

£2.95

FEBRUARY 1989

# HI-FI CHOICE

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

30 TURNTABLES AND  
TONEARMS UNDER REVIEW

ASPIRATIONS  
VISITS THE HOME OF A DJ

# FREE!!

BETTER QUALITY SOUND  
FROM *YOUR* TURNTABLE  
WITH THE HI-FI CHOICE  
ELITE ALIGNMENT GAUGE  
DETAILED INSTRUCTIONS INSIDE

CD OFFER  
SAVE £5 ON DMP JAZZ CDs

140 AMPLIFIERS  
- SUMMARISED

124 LOUDSPEAKERS  
- SUMMARISED

20 CARTRIDGES  
- ON TEST

TEST SUMMARIES ON OVER 800 HI-FI  
PRODUCTS



# KRELL



## PAR EXCELLENCE

Krell amplifiers have the rare ability to impart a sense of unlimited power and musical authority. While other manufacturers aspire to this complete mastery of the musical signal, only Krell achieves it. In under a decade Krell has ascended to the top of the high end ladder, providing the amplifiers of choice for audiophiles and reviewers around the world. With the latest generation, Krell has further strengthened its claims, the new KSA-80 inspiring Hi-Fi Answers to write, 'The Krell is all about making music, carriage class'. Krell amplifiers; power with finesse.

Write or phone for perceptive advice and details of nearest dealer



Absolute Sounds 318 Worple Road Wimbledon London SW20 8QU  
Tel: 947 5047 Telex: 894800 Absol G.

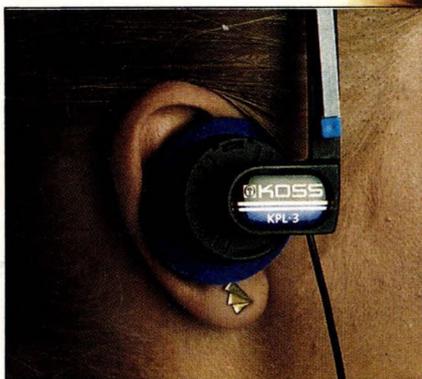
Air Tangent, Apogee, Audio Research,  
California Audio Laboratories,  
Counterpoint, DMP, Duntech, Entec, Goldmund,  
Kinergetics, Koetsu, Krell, Madrigal,  
Mandrake, Magneplanar, Micro-Seiki, PS Audio,  
Randall Research, Wilson Audio, Sonus Faber

'I have the simplest of tastes . . .  
I am always satisfied with the best'  
*Oscar Wilde*

# KOSS – The word on everyone's ears

## Koss Supersonic Technology (SST)

Designed specifically for use with today's digital technology, the SST's offer the best in sound and comfort. Whether you prefer the heavy bass and isolated sound of a closed-headphone or the open, airy sound of a hear-through-headphone, there's an SST model for you.



## Koss Porta Lite

A range of four headphones designed to meet the needs of the contemporary music lover whatever their budget. These models offer great portable sound with features like extra cushions, volume balance controls, even 1/4 inch adapter plugs for home use.



## Koss Fun 'N' Fashion

Portable listening never looked or sounded as great as the Fun 'N' Fashion headphones – the ultimate accessory for today's fashion-conscious listener. And because they're Koss, you get spare cushions, volume balance controls, adapter plugs, and of course, great sound.



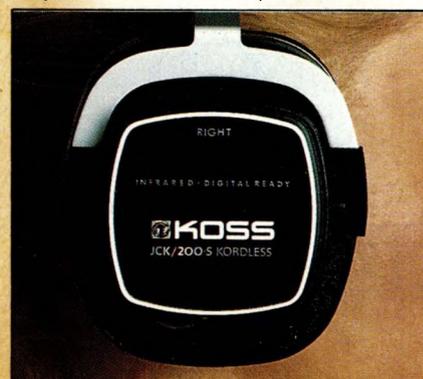
## Koss Music Pals

For today's active listener on-the-go, Koss presents the Music Pals. These ultra-lightweight models fit directly in the ear for a secure, comfortable fit that's perfect for bicyclists, joggers and other music lovers on the move. Complete with a range of accessories.



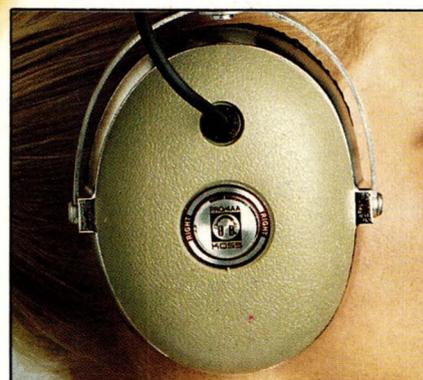
## Koss Prolite

Using Neodymium magnets, the Prolites provide remarkable high magnetic flux density without adding to their lightweight portability. The high-powered motor drives the diaphragm at incredibly high speeds while remaining low in distortion. Special temporal pad design redirects the pressure away from the ear to the temple.



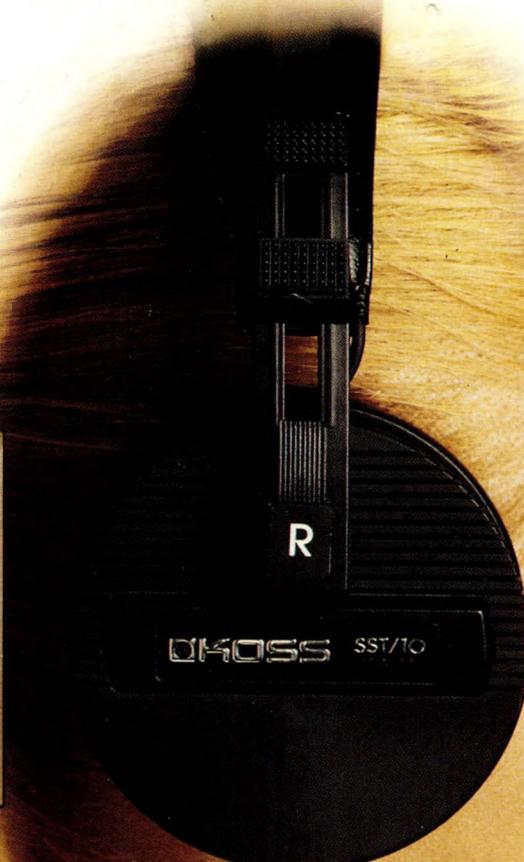
## Koss Kordless

Koss Kordless combine the finest in headphone design with the latest in infrared technology. Now, listen to your favourite CD's, audio or video tapes, even TV broadcasts with complete freedom. And because it's Koss, you get full frequency response and high-output capability.



## Koss Professionals

Studio and broadcast professionals, as well as other discriminating audiophiles have long preferred the full frequency, deep bass sound of Koss' professional headphones. Foam-filled earcushions totally isolate the listener from distracting outside sounds and irritating feedback.



# KOSS

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

Please send me full details on the full range of Koss headphones, to HW International, 3-5 Eden Grove, London N7 8EQ.

Name \_\_\_\_\_ Address \_\_\_\_\_ Post Code \_\_\_\_\_

# HI-FI CHOICE

ISSUE NUMBER 67: FEBRUARY 1989



Cover photograph of the Audio Technica AT-F3/OC (see page 107) by Chris Richardson.

## THE FRONT END

7

### UPDATE

Read all about it – news of products, technological advances and activity within the industry.

16

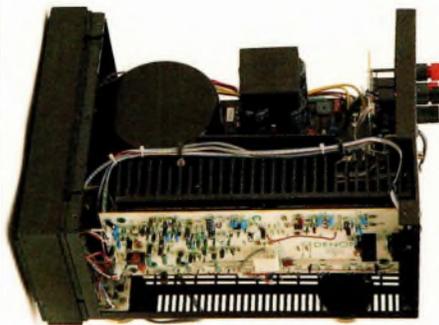
### AND THE SHOW GOES ON . . .

Our fearless reporter travels to Belfast to bring back tales of audio blarney.

18

### CHOICE SESSIONS

Jason Kennedy investigates Pirate high mass speaker stands; and the Ed waxes lyrical about Denon POA 6600 power amps, Wolstenholme modifications, and gets blasted with Sony MegaBass.



25

### READERS WRITE/CHOICE ANSWERS

Your views, ideas and queries are sliced and diced by audio agony aunt Jason K.

44

### DMP COMPACT DISC OFFER

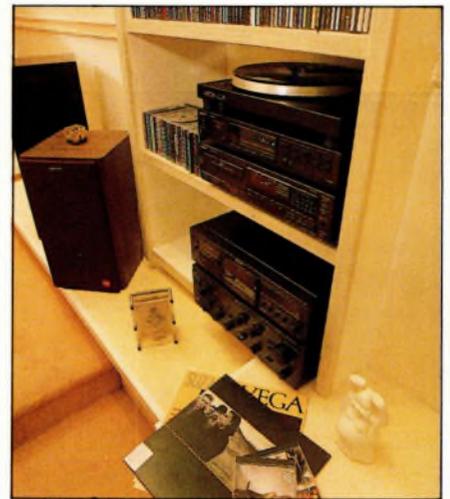
Absolute Sounds is distributing the DMP audiophile range of Jazz CDs. *Hi-Fi Choice* offers you the chance to get your hands on these and save a fiver!

