looking detachable loudspeakers. Nice ergonomics with good on-screen graphics, the otherwise detailed picture is a little 'hyped'.	59cm Trinitron, NICAM, Fastext, o/s graphics	R	76

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



GLOSSARY

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

AM: Amplitude modulated; see 'Medium Wave'.
ACOUSTIC BREAKTHROUGH: Sound that gets into the turntable and hence the cartridge from the air and thereby creates a risk of acoustic feedback.
ACOUSTIC FEEDBACK: If any sound in the room can find its way through the body of the record deck to the cartridge stylus, then that sound will be reproduced from the loudspeakers, along with the wanted programme material. If too much of this sound from the loudspeakers is picked up by the cartridge in this way then a vicious circle of acoustic feedback will be created.
ACTIVE: Speaker systems which contain electronic crossovers and where the drive units are connected directly to power amplifiers.
ALIGNMENT PROTRACTOR: A device used to minimise the lateral tracking error of a cartridge/arm combination.
AMPLITUDE: Size or magnitude; hence the amplitude/frequency response, known normally simply as the frequency response, which describes the relative loudness of the system at different frequencies with a constant input voltage.
ANECHOIC: Without echo; a special room or 'chamber' with thick sound absorbing materials on all surfaces to prevent reflections.
ARM MASS: More accurately called *effective* arm mass, because it is *not* the weight of the arm on a pair of scales. It is the mass of the arm and cartridge combination that appears to be concentrated at, and thus felt by, the stylus tip which is tracking a record groove. There is nothing inherently good or bad about arms with light or heavy effective mass; what matters is the manner and choice of their combination with cartridges of different compliance and the low frequency resonance produced by such combination.
AZIMUTH: With reference to tape and cassette recorders, the alignment of head gap to tape path.
BALANCE: 1) The overall relative loudness perceived at different frequencies (eg bass, treble); 2) the accuracy of the match between the two channels of a stereo transducer (eg cartridge or pair of loudspeakers).
BANDWIDTH: A range of frequencies with presumed defined upper and lower limits.
BASS: Lower part of the frequency spectrum.
BELT DRIVE: The motor has its rotational speed geared down to the required platter speed (33 $\frac{1}{3}$ rpm for LP discs) by a rubber or similar resilient belt which runs round a small pulley on the motor shaft and a large pulley attached to or part of the platter.
BEXTRENE: A plastics material frequently used for bass and mid-range cones.
BIAS: (*turntable/arms*) Because the cartridge on a pivotal arm is being drawn across the record surface by the stylus tracking at an angle offset from the pivots, groove friction produces an imbalance of lateral force. Bias is the application of a compensatory lateral force acting in the opposite direction.
BIAS: (*tape*) This refers to a high frequency current passing through the record head which allows the audio current also passing through the head to produce reasonably linear magnetisation of the tape at all levels permitted by the combina-

tion of each machine with the tape. The lowest level of bias is required for ferric cassettes, a slightly higher one for ferrichrome, an even higher one for chrome or pseudochrome, and the highest for metal.
BOTTOMING: The stylus scraping on the distorted rounded bottom of the groove due to incorrect stylus geometry.
CANTILEVER: The thin rod or tube that connects the stylus to the armature and hence the cartridge body.
CAPACITANCE: An element of electrical impedance that is particularly important when matching pickup cartridge, arm leads and amplifier input characteristics to achieve a flat frequency response from discs.
CLIPPING: This is reached when a circuit is overloaded and overdriven, resulting in bad waveform distortion and audibly unpleasant effects.
COLORATION: A general term used to describe the audible effects of distortions, particularly in loudspeakers and record players. These are usually caused by frequency response irregularities and/or resonances.
COMPATIBILITY: The selection of interdependent components to achieve optimum system performance; notably arm/cartridge mass/compliance matching, cartridge electrical loading, or loudspeaker compatibility with amplifiers.
COMPLIANCE: A measure of the springiness of the cantilever/armature seen from the stylus, expressed in compliance units (Cu), where 1 cu = 10⁻⁶ cm/dyne.
CROSSOVER: An electrical circuit which uses combinations of inductors, capacitors and resistors to divide the signal from the power amp into the required frequency bands and with any necessary equalisation for feeding to the individual drive-units of the speaker system.
CROSSTALK: The leakage from one channel to the other in a two channel stereo system.
CUTTER: Mechanism used to cut recorded signal onto lacquer master; consists of turntable, lathe, cutting head, cutting and servo amps.
DIN: German standards body, responsible amongst other things for a popular range of standard plugs and socket specifications.
DAMPING: A means of controlling resonances by means of a resistive medium (electrical, mechanical, or acoustic depending on situation).
DECIBEL (dB): A logarithmic unit that is convenient for expressing ratios that span a wide range on a linear scale. For simplicity it can be regarded as a measure of relative loudness.
DISTORTION: Literally this can mean any deviation from the original, but usually refers to harmonic rather than intermodulation distortions when not specified.
DOLBY: Covers various signal processing/deprocessing systems, but normally refers to the B & C noise reduction systems used in cassette record/replay, and the B system used for music cassette replay.
DOPING: A technique involving the application of damping to a loudspeaker driver cone in order to assist in controlling resonances.
DOWNFORCE: The weight, measured at the stylus, which holds it down in the groove.