## ASPIRATIONS

28

### THE HOUSE THAT GAZ BUILT

Pseudo East Ender Dan Houston has a butchers around Gary Davies's gaff, and finds it wired for sound.

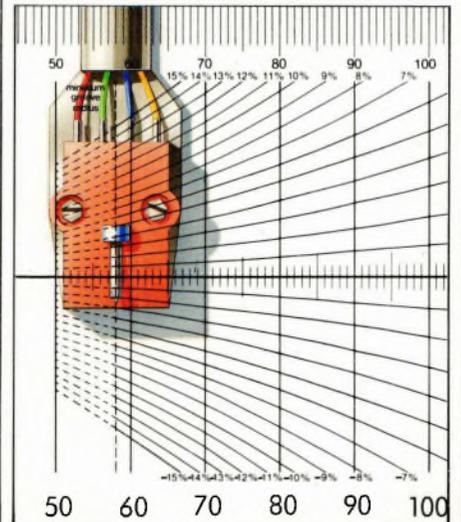


## FREE GIFT

35

### FINE TUNING

To get the best possible sound from your record player it's important to minimise cartridge tracking error. We explain how to use the Elite Alignment Gauge **FREE** with this issue.



## TURNTABLES & TONEARMS



# 46

### MARKET RESPONSE

DH parries with the sharp end of the audio industry and gets the lowdown on sales, failures and successes of the turntable market.

# 49

### CHOOSING AND USING TURNTABLES AND TONEARMS

Nearly six years into the digital age people still buy turntables. Alvin Gold unravels the vinyl myth.

# 51

### TURNTABLE AND TONEARM REVIEWS

The insatiable Alvin Gold gets his teeth into the latest crop of transcription devices.

# 99

### TECH TALK

For buffs only, an explanation of the lab tests and technical procedures used in the reviews.

# 101

### CONCLUSIONS, BEST BUYS AND RECOMMENDATIONS

The hard line according to Alvin Gold.

## CARTRIDGES

# 103

### CHOOSING AND USING CARTRIDGES

Needletalk from Paul Miller.

# 105

### CARTRIDGE REVIEWS

On the bench and in the arm, 20 cartridges tested by PM.

## THE DIRECTORY

# 124

### SELECTED DEALER DIRECTORY

Regional dealer listing for serious hi-fi in your area.

# 130

### THE CHOICE DIRECTORY

The definitive audio list – comment, technical info and prices for all the equipment we've reviewed.

INTEGRATED TURNTABLES		
NAME	LAB SOUND	COMMENTS
Acoustic Research EB101	Good	This genuine high fidelity product offers an impressive
Alphason Solo Xenon MCS	Average +	The deck is warm and euphonious with high levels of
Alphason Solo Xenon MCS	Good	audible.
Alphason Sonata HR-100S-MCS	Excellent	Highly capable audiophile system with real resolution,
Ariston Q-Deck	Very Good	ability and speed.
Ariston R060	Good	Well engineered and good sounding, low cost package.
Ariston R060	Average +	With the Ergon arm, this balanced and communicative
Ariston R060	Good	R060 on sound quality.
Ariston R060	Good	Heavy on engineering, short of soul? The Forte aims
Ariston R060	Below Average	residual pitch variations and a lack of bass power.
Ariston R060	Average	

## CHOICE MATTERS

# 15

### COMING UP

Next month we review 30 affordable amplifiers, Aspirations visits a stately pile in the Cotswolds and JK brakes for some high end in-car sounds.

# 168

### PERSONAL MESSAGES

Paul Messenger delves into the future of radio broadcasting.

## MENU

Newcomers to the confusing world of audio can be forgiven for assuming that if it's hi-fi sound you want, then a compact disc player *must* be what you should buy. Such is the power of massive advertising campaigns – not to mention the influence of radio disc jockeys who seem constantly to extol the "crystal clear sound" of the CDs they play in the studio.

Truth is, once you progress beyond the realms of the average stacking or midi system life just isn't that simple. Good old-fashioned vinyl long playing records can still give CDs a run for their money in the sound quality stakes. In fact many music lovers (and I include myself here) maintain that CD still has some way to go before matching the naturalness of sound available from a top quality record player. Not all hi-fi commentators agree on this mind you, nor do they agree on which turntable provides the most accurate sound. Consequently the usual advice applies when shopping for a high quality record player on which you play those precious LPs: listen for yourselves and let your own ears be the judge.

The great thing about CD, of course, is it's so gloriously simple and foolproof. Not so record players, which need careful setting up if they're to give of their best. Doubtless many of you are listening to turntables on which the arm and cartridge are way out of alignment, so you'll find this month's FREE Elite Alignment Gauge an invaluable aid to making sure you're getting the best possible performance from your deck. Don't be put off by the instructions (page 35); they may look intimidating at first glance, but read them through and you'll see that the whole procedure is logical and straightforward. Care and patience is all that's needed to ensure that distortion errors are minimised.

Next month our attentions are focused on amplifiers, the 'heart' of the hi-fi system, plus we'll be testing some high quality in-car front-ends and power amplifiers. And following on from the loudspeaker tests we ran last month, we'll also be publishing reviews of ten more speakers, including models as diverse as the Toshiba SS33M (£90) and Celestion SL600Si (£700).

John Bamford

EDITOR: John Bamford, CONSULTANT EDITOR: Paul Messenger, ASSISTANT EDITOR: Jane Hadley, STAFF WRITERS: Daniel Houston, Jason Kennedy, CONTRIBUTORS: Alvin Gold, Paul Miller, DESIGN CONSULTANT: David Whelan, ART DIRECTOR: Kerry Gormley, ASSISTANT ADVERTISEMENT MANAGER: Lawrence Merritt, ADVERTISEMENT EXECUTIVE: Cindy Forde, ADVERTISEMENT PRODUCTION MANAGER: Clare Leggett, ADVERTISEMENT DIRECTOR: Alistair Ramsey, PRODUCTION MANAGER: Judith Middleton, MARKETING MANAGER: Bryan Denyer, CIRCULATION EXECUTIVE: Katrina Edmonson, PHOTOGRAPHY: Chris Richardson, COVER PHOTOGRAPHY: Chris Richardson, PUBLISHER: Marianne McNicholas, 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. Telex: 8954139 DENNIS G. 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.

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 them. 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 © 1989, Felden productions.

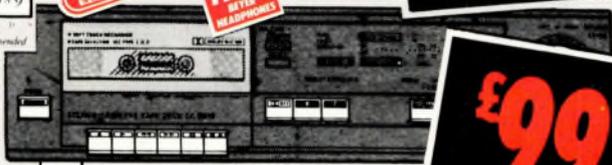


PUBLICATION

# CLASSICS!

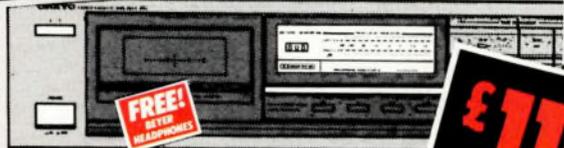


Highly Commended



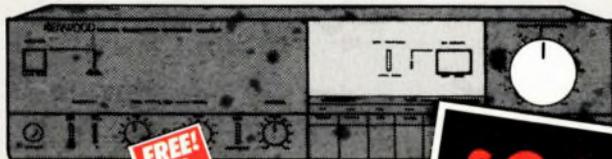
**DUAL CC8010 Cassette Deck** •Dolby™ B&C NR •Excellent heads •New range from Dual •Black finish •Metal •Soft Touch controls •440 x 117 x 245.

£99



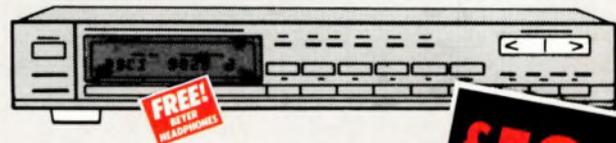
**ONKYO TA2120 Cassette Deck** •Dolby™ B&C NR •2 x 7 segment peak level meters •Computer controlled full logic tape transport •Black finish •Auto tape select •2 mode repeat function •435 x 116 x 264

£119



**KENWOOD KA550 Amplifier** •40 watts per channel •Low impedance drive capability •Independent CD input •Subsonic filter •Black finish •420 x 113 x 311.

£99

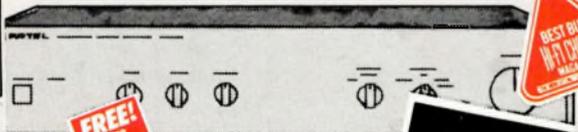


**KENWOOD KT660L Tuner** •LW/MW/FM •Digital •Timer •20 presets •Quartz synthesized •Black finish •440 x 65 x 251.

£129



Highly Commended



**ROTEL RA810A Amplifier** •New range model with impressive performance •20 wpc output •Highly praised by critics •Specially designed phono input •444 x 86 x 303

£99



**ARISTON Q-DECK Turntable** •What Hi-Fi turntable of the Year 1988 •Semi-automatic belt drive •Electronic speed change •Cart £5 extra.

£144



**DUAL CS 503-I Turntable** •Semi auto •Belt drive •DC motor •Black finish •440 x 115 x 363. •Cart £5 extra.

£114



**DUAL CD1030RC Compact Disc** •Digital readout •Full remote control •16 bit 2x oversampling •Hi speed linear transport •Black •430 x 90 x 290.

£169

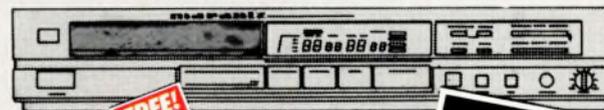


Highly Commended



**NAD 3020E Amplifier** •20wpc •Total Harmonic distortion 0.02% •Black finish •Freq Resp 20Hz-20kHz •S/N 84dB •420 x 91 x 270

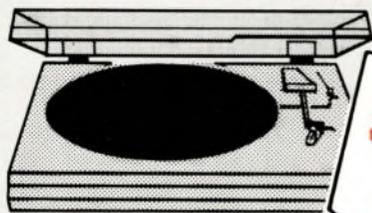
£119



**MARANTZ CD65 II Compact Disc** •16 bit 4 x oversampling •Digital display •3 separate power supplies •Di-cast laser sep. •Black finish •420 x 90 x 300.

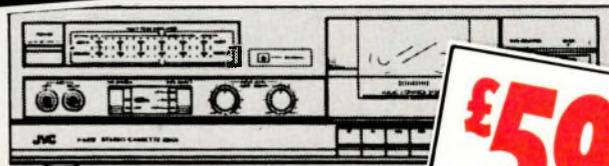
£249

## BARGAINS!



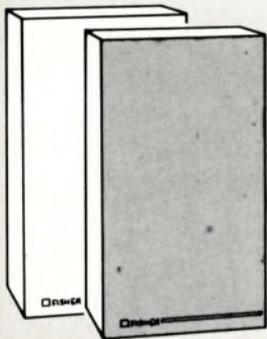
£29

**TENSAI TS705 Turntable** ●Belt drive ●Auto return ●Stop button ●Black finish ●Cart £5 extra.



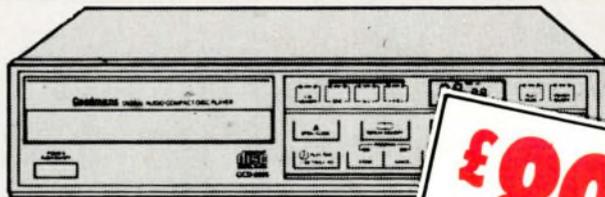
£59

**JVC TDX102 Cassette Deck** ●Dolby B NR ●S/N 58dB ●Crosstalk (1kHz) 60dB ●Freq resp 40Hz-15KHz ●Black finish ●Metal ●435 x 115 x 237 (Also TDX202 £89.95)



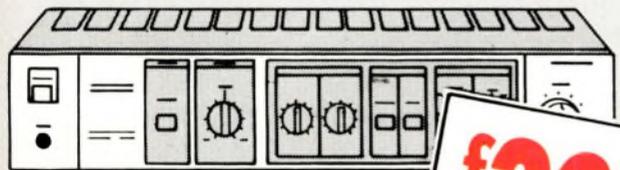
**FISHER STEM48 Speakers** ●Impedance 8ohms ●25 watts power handling ●Black finish ●2-way infinite baffle ●W190 x H370 x D205

£29  
Pair



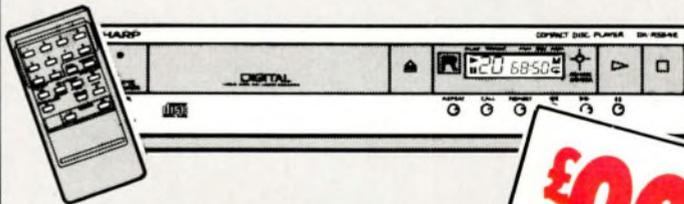
£89

**GOODMANS GCD500S Compact Disc** ●LED digital display ●Music search ●Fast forward/rev ●Black finish ●Repeat/memory function ●350 x 80 x 310



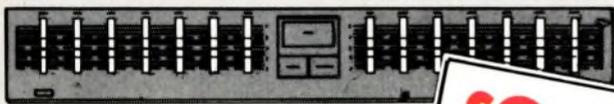
£39

**SANYO JA220 Amplifier** ●20 watts per channel ●THD 0.9% ●Freq resp 20Hz-20,000Hz ●Silver/black finish ●420 x 80 x 220



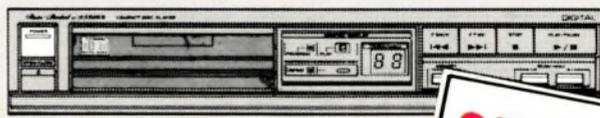
£99

**SHARP DXR554 Compact Disc** ●Digital display ●20 random programme memory ●Infra red remote control ●16 bit linear ●365 x 83 x 365



£39

**SANSUI SE1000 Equaliser** ●7 bands per channel ●12dB cut/boost ●Black finish ●Source/tape, line 1 & 2 selectors ●430 x 78 x 210.



£119

**FISHER AD924 Compact Disc** ●Digital display ●16 random programme memory ●Pause mode ●16 bit linear ●Black finish

### WHERE TO FIND US...

**BIRMINGHAM:** 10 Smallbrook Queensway, B5 4EN Tel: 021 643 1516 In front of the Albany Hotel on main ring road. Open 9-6pm Mon-Sat. Late night Thurs til 7pm.  
**BRISTOL:** 20 Cotham Hill, BS6 6LF Tel: 0272 734397 50 yards Clifton Down Shopping Centre. Opposite 'Crockers' Pub. Open 10-7pm Mon-Frid. 9-6pm Sats.  
**CARDIFF:** 5 Central Square, CF1 1EP Tel: 0222 383311 Near the Train and Bus Station. Open 9-6pm Mon-Sats. Late night Thurs til 7pm.  
**EDINBURGH:** 1b Chambers Street, EH1 1HR Tel: 031 226 3544 Near the Royal Scottish Museum. Open 10-6pm Mon-Frid. 9-5pm Sats. Late night Thurs til 7pm. 12-4pm Suns. 11th & 18th Dec.  
**GLASGOW:** 24 Gordon Street, G1 3PU Tel: 041 221 9147 Near the Central Station. Open 9-6pm Mon-Frid. 10-6pm Sats. Late night Thurs til 7pm. 12-4pm Suns. 11th & 18th Dec.  
**LEEDS:** 55 The Headrow, LS1 6LR Tel: 0532 455717 Opposite Lewis's Department Store. Open 9-6pm Mon-Sats. Late night Thurs til 7pm.  
**LIVERPOOL:** 69B Church Street, L1 1DN Tel: 051 708 7484 Corner of Parker Street. Open 9-6pm Mon-Sat. Late night Thurs til 7pm.

**LONDON:** 2 London Bridge Walk, SE1 2SX Tel: 01 403 1201 (10 Lines) 01 403 4710 On the Walkway (not in A-Z) over Duke St. Hill. (not on street level) Open 10-7pm Mon-Fri. 10-5pm Sats.  
**STOCKPORT:** 4 Wellington Street, SK1 3RN Tel: 061 480 1700 100 yards Stockport Station (opposite Station Approach) 10 yards off the A6. Open 9-6pm Mon-Frid. 9-5pm Sats. Late night Weds til 7pm.  
**YORK:** 6 Feasegate, YO1 2SQ Tel: 0904 645535 30 yards St Sampson Square. Open 9-6pm Mon-Sat. Late night Thurs til 7pm.

We Welcome Access, Visa, Cheques and Part Exchange. Also VAT export (handling charge £2.50). All goods brand new in sealed boxes unless otherwise stated, inc. VAT, and guaranteed 1 year. Factory Repack is a new item or mail order return which has been opened, used briefly or demonstrated, then tested and resealed by the official importer with a full as-new guarantee. E&OE. All stores have a clearance corner full of ex-display & secondhand bargains and browsers are definitely welcome! Please, phone 061 480 1700 (24hrs) for FREE monthly 24 page price list and hi-fi guide.

*play it  
again  
sam  
and  
again  
and...*



...when it comes to music, nobody plays it better than Yamaha.

Sit back, relax and enjoy the dynamic, natural sound of a Yamaha

cassette deck. Engineered to the highest standards, the Yamaha

range of hi-fi cassette decks offers something for everyone –

professional 3-head systems, auto-reverse decks, twin-tape

machines plus advanced features like Play Trim and Dolby HX Pro\*

Dynamic Bias Servo – and much more. Plus they're all RS remote

control compatible – in harmony with the rest of your Yamaha

system. So whether you're buying your first cassette deck or

reaching for new heights of excellence, choose a

Yamaha – they're music, naturally.

For further information and the name

of your nearest Yamaha dealer, contact us at the address below.



*music  
naturally*

**100** **YAMAHA HIFI**  
YAMAHA 1887-1987

Yamaha Electronics (UK) Limited, Yamaha House, 200 Rickmansworth Road,  
Watford, Herts WD1 7JS. Tel. Watford (0923) 33166

\*Dolby HX Pro is a trademark of Dolby Laboratory Licensing Corporation



## BUSINESS CAMBRIDGE BOUGHT OUT OF TROUBLE

Cambridge Audio, the company reported in receivership last month, has been bought by the Watford based Hi-Fi Markets Group. The transaction took place keeping most of the Cambridge workforce intact with work at the St Ives factory

"It's the crowning of ten years' achievement," he opined. "All credit should go to Alan Sinfield, our financial director; he really did out-negotiate everyone in the field." Giles continued that the group would now be looking to the European market and 1992 in a "big way".