DRIVE UNIT (DRIVER): The term used to distinguish the loudspeaker unit itself, be it bass, midrange, treble or fullrange in application, from the complete loudspeaker system which combines drive units, cabinet and crossover into a total design.
DROPOUTS: Momentary reductions of programme level due to inadequate head/tape contact caused by oxide particles shedding off the tape onto the head gap, or inadequacies in tape transport or tape.
DYNAMIC RANGE: The ratio in dBs between the quietest sound that can be successfully recorded and the loudest which can be accepted without serious distortion on an average programme.
EFFECTIVE MASS: The inertia, or mass-controlled resistance to movement, of a device, particularly important with regard to tonearms.
EFFICIENCY: The amount of acoustic power delivered for a given electrical input power.
ELECTROSTATIC: A principle employed in some loudspeaker transducers using static electricity effects to set up a polarising field within which the modulated transducer medium moves.
ELLIPTICAL STYLUS: A specially shaped stylus profile that makes the 'plan view' radius along the length of the groove smaller than the 'elevation view' contact radius viewed from the front.
EQUALISATION: (*general*) The deliberate modification of frequency response, usually in response to some engineering limitation or deficiency.
EQUALISATION: (*tape*) This refers to the necessary change in frequency response required of an amplifier so that overall flat frequency response is obtained from a tape medium. Equalisation is required both on record and replay. Any tape recorded on a good cassette recorder should have the same inherent response when played back on another correctly set up machine, since all playback equalisations should have been standardised. These standards are normally specified by the time constants of the circuits involved, eg 79 μ s or 120 μ s (see 'Microseconds').
FARAD: Measure of capacitance.
FM: Frequency modulated; often used to describe radio transmissions of high fidelity potential on the VHF band.
FARAD: Measure of capacitance.
FERRITE ROD: A short rod type aerial used for AM reception; may be fitted internally or externally to a tuner or receiver.
FERRO-FLUID: A magnetic fluid which is introduced into the voice-coil gap to provide damping and/or improved cooling.
FILTER: A circuit (normally) used to restrict the bandwidth of a system; may be fixed or switchable.
FREQUENCY RANGE OF SPECTRUM: Can refer to any particular group of frequencies, but commonly applied to the audible band from 20 to 20,000 cycles per second (Hz), extending from the deepest bass to the highest audible harmonics.
FREQUENCY RESPONSE: The variation in output over a frequency range, particularly of a transducer; can be expressed as a range with decibel limits, or depicted graphically.
Hz (HERTZ): 1 Hz = 1 cycle per second and is a measure of frequency which corresponds to musi-

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

HF: High frequency.

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

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

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

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

IEC: An international standards body.

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

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

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

KILO (k): prefix meaning one thousand.

LED: Light Emitting Diode; an indicator light.

LF: Low frequency.

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

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

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

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

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

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

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

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

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

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

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

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

magnetic coding on a tape.

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

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

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

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

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

NOISE: Random unwanted low level signals.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

THD: Total harmonic distortion.

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

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

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

TRANSIENT: Signal of very short duration.

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

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

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

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

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

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

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



PERSONAL MESSAGES

Better late than never, Paul Messenger nominates the most important hi-fi development of the '80s.