Cambridge had been trading with a deficit of £160,000 at the time the receiver was called on November 11. HFM did not buy

all controls are remote handset duplicated. The back panel bristles with phono sockets – pairs for accepting and sending analogue stereo audio backed with singletons for digital bitstream and video signals. And there's no fewer than three Scart/Peritel 21-pin Euroconnectors for direct TV baseband interconnection.

The surround sound feature has a choice of eight different pre-set simulated acoustics, and can be programmed with four more to taste. The ability to "access, edit dub and record" from up to fifteen separate A/V sources should satisfy even the most hardened gadget addict until well past the end of the century. But the complete absence of the word 'music' in four pages of press release is surely indicative of less than purist hi-fi priorities.

£1,350 promise better drive units and smoother 'piano type' finish. According to Andy Wood, for Distributors HW International, the finish will overcome a British prejudice against concrete. "The



Avance Pyramide 150

attitude is: 'if it ain't in a teak box it's no good', so they're finished in black or white with a high-gloss varnish," he said.

The cheapest of the new speakers – the £390 *Pyramide 150* illustrated above – could be described as an upmarket bookshelf version of the established *Avance 120* while maintaining its space-age styling.



The CD2 lives on.

continuing. Stan Curtis, the former Chairman of Cambridge jailed in September for fraud and burglary, was reported to be rejoining the company as a designer in the "early months" of 1989. The new Chairman of the company is Malcolm Blockley – Hi-Fi Markets' boss.

No-one would be drawn to publicly state the buying price for Cambridge (an accountancy source put it "between £450,000 and \$550,000") but apparently the Markets' bid was not the highest for the firm. However, the receiver, Mark Palios, of Arthur Young Chartered Accountants in Cambridge, told *Choice*: "In my experience it is one of the best outcomes I have seen. It just goes to show the company's problems weren't too big and centred around the fact that Stan Curtis' imprisonment had caused a loss of confidence in the company."

Hi-Fi Markets, who imports the NAD, Onkyo, Sansui and Boston brands in the UK, beat off competition from several other British and Japanese Audio brands including Celestion and Wharfedale. Andy Giles, for HFM, said the ten-years-old group had always been ambitious to acquire a British manufacturing base.

the debt but according to Andy Giles, the deal has meant that creditors will get "75 per cent minimum" of their money back. However the 3i group, who owned around 30 per cent of the company were not envisaging much of a return. Tim Murphett, of the Cambridge regional office said: "We'll lose around £150,000 – but it's gone to a good home; Hi-Fi Markets is another customer of ours!"

## PRODUCTS CHANDELIER SWINGING

Toshiba's new £700 *XB-1000* integrated amplifier is stuffed to the gills with every feature anyone's ever likely to want.

Described as a 'digital A/V amplifier', it provides four channels, each of 50W, and a 16-bit surround sound digital synthesiser/processor. There's an on-board DAC system for handling digital PCM signals directly, in addition to more analogue inputs and outputs than can be counted conveniently on fingers and toes.

The front panel is neatly laid out and logically ordered, considering the complexity, and

## NEW AVANCE

The new range of Danish *Avance* concrete-case loudspeakers has been launched in the UK. Four models priced between £390 and



Widget fanciers will discover a willing bedfellow with Toshiba's XB-1000. And, above, just why its backside needs all that cushioning.



## THE BABY ROCK IS CHRISTENED

After a period of identity crisis Max Townshend's latest platter spinning creation has settled down to the name of *Avalon*, which is certainly more Arthurian and memorable than TI5 or Townshend *MkV*. Max's search for a name led him to run a competition at last year's Penta Show. The winner, Desmond Mitchell, one of six to suggest *Avalon*, received his prize of the new turntable at the launch held at Auditions in Chelsea last November.

In its final form the *Avalon* features the silicone trough and record clamp of the *Rock* and is

which allow the user to 'create' a live atmosphere for music in different settings in the living room.

There are also 12 memory locations enabling a user to change the preset environment to his or her taste. Another natty feature is the TV screen link which allows you to see what you're doing from your armchair. Previously the settings were only displayed on the machine (*DSP1*) itself. Yamaha has not included the semi-professional option of using the *DSP100* with a keyboard or guitar say, so users who want to play or record their own music in a 'live' setting will still have to buy the *DSP1*.

Yamaha has also launched a



*Now the party's over; they're calling baby Rock Avalon.*

likewise supplied arm-less. Unusual features include a PVC platter and semi-electronic motor drive which uses high torque to get the platter running but reverts to low torque thereafter in order to reduce motor induced vibration. Price has stabilised at £299.

Townshend International, Unit 2, North Weylands Ind. Est., Molesley Road, Walton on Thames, Surrey, KT12 3PL. Tel: (0932) 246850.

## ARMCHAIR FRIENDLY

Yamaha has produced a new, cheaper version of its digital soundfield processor, aimed specifically for the domestic market. The processor, mentioned a couple of times in our recent show reports, was available in early December. At £400 the *DSP100* slashes £250 off the price of the *DSP1* – a pioneering unit in surround-sound technology – but keeps the same number of field settings and options of its forerunner. These comprise 12 preset environments (such as 'Church')

new four-channel power amplifier – the £170 *MX35* which is designed to drive the necessary four speakers for surround sound. However, the *DSP100* has a master volume control which means it can be used with an integrated amplifier.



*Not a mother-in-law's shooting stick but Tannoy's loudspeaker stands*

## ROCKIN' NEW TUNER FROM H-K

Harman Kardon has launched the first of a new range of tuners in the shape of the *TU909*. Retailing at £199 it replaces the *TU911* and features 'rocker' tuning control in place of the conventional rotating knob. This is a bit of a novelty, but only reflects the fickleness of the market. Unlike the *TU911* the new model has both FM and AM

wavebands and will remember 12 preset stations on the former and six on the latter. The *TU909* should be in the shops by the time you read this. Harman UK, Mill Street, Slough, Berks SL2 5DD. Tel: (0753) 76911.

## INNOVATIVE STANDS FROM TANNOY

Tannoy has produced some attractive new speaker stands. Made from cast and extruded alloy, these high tech single



*Digital soundfield processing, Yamaha-style, now costs less.*

column stands are not only theoretically very effective but also prove that speaker stands need not be ugly.

The triangular base is made from cast zinc alloy and threaded for three spikes, whilst the triangular section upright is an aluminium extrusion which has an internal channel to hide your speaker cable. Also supplied is a plastic bag which can be filled with sand/lead in order to damp the stand and increase mass. They have a regular square top plate which is tapped for spikes but Blu-tack is supplied as part of the package.

Named the TS250, 400 and 500 (the numbers referring to height in millimetres), the stands cost from £60 to £70 and are supplied in a black textured finish.

## ALPHA RESTYLE

A&R has tarted up its Arcam Alpha amplifier and tuner to give a more suave and sophisticated image so as to match the Delta range. Dubbed the Series 2 they are now wider and slimmer and constructed in black extruded aluminium. What's more, they incorporate a number of minor upgrades to flexibility and sound quality. Those on the amplifier include an improved toroidal



transformer, the ability to accept a moving coil board and an IEC mains socket; factors which should make it a more impressive beast than the Alpha + it replaces. The cost penalty is a mere £10, bringing the price up to £160. The Alpha tuner has also undergone tweaking but remains the same price (£150), and apparently the original tuner will remain in production for another four to six months to enable Alpha + owners to purchase a tuner which matches visually with their existing amplifier. Which just goes to show that what people have said about A&R caring about their customers is absolutely true. Nice one!



High-end Trojan horse? Watch and hear the valves shine after dark.

## ORGAN TROUBLE?

Ross is touting its new £10 headphones as a way to avoid domestic disharmony. The RE-2323 stereo cans are specifically designed to be used with the likes of a home organ – something Ross obviously considers as contributing to the divorce rate. The company claims its lightweight supra-aural headphones allow “budding maestros” their freedom with “crystal clear sound reproduction”, and will not wake

up babies.

The “answer-to-a-housewife’s-prayer” RE2323s come with over a metre of cable and small and large jack plugs – so you can use them in your walk-things or domestic amplifier as well.

## MEATY NEW MONOBLOK FROM RADFORD

Woodside Electronics, the company behind Radford amplifiers, has produced a new 50watt monoblok valve amplifier. An ultralinear class A design, the MA50 is styled in the traditional Radford fashion, but has had a lot of work done on the front-end power supply which Woodside claims significantly improves performance. The MA50 will retail for just over a ‘grand’ and the units should be in the shops by the time we go to press. Woodside has also launched a revised version of the Tristar T90 loudspeaker which will sell for \$661 and features double binding posts for bi-wiring. Woodside Electronics, Kimberly Road, Clevedon, Avon, BS21 6QJ. Tel: (0272) 877611.

## BEARD MUSCLES IN

With the new P1000 stereo power amplifier Beard looks set to muscle in on the high-end amplifier market. The new all-valve amplifier has a nominal power rating of 100watts per channel into four or eight ohms, the twelve 6550 triode connected output tubes delivering 50watts in class A switching to A/B with significant impedance drops.

The P1000 uses low levels of negative feedback with a circuit rating of 18dB. Apparently signal paths have been kept as short as possible and hardwired where feasible. The asking price for this degree of analogue audio gratification is ‘a snip’ at £2,495.

## SOCKET TO ME

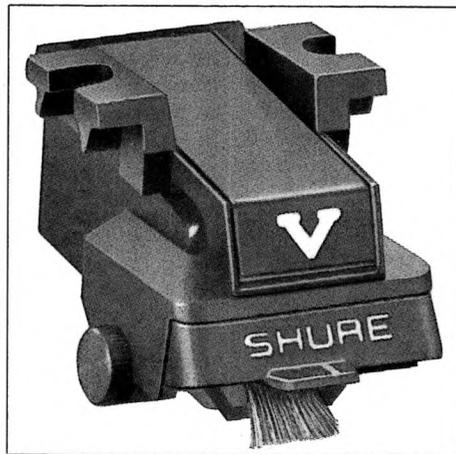
The latest variation of the multi-room entertainment theme is MGM’s Plugaround sound. Launched in November by International Media Communications, the system uses mains wiring and plug sockets to transmit audio signals to pairs of speakers in any room. The system uses an encoder which takes the signal from the ‘tape-out’ or headphone socket of an amplifier and transmits it via the mains to remote speakers anywhere in the house. This means the signal will be carried on solid core cable alongside the 240 volt/50Hz mains current – thus bringing new meaning to the term ‘electric sounds’. Each pair of speakers is made up of one passive and one active enclosure (only in America!), the latter having a built in 10watt amplifier and volume control which drives both speakers. The speakers themselves are a full range single unit reflex design and the package of encoder and speakers will retail for £199. Extra pairs of loudspeakers will cost £140. IMC Plc, 8 Woods Mews, London W1Y 3AM. Tel: (01) 629 6006.

*Yes the audio industry does employ designers; some of their work is good (above).*

*Find out how clean your mains is: plugaround with MGM.*



# At last a worthy competitor for the Shure V15



## The New Shure VST V incorporating V15 Series Technology

At a time when most companies are raising the price of their top-end cartridges, Shure are bringing theirs down. The latest advances in design and technology have enabled Shure to introduce a new cartridge incorporating many of the legendary innovations of the V15 at a considerably lower price.

The unique Beryllium MICROWALL Stylus shank delivers incredibly accurate high frequency trackability with the lowest effective mass, resulting in significantly less record and stylus wear. And the Micro-Ridge Tip reduces



distortion to an absolute minimum without increasing groove wall wear. In addition the VST V features Shure's exclusive dynamic stabiliser allowing warped records to be played, and a side-guard system to prevent accidental damage and prolong stylus life.

A new cartridge is the most significant improvement you can make to enhance the sound of a system and you can depend on Shure, the recognised leader in cartridge design and development, to bring you the ultimate cartridge at an affordable price.

# SHURE®

For further details on Shure VST Cartridges contact:

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

HFC 12

## NEW ICE FROM NAKAMICHI

Nakamichi's in-car range has now been extended to include an integrated radio/cassette player. The £499 *RD-450* is said to feature the usual Nakamichi attention to sound quality, but at a considerable saving over the company's existing separate front end/power amp combos.

The *RD-450* offers 12W stereo output and 18 tuner presets, and unusually it has an input socket for a portable CD player. The cassette mechanism is auto-reverse and features both Dolby B and C noise reduction. Its styling is a little less hard-edged than Nakamichi's other players and more in line with current trends (ie well tasty). Car Audio Consultants, 141, Greyhound Road, London W6 8NJ. Tel: (01) 381 5174.



## NICAM READY S-VHS FROM MITSUBISHI

Mitsubishi is now marketing its *HS-B70* S-VHS videorecorder which can receive NICAM stereo broadcasts (handy if and when they materialise). The S-VHS format is said to offer a 70 per cent improvement in picture resolution to 400 lines. The long play *HS-B70* features twin digital



tracking, one for normal replay/record and one for frame control. This is said to ensure accurate tracking of both picture and sound.

Full on-screen operating and programming graphics are also provided and the unit has a flying erase head and audio dub for A/V editing. The price of this inspiring piece of hardware is a penny less than £1K.

## JBL'S TITANIUM TLX

JBL has launched a new *TLX* range of loudspeakers. The five new models feature pure titanium dome tweeters which replace the vapour-deposited tweeters of the original range. Prices for this, JBL's 'entry level' range, start at £149 for the two-way *TLX12* and rise to £449 for the *TLX20* - a floor-standing four-way design with twin 250mm bass units.

*Hot ICE from Nakamichi's first integrated radio cassette player.*

*Ready and waiting: Mitsubishi's stereo S-VHS video recorder.*

## BUSINESS

### CREEK TO GO MAINSTREAM

Amplifier and tuner maker Creek Audio Systems has been bought by TGI group member Mordaunt-Short. The move was described by both sides as "wholly amicable" and allows Creek access to the financial muscle of the TGI group while Mordaunt-Short gets a "talented amplifier designer".

Mike Creek, who will continue to operate from his North London base, said he would be designing three of four amplifiers (priced between £180 and £400-ish) and two tuners for Mordaunt-Short while continuing on his own projects. The latter include the new Creek *5050* amplifier due for launch in February and a three waveband tuner in June.

The Creek takeover is similar to Mordaunt-Short's acquisition of Epos Acoustics last autumn and looks like part of a TGI (originally Tannoy, Goodmans and Mordaunt-Short) trend to incorporate talent without stifling the diversity of British audio design.

### AWARDS DEALT OUT

Specialist dealers from up and down the land recently gathered in London's Cafe Royale for lunch and the *Sony/Hi-Fi News Dealer Awards*. Eight regional winners, a national Dealer of the Year and Sony's own ES Dealer of the Year were presented with their prizes by Capital Radio's Chris Tarrant.

The National Dealer of the Year Award was won by AT Labs which has shops in Enfield, Gants Hill and West Hampstead in the London area. Regional awards went to: Audio Excellence - Cardiff; The Audiofile - Bishops Stortford, Herts; Audio Projects - Leeds; Audio T - London; The Music Room - Manchester; Hampshire Audio - Chandlers Ford; Reading Hi-Fi - Reading; Robert Ritchie - Montrose, Scotland. Sony's ES award went to BATS Sony Centre of Birmingham.

### CD RECORDING

The fact that DAT (digital audio tape) is still stuck in political limbo, besieged by copyright pressure groups, has given the next generation technology of record-capable CD-style optical discs a chance to catch up.

Many major Japanese consumer electronics companies have reportedly developed systems capable either of once only recordings (WORM) or of

recording and erasing many times on a single disc - to the point (and price) where commercialisation is now feasible, possibly starting in 1989. Details of compatibility with CD (and CD-V) are not yet known, though it is likely that playing times will be half those of equivalent pre-recorded CDs.

Whether CD-R and CD-E will be any more successful than DAT in a world saturated with conventional compact cassette recorders, players and tapes will depend on the price and compatibility of the new formats.

### CHEAPER CDs

Major US music label WEA's decision to cut the price of its major CD releases to \$8.9 - compared to the \$10-13 charged by other leading labels - is the first positive sign of the price cuts that have been expected since supply moved ahead of demand at the beginning of 1988.

A WEA spokesman quoted in ERT magazine admitted that CDs have hitherto been slightly overpriced, and that sales have fallen short of expectations, while expressing optimism that the price cuts would boost sales volumes. Should the new price points become established, CD hardware sales are bound to be stimulated in consequence.

### IN BRIEF

AT Labs has opened its fourth new hi-fi store. The new store is at 173-175 Station Road, Edgware, Middlesex HA8 7JX. Tel: (01) 952 5535.

Quad has produced a protection circuit for its original electrostatic loudspeakers. Based on a new type of zener diode it limits the maximum voltage that can be fed to the HF panel of the speaker, however it only functions for short term peaks and will fail if consistently overdriven. It can be fitted by Quad or one of its dealers at the cost of about £50 a pair.

Aston Audio is holding three musical evenings dedicated to individual brands, starting with Alphason on Tuesday January 31, Quad on Monday February 27 and Absolute Sounds on Monday April 3. These will be held at the Stanneylands Hotel, Wilmslow, Cheshire. Tickets can be obtained from Aston Audio on (0625) 582704.

The North East has a new hi-fi store in the form of Newcastle Hi-Fi, 153 Kenton Road, Gosforth, Newcastle-upon-Tyne. Tel: (091) 285 7179.

Your ears tell you it's British, your eyes tell you it's not. Which do you trust?

A dilemma facing any discerning hi-fi buff when hearing our ES separates for the first time.



This unnerving experience should be blamed on the team of top British audio engineers and consultants who helped us develop our ES range.

For Sony to use the best hi-fi specialists in the World (the British), to satisfy the most demanding hi-fi enthusiasts

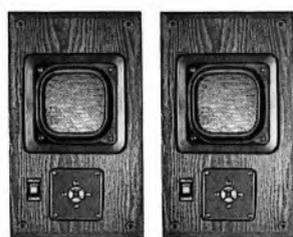
in the World (the British), is cheating you might say.

Maybe. But there's definitely no cheating on what goes into our equipment.

Both the CD player and the amplifier featured for example, have Gibraltar chassis. (Rock solid bases that keep vibration and magnetic interference to an absolute minimum.)