Addressing the keyboard on the very last day of the decade, the media are so totally hyped up with nostalgia and retrospection, it's almost impossible to resist the temptation to join in. And I've never been very good at resisting temptation. The consumer electronics industry has such a conveniently short memory, a ten year perspective tends to bring home the fact that the true rate of progress is far less rapid than the regular annual model update round implies.

There is progress of course, but it's surprising how perverse cause and effect can turn out to be. Given that the '80s was the decade in which print media went totally electronic, there's true irony in the fact that you still have to wait until the beginning of February to read this column. There's much more colour and gloss in today's hi-fi mags, but the copy-to-publication six weeks remains the same as it was in hot metal days.

I now process rather than type words, which is a real advantage for a lousy typist like me, and also happens to suit my style (or so I believe). I also save them to disk, steadily building up and storing collections of disks to which I rarely refer. Word processing is certainly quieter than typing – if far from silent – but it takes up much more desk space and makes a handsome contribution to the household spaghetti count.

The rising tide of mains and interconnection spaghetti – immortalised in John Cleese's original Sony midi system ads – stands out as a key symbol of the electronic '80s. Nowadays every little corner of the house seems to have its own little wiring loom served by multiplying four-way mains extension blocks.

The hi-fi system was always that way. No midi system for me – instead a three-way active system needs three stereo power amplifiers, six loudspeaker cables and five power supplies. I've never even attempted to count the leads (and have always been perplexed by one that seems to be left over). But the '80s have introduced several new

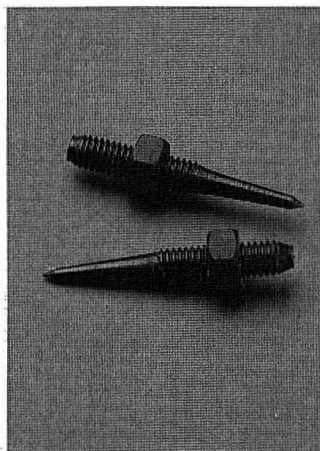
entanglements. The television now interacts with a video recorder (and maybe a hi-fi system, Dolby Stereo decoder and heaven knows how many loudspeakers) via numerous connector types and a bewildering variety of adaptors, culminating in the faintly appalling 21-pin SCART/Peritel.

Not to be outdone, the telephone has become a telecoms centre, with extra line for fax, plus answering machines, adaptors, extensions and whathaveyou. Cordless phones arrived just in time to avoid massive round-the-house extension wiring, though not without some sacrifice in quality and consistency. (I'm still trying to solve the chicken-and-egg conundrum of whether the fax machine was the cause or the effect in the current decline of the postal service.)

I could further digress into small appliances, battery/mains portable leads, rechargeable devices and batteries, all of which add to the festoons. Meanwhile, remote control handsets set up their nests and breed within soft furnishing nooks and crannies. These genuine free spirits of the electronics firmament invariably express themselves by rushing out and destroying themselves underfoot at the least opportune moments. (You try using a B&O TV over the Christmas/New Year holiday with an inoperative handset and long-lost manual.)

As far as hi-fi is concerned, plus of course the music sources on which it depends, I have to conclude that the '80s were not a particularly exciting decade. That's not to say the hi-fi industry isn't thriving, especially considering the doldrums of 1980 when consumers were spending all their money on videorecorders, home computers and personal stereos. CD has refocused public attention and spending on hi-fi, and the trade has benefited as a result. But does that alone constitute progress?

The fundamental reason for my reservation is that my own hi-



Spikes: where would we be without them?

fi system has hardly changed at all during the decade. It's evolved, to be sure, especially in terms of tonearms, cartridges and power supplies. But it's still the same basic Linn/Naim combination I was using more than ten years ago. From time to time I've been tempted to take a different route – the Apogee *Scintilla* representing the most memorable alternative to the *Isobariks* – but this has certainly been a period where hi-fi has inched forward only slowly.

The arrival of digital audio and compact disc has tended to muddy the pool and take everyone's eye off the musical ball. Many claim that digital is the greatest thing since sliced bread – an apt enough metaphor for this technological age. Myself, I use a bread knife, and mourn the loss of variety in grains, consistency and crust. Being an optimist, I hope that digital audio will eventually make a genuine contribution to advancing the art of musical reproduction. Being a realist, however, the history of recorded music thus far tends to support the more-pessimistic 'trash triumphs' theory of evolution.