Both have 18-bit linear converters with eight-times oversampling. (To save you looking through reams of competitive specifications, that's the



APM 12 ES

best there is.) In fact, we've gone to extraordinary lengths to keep sound signals pure.

The CD player is copper shielded, its loading tray acoustically sealed. The tape deck is divided

into three compartments (all shielded), with equal weight distributed on each foot to reduce vibration. The tuner (What Hi-Fi 'Tuner of the Year' Award 1989) has AM circuitry specifically designed for the UK's medium and long wave bands.



STS 700 ES

Lastly, the loudspeakers have titanium tweeters to improve treble and a reflex design for more accurate bass.

**IF IT WASN'T FOR ONE SMALL DETAIL  
YOU'D THINK OUR  
HI-FI SEPARATES WERE BRITISH.**

All these measures would be pointless, though, if you skimmed on cable. We don't.

Our phono leads have gold plated connectors to improve the flow, and we spot weld them onto the cable (instead of using 'sound tarnishing' soldering like some people).

Both phono and speaker cables are made of linear crystal, oxygen free copper. They offer a lack of resistance so negligible that unless you accidentally trip over them, you'll forget they're even there.



TAF 450 ES

To hear some pure, unadulterated sound, have a listen to Sony ES separates at one of the dealers overleaf. And remember. Their origins may be Japanese, but their pedigree is essentially British.

**SONY ES**





# OUND OF EXPERIENCE



Memorex expertise has produced a range of quality hi-fi products to enhance every type of music, from rock to opera to a classical concerto. So whether it's the ultimate in headphones you want, or the best in audio tapes, you know Memorex has the answer. For a complete range of audio and video accessories with the level of performance you expect, choose Memorex.

## MEMOREX<sup>®</sup>

— hear the sound of experience.

# DON'T MISS NEXT MONTH'S ISSUE OF

# HI-FI CHOICE

## PACKED WITH IN-DEPTH REVIEWS!



## 30 AMPLIFIERS ON TEST

Including the latest from  
**LINN, ION, NVA,**  
and many others.

Our Market Survey investigates the  
dealers' views on the current state of  
the Amplifier market

PLUS . . .

JASON KENNEDY LOOKS AT HIGH-END ICE  
AND PAUL MESSENGER REVIEWS  
10 LOUDSPEAKERS.

PLUS . . .

NEWS, VIEWS, AND MUCH, MUCH MORE.

# HI-FI CHOICE

MARCH ISSUE ON SALE FEBRUARY 10th

## ES SEPARATE STOCKISTS.

**London:** Atlantic Electronics, 295-297 High Road, Willesden

Doug Brady Hi-Fi, 18 Monmouth Street, Covent Garden

Covent Garden Records, 84 Charing Cross Road

Harrods Ltd., Knightsbridge, Brompton Road

Massey Radio, 117 Chiswick High Road, Chiswick

Nicholls Hi-Fi, 430-434 Lee High Road

PNR AudioVision, 28 Tottenham Court Road

H.L. Smith, 287 Edgware Road

Sound Sense, 350 Edgware Road

Welbeck Video Plc., 26 Tottenham Court Road

**Southern England:** Absolute Sound & Video Ltd., 4 Feather Lane, Basingstoke, Hants

Basildon Sony Centre, Unit 46, Eastgate Int Shop Ctr., Basildon, Essex

Bexleyheath Sony Centre, 118 Broadway, Bexleyheath, Kent

Bournemouth Sony Centre, Westover Road, Bournemouth, Dorset

Bowers & Wilkins Ltd., 1 Beckett Buildings, Littlehampton Road, Worthing, Sussex

Bromley Sony Centre, 32 The Mall, High Street, Bromley, Kent

Chew & Osborne Ltd., 148 High Street, Epping, Essex

W Darby & Co., Lockey House, St. Peters Street, St. Albans, Herts

Dawson Radio Ltd., 23 Seamoor Road, Westbourne, Bournemouth, Dorset

Gerald F. Giles, 32-36 Rose Lane, Norwich, Norfolk

High Wycombe Sony Centre, 7 High Street, High Wycombe, Bucks

Holman Radio & Television, 3 King Street, Wimbome, Dorset

Jeffries Hi-Fi, 4 Albert Parade, Green Street, Eastbourne, East Sussex

Merrow Ltd., 21/22 Tunsgate, Guildford, Surrey

Merrow Sound Ltd., 34 West Street, Horsham, Sussex

Norwich Sony Centre, St. Stevens Way, Norwich, Norfolk

Sonance Ltd., 553 Ivybridge Shopping Centre, Isleworth, Middx

Spalding Electrical Ltd., 352-354 Lower Adiscombe Road, Croydon, Surrey

The Audio File, 27A Hockerill Street, Bishops Stortford, Herts

Tru-Fi Sound & Vision Ltd., 2 Central Parade, London Road, Redhill, Surrey

Unitel Products Ltd., Compton House, 35 High Street, New Malden, Surrey

**South West England:** Absolute Sound & Video Ltd., 65 Park Street, Clifton, Bristol, Avon

Absolute Sound & Video Ltd., 42 Albion Street, Cheltenham, Glos

Absolute Sound & Video Ltd., 60 Fleet Street, Swindon, Wilts

Barnstable Sony Centre, Holland Walk, Barnstable, Devon

Bristol Sony Centre, 8-10 Bond Street, Broadmead, Bristol

Exeter Sony Centre, 15 Paris Street, Exeter, Devon

Paul Green Ltd., HiFi Harpers Furn, EL, London Road, Bath, Avon

Paul Lawrence, 100 Union Street, Torquay, Devon

R. Lewis & Co. Ltd., The Green, Stonehouse, Gloucestershire

Plymouth Sony Centre, 20 Armada Centre, Armada Way, Plymouth, Devon

**Midlands:** Absolute Sound & Video Ltd., 19 Old High Street, Headington, Oxford.

Absolute Sound & Video Ltd., 256 Banbury Road, Summertown, Oxford

James Beatlie Ltd., Victoria Street, Wolverhampton

Birmingham Sony Centre, 160-162 Corporation Street, Birmingham

Chew & Osborne Ltd., 26 King Street, Saffron Walden, Cambridge

Derby Sony Centre, 2c Albert Street, Derby

High Grade HiFi, 297 Wellingborough Road, Northampton

Horns, 6 South Parade, Oxford, Oxon

Kings Radio (Hereford) Ltd., 35 Widemarsh Street, Hereford, Herefordshire

Leamington Spa Sony Centre, 3 Regent Grove, Leamington Spa, Warwickshire

Mansfield Sony Centre, 14 Queen Street, Mansfield, Nottinghamshire

Northampton Sony Centre, 771 Abington Street, Northampton, Northants

Sounds Expensive, 12 Regent Street, Rugby, Warwickshire

University Audio, 1 & 2 Peas Hill, Cambridge, Cambs

**Northern England:** Ball Brothers Entis Ltd., 15 Bacup Road, Rawtenstall, Lancs

Bennell Superstore, 136 Shields Road, Byker, Newcastle-upon-Tyne, Tyne & Wear

Bradford Sony Centre, Ericks, Rawson Square, Bradford, W. Ycrks.

Doug Brady Hi-Fi, 15A Kingway, Warrington, Cheshire

R.F. Lang, 30 Knowsley Street, Bolton, Lancs

R.F. Lang, 6 Compton Street, Wigan, Lancs

Leeds Sony Centre, Jones of Oakwood, 103 Vicar Lane, Leeds, West Yorkshire

Lintone Audio Ltd., 7-11 Park Lane, Gateshead, Tyne & Wear

Manchester Sony Centre, R.N. Clearstone Ltd., 66/68 Bridge Street, Manchester

P & A Audio, 98 Liverpool Road, Crosby, Liverpool, Merseyside

Peters Electrical Ltd., 24 St. Michaels Square, Chester, Cheshire

Peters Electrical Ltd., 8 High Street, Bromborough, Wirral, Merseyside

Peters HiFi of Chester, 11 St. Werburgh Square, Grange Precinct, Birkenhead, Merseyside

Preston Sony Centre, 98-100 Fishergate Walk, St. Georges Precinct, Preston, Lancashire

Searle Audio, 223-225 Rawlinson Street, Barrow-in-Furness, Cumbria

The Transistor Centre (Wilmslow), Hi-Fi Centre, Green Lane, Wilmslow, Cheshire

Wakefield Sony Centre, 3-5 Cross Square, Wakefield, W. Yorkshire

**Scotland:** Dundee Sony Centre, 18 Union Street, Dundee

Edinburgh Sony Centre, 165 Bonnington Road, Edinburgh

Perth Sony Centre, 38 South Methuen Street, Perth

Graham Robertson, 5 Fountain Road, Bridge of Allan, Stirlingshire

David Stevens HiFi, 1-3 Main Street, The Village, E. Kilbride, Lanarkshire

SONY ES



# AND THE SHOW GOES ON . . .

*Jason Kennedy visits the Emerald Isle to report on unprecedented audio activity in Belfast.*

At the end of October last year Belfast's Stormont Hotel was host to the Zeus Audio hi-fi show, the first such event to hit Northern Ireland for at least nine years. Situated in the shadow of the Northern Ireland parliament and Tom King's house, or castle as it's more usually described, the Stormont Hotel proved a capable site for what turned out to be a well attended show – on the manufacturers behalf, at least. There were 43 companies represented in about half as many rooms, which made for an entertaining variety of systems, including several new names.

Perhaps the most interesting discovery was to be found in the Audio Dimensions room – a relatively new Irish company which manufactures a range of speaker stands that were to be seen all around the show and varied between skinny and stocky but always heavy. Prices are very reasonable and they even custom build stands to order. The company distributes the Lantana range of loudspeakers from the States. Superficially these resemble ProAcs but have some interesting design features including the *laminar-flow vent* which is a variation on the reflex port described by Lantana as a "linear pressure release valve". The drivers are also somewhat unusual in that they are coated in a cellulose resin that makes them look almost muddy. Whatever the reasons, the sounds emanating from them were quite impressive, which undoubtedly had something to do with a component further back in the system, namely the Klyne SK-5A – a very nicely made American high-end preamp that Audio Dimensions distributes in the UK. It is the more expensive of two solid state preamps and will retail for £2,990, whilst its equally impressive brother the SK-6 will cost £1,500. Both feature extremely neat internal and external construction and the SK-5A has adjustable gain for low output MCs.

As if all this weren't enough, Audio Dimensions was promoting another new product – the Shan *Shimna*, a small home grown loudspeaker which resembles the *QLN* but employs a cement composite cabinet, said to offer considerably more rigidity than *Medite*. They have partnering stands made in the same material and the combination of the two makes a loudspeaker that simply 'disappears', leaving a large and tactile soundstage – and this in a crowded hotel room. The *Shimnas*, in the



*Neat internals on the Klyne SK-5A.*



*Not the re-emergence of the trough line but Aragon's 4004 power amp.*

shops soon, retail for £279 plus stands.

A more familiar name that I came across was Audio Innovations who managed to dem its *First Audio Amplifier* monoblocks for a whole three hours, before reverting to prototypes of future products in order to shake the Stormont's foundations with a selection of discs designed to show off the low frequency capabilities of the set-up. Yellow's *The Race* proved to be particularly successful at spreading 100Hz around the hotel. You'd be sitting in the Oracle/Rowland/Infinity room for instance, listening to some opera, and this belch of very low frequency sound would appear, totally out of sync with what was playing! This, in no small part, was due to the remarkable *Voyd Reference* turntable which was leaving no stone unturned in its transcription of Peter Qvortrup's weird and wonderful record collection.



*The Shan Shimna on the left and two of the Lantanas.*

At the other end of the building Path was making very sweet sounds with its Stilton bodied *ATF3* on a *Xerxes* feeding Sonus Faber *Electas* via the stylish Aragon amplifiers. This is a range of amplifiers designed by Krell's Dan D'Agostino and featuring distinctive 'V' notch styling. There is one preamp and two power amps priced in the £1-£2K region. Opposite, Roksan was surprising the locals with the remarkable imaging of the notorious *Darius* speakers, even when perching precariously on rather small stands. Roksan had brought along some of the Isoda cable which it will be distributing and using in its tonearm and loudspeakers.

Other product that I hadn't come across before included the Allison range of loudspeakers. Allison is an American company recently purchased by ex-AR employees (Roy Allison who founded the company 15 years ago also originated from AR). Allison's new *CD* range contains four models, of which all but one feature the characteristic upward facing bass or mid/bass units and forward firing convex diaphragm tweeters. It's an interesting and very nicely finished range that starts at £270 for the 'bookshelf' *CD6* model.

New on the vinyl front is the *Rebel* from See Ltd, which looks very similar to the standard *Revolver* but features a less glamorous arm and cartridge and is sold as a package for £160.

Perhaps one of the most noticeable products was the Tralfamadore *DFX2* pre/power amp combination, a new Northern Irish product that looks like yet another beefy combo, but is distinguished by its blue enamel control knobs and very stylish graphics. A daring variation on the norm, retailing for about £1,000 for the pair, they are targeted as real hi-fi for yuppies.

There were, of course, many other companies at the show including Presence Audio with its tasty *Cadence* valve amps, Pink Triangle whose turntables were unusually prolific, and Oxford Acoustics, EAR and Alphason all making healthy sonic contributions to the general melee.

Which just about wraps up the Belfast show for this year, but one can't conclude without mentioning the superhuman effort put in by the folk from Zeus Audio. David Campbell and George McCague, along with the likes of the dynamic Diane Dempsey made the Belfast show a personal and enjoyable event that I for one look forward to attending again.

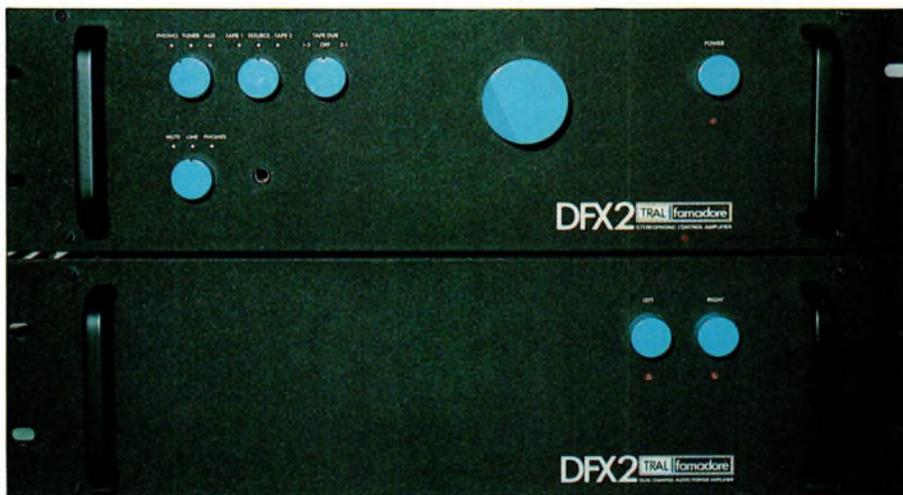


*A loudspeaker called Allison.*



*Revolver's new budget package, the Rebel.*

*Black and blue from Tralfamadore.*



*La belle Cadence.*





# CHOICE SESSIONS

*Things we hear . . . This month, an 'audiophile' ghetto blaster from Sony; sweet-sounding monoblok power amplifiers from Denon; Pirate loudspeaker stands, and Avondale Audio's amplifier upgrades.*

## OUT OF THE GHETTO

*Sony's CFD-D75 CD Yuppie Blaster might well be described as the first 'audiophile' portable. John Bamford has been trying it out on the move.*

'Mega Bass' from a portable ghetto blaster might seem like an impossible claim. Perhaps 'Some Bass' might have been a safer slogan for Sony to use – though I doubt the company's marketing department could ever be persuaded to my way of thinking.

But to put things in proportion, the bass output from the *CFD-D75* is nothing short of extraordinary. £350 is a lot to pay for a portable radio sure enough, even if it does include an auto-reverse cassette deck and compact disc player, but on hearing the *D75* it's clear that the sound is in another league compared to the majority of the genre. The 8cm Mega Bass woofer is housed in the rear of the unit, and the sound ducted through to vents either side of the main speakers. I'm not sure what Sony is up to here; it sounds like the bass is out of phase with the main signal for added effect – but it sure is impressive.

Bass level can be altered to taste by a slider control on the top panel, along with 'tone' via three sliders nominally labelled 400Hz, 2kHz and 10kHz. Their action is extremely severe, your best bet being to set the thing up as near 'flat' as you can bear and leave well alone.

Overall the build quality and 'feel' of the controls is excellent, totally in keeping with a flagship product. Soft touch solenoids control all transport and programming functions for the CD player and tape deck, while a clear and uncluttered liquid crystal display gives

readout of status or time. The *D75* includes a built-in clock timer allowing you to make recordings of radio programmes while you're out for the day (or night); also it can be used as a straightforward alarm clock/radio.

Accepting that in the real world many consumers will want to listen to CDs at home and copy them onto tape for listening on personal cassette players or in the car (how many of us can afford in-car CD players?), Sony has made the task of 'dubbing' CDs gloriously simple. The tape transport is synchronised with the CD player to allow 'one touch start' when making recordings, it permits continuous copying on both sides of the tape, and the machine's brain even susses when a track on the CD has been broken halfway through, goes back to the beginning of the song and obligingly records it again.

But for all this, the designers of the *D75* have made what appear to be one or two strange compromises – and compromises which cannot be dismissed as necessities to keep pricing competitive. After all, there's nothing very 'competitive' about a £350 price ticket. First, there's no mono button, which does mean that if you're unfortunate enough to live in weak signal areas you cannot remove the noise from FM stereo reception. Surely this would have been more useful than the arguably superfluous balance control which is fitted? And in trying to be all things to all men, the *D75* includes a microphone input – yet the line output which allows you to hook up the machine to a hi-fi system is a line output from the CD player only. So you can listen to CDs through a high quality amplifier and pair of loudspeakers, but you can't play tapes or listen to the radio. I said the compromises were curious ones . . .

Still, the sound brings back fond memories

of Hacker table top radio sets, in that it's rich and homogeneous and eminently listenable. The Sony *D75* is a real 'audiophile' portable, if you like, and quite unlike the run-of-the-mill cheap radio/cassette recorders that seem to plague our lives in the 'eighties. The sound is powerful too, and just what's needed for music making when away from home on holiday.