Since I don't wish to spend the '90s scouring secondhand shops and record fairs for ageing and deteriorating vinyl, I shall retain my optimism that CD can be made to work well, given time. After all, it took a good many years to get the stereo LP with its

extra degree of mechanical freedom to replay as well as the best mono reproduction, back in the 1950s. CD is still only seven years old, and so deserves to be given a bit of a chance.

If it's mildly disappointing to note that most of my personal equipment dates back to the early '70s, and that the considerably older technology of valves/tubes has never been held in higher esteem, it is also true to say that there has been plenty of progress in improving the performance of popularly priced specialist hi-fi, especially turntables (arms and cartridges), amplifiers and speakers.

Ten years ago, the Rotels, Denons, Yamahas and Marantz of this world were still debating whether one amplifier sounded different from another. Now they've knuckled down to compete directly against A&R, Creek, Mission, NAD and so on. Bearing in mind that £100 today will only buy as much gold or groceries as less than £50 in 1980, the £99 pricetag on the gorgeous little new Mordaunt-Short *MS3.10* loudspeakers looks little short of miraculous.

Although the '80s brought little in the way of genuine progress, they did serve to help consolidate the role of specialist hi-fi within the overall scheme of things. 'Real' hi-fi equipment that places the emphasis firmly on musical qualities has never been more widely available, or seen so many competing brands.

If I was to nominate the most important development of the decade so far as genuinely high fidelity progress is concerned, it would not be immature advanced technologies like CD players and Digital Sound Processors. A simple mechanical device known technically as a High Impedance Interface, or more familiarly as a spike (as in spiked speaker stands) has to take first prize. Simply because, if we didn't spike our speakers and stands, we wouldn't be able to appreciate how good vinyl can be, and how indifferent CD really sounds. Talk about a return to Victorian values and virtues.



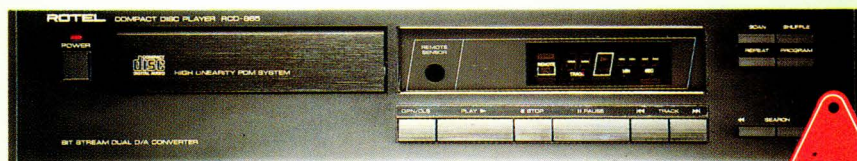
REACH FOR THE BEST



RCD855 COMPACT DISC PLAYER DUAL D/A CONVERTER



At a time when others are becoming lost in the bit war Rotel's no nonsense approach to quality engineering sets new standards for this Classic 16 bit 4 times oversampling system with a product which will offer lasting value. This new model from Rotel incorporates the very latest in understanding of circuit board layout and component selection resulting in very high levels of performance and musical involvement together with outstanding build quality.



RCD865 COMPACT DISC PLAYER PULSE DENSITY MODULATION



Rotel are proud to be one of the first companies to introduce a high performance C.D. player utilising the new bit stream PDM conversion system. Our research has shown that PDM, in conjunction with high quality circuitry and components, can produce outstanding sound quality with a level of musical involvement hitherto not available from compact discs. We strongly urge you to audition this fine product at the earliest opportunity.

These fine components are but a small selection from Rotel's award winning range of performance Hi-Fi Products which offer very high standards of technical excellence and musical enjoyment. The RCD855 and RCD865 are supplied with a numeric remote control handset and are fully remote compatible with Rotel's new RTC850L Tuner-Preamplifier. Phone or fax Rotel UK for further information and nationwide dealerlist.

UK DESIGN AND DEVELOPMENT

ROTEL UK,
25 Heathfield, Stacey Bushes,
Milton Keynes, MK12 6HR.
Tel. (0908) 317707 Fax. (0908) 322704

ROTEL *hiFi*
Ask someone who knows...

AND
SOUND
STYLE

MISSION ELECTRONICS



because people like music

MISSION-CYRUS GROUP . HUNTINGDON . PE 18 6ED . ENGLAND . PHONE (0480)52777 . TELEX 32333 . FAX (0480)432777