I would also make a strong case for the *D75* to owners of midi systems who might be considering adding a CD player to their music gear. Admittedly it won't look as neat as a domestic CD player which could be racked up with an existing system, and neither is the *D75* a cheap option. (Indeed, £350 buys a very respectable CD player these days, one which can be used in all but the most esoteric hi-fi systems.) But in any system costing less than, say, £1,500 the *D75* will prove perfectly good enough – and for the extra cost over a budget domestic CD player you do get the portability and the bonus of the cassette deck, radio and timer.

## SOLID BLOCKS

*John Bamford tracks down a rare species: a high-end super-amp from Japan with an affordable price tag.*

Denon's *POA-6600* monoblok amplifiers were tested in *Choice* in last July's *Collection* issue. Since then they've established something of a cult status in the UK – aided in no small part by their extreme rarity – as it seems that everyone who has heard them has been extremely impressed by their performance.

It's not easy getting listeners from different areas of the hi-fi industry to agree on what makes a good amplifier. Walk around a hi-fi exhibition checking out the demonstrations put on by numerous loudspeaker manufacturers, for example, and you'll find a whole host of different amps being used as each manufacturer attempts to get the best possible sound out of its speakers. SD Acoustics will use Croft amplifiers; Townshend Audio Research (EAR); Celestion opt for Audio Research; KEF usually choose big Musical Fidelities (though these days they'll doubtless use Meridians, seeing as they now own the company); and so on . . .

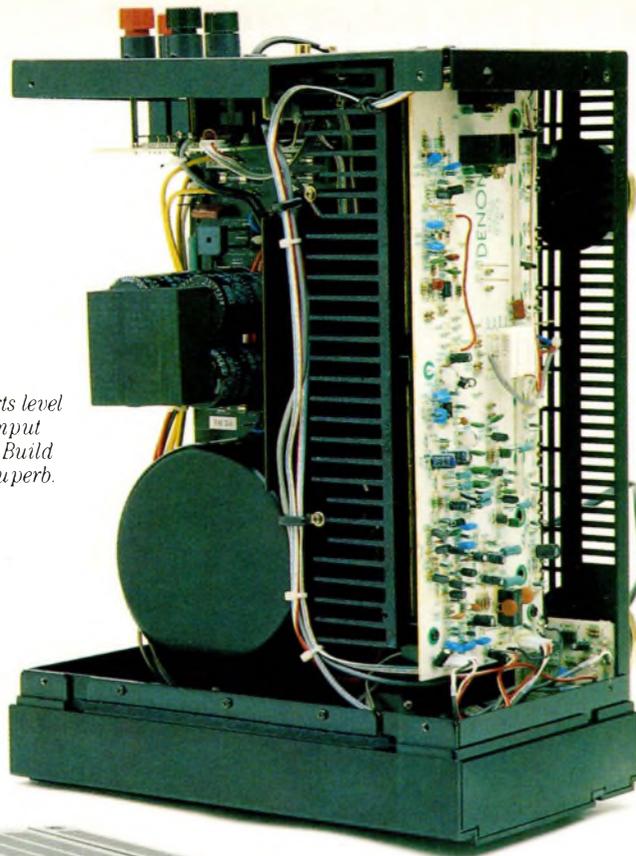
The point is, although few manufacturers can ever be persuaded to agree on anything, no-one I've spoken to has ever had an unkind word to say about the Denon *POA-6600* monobloks. Consequently I've been eager to get my hands on a pair of these rare beasts to see what it is that makes them so special.

Denon is not a name we associate in the UK with high quality amplification; the *POA-6600s* are Denon's current flagship amplifiers



*Sony CFD-D75: not just run-of-the-mill.*

POA-6600's front panel sports level control, normal/balanced input and A/B speaker switching. Build quality, inside and out, is superb.



priced at £1,000 per pair. There's an £850 preamp to go with them too, we understand, an impressively specified unit with on-board DACs. However, it's unlikely to make much of an impression in the current UK climate as it has no phono stage.

A quick glance at the '6600s is all that's needed to see that value for money is exceptionally high. Build quality inside and out is first class, each mono amplifier including a very substantial toroid transformer and 40,000µF of smoothing capacitors, high quality components, and a choice of normal (phono) or balanced (canon) inputs. Power output is specified at a massive 240W into 8ohm, 450W into 4ohm. Still, it's not the 'power' of the amplifiers which grabs the attention, more the sweet and relaxed sound which displays good stereo perspectives and a very refined treble quality.

The '6600s do go loud, but pushing them hard into a pair of ATC SCM-50 loudspeakers showed that the amplifiers could soon run out of steam. This was heard as a distinct blurring in the bass at high listening levels – presumably as the power supplies ran out of steam. We've explained before in *Choice* that power output figures are largely meaningless; to reinforce this I can report that the Denons proved capable of going only marginally louder than a pair of Audio Innovations valve monoblocks rated at a meagre 15watts!

With the 6600s there is a sense of ease and

'authority' as if the amps have a firm grip on the music – but don't think of these amplifiers in terms of muscle, think more of smooth, cool refinement. That's really what the '6600s are all about. And at £1,000 for the pair you're getting a very smart package.

## ROCK STEADY

*Jason Kennedy investigates the effects of hernia-inducing speaker stands on the sound of his system.*

Through considerable experimentation and hard listening, Rob Dowse of Brighton's Definitive Audio came to the conclusion that if a loudspeaker is to be able to accurately transduce the signal sent by the amplifier, it must be supported by a stand as inert and solid as possible. The principle behind the Pirate stands is that because the relatively large section steel tubing is damped with sand and lead it will not ring at audible frequencies; and because of their substantial mass they effectively resist the attempts of the speaker cabinet to move with the drivers. Open frame stands are also capable of doing this if they are given a nice big footprint, but this increases the amount of ringing and flexible material being used, as well as being domestically inconvenient. Pirate stands are intended to allow the character of the speaker to be heard in all its naked glory.

The Pirate models borrowed are made specifically for the Snell J11 loudspeakers I use and dubbed 'J4-Leg', describing their vocation and type quite effectively. The J4-Leg is a 54cm high four column stand with a 23x33cm (the exact dimensions of the J11 base) square top and bottom plates, only the latter is threaded for spikes. The £219 price is quite high but given the raw materials involved and the cost of transporting them, let alone the sonic benefits, it doesn't seem so unreasonable. It's also worth bearing in mind that £219 represents less than ten per cent of the average Snell J11 based system.

Once the herculean task of installing the stands and adjusting the four carpet piercing spikes had been achieved, the Snells were firmly attached to the top plate using Blu-tak at each corner. Then came the daunting task of assessing whether the Pirates really offered any advantage over the Foundations I'd previously been using. However, from the outset this proved to be an easy job. Usually stands of a similar type have much the same effect on the speakers they are supporting but the extra mass and rigidity of the Pirates brought the sort of improvements in coherence of presentation that one might expect of a front end upgrade.

Individual notes became more tangible and instrumental separation improved to quite an uncanny extent. Bass notes gained solidity and power and treble notes gained clarity and precision. Unexpected results indeed, for what is apparently a mere doubling of stand weight. I guess four columns are inherently more stable than two and that the extra mass really does hold the cabinet firmly, absorbing energy and giving the drivers a less active reference point to work from.

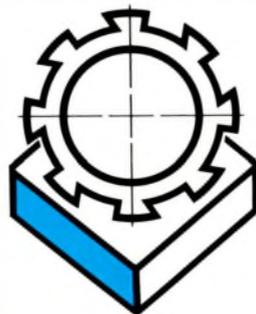
Further listening proved they were allowing the speakers to resolve more information than had previously been apparent, extra nuance and intonation turning up on familiar tracks. Even imaging was further stabilised, an effect which this combination of amp and speakers are loathe to display but one that turns up quite impressively on some discs. Tonally, there doesn't seem to be much change, bass becomes more powerful and tight but not necessarily deeper whilst the loss of treble sibilance has a tendency to make the sound less open but more accurate.

These positive results were noticed in the context of a wooden floored room. It's possible that results would be different with a concrete floor as the spikes would rest on top rather than embed themselves in it, which means that energy would be reflected rather than absorbed. The sonic consequences are hard to predict but the nature of the stand would probably be made more obvious. It would be interesting to experiment but the weight of the Pirates dissuades one from lugging them about too much and the nearest concrete floor that I have access to is 50 miles away.

All in all the J4-Leg stands managed to improve the sound of a \$3k system, specifically in the area of clarity and tightness of presentation, which is no mean feat at the price. If you have faith in the ability of your system and thus can afford to hear more of what it's passing to your speakers, then have a listen to the high mass approach.

Pirate stands cost from £149 upwards and extra information can be had from Definitive Audio in Brighton. Tel: (0273) 672796.

**IF ROKSAN  
PRICED THEIR  
EQUIPMENT ON  
PERFORMANCE  
YOU WOULD  
NOT BE ABLE  
TO AFFORD IT !**



ROKSAN

JOIN THE COGNOSCENTI

*The outboard power supply upgrades the sound of an original Musical Fidelity The Preamp. Connection is via locking DIN plug (below).*

to his Meridian 101B preamp; and a friend of mine is over the moon with the improvement in sound quality Avondale brought to his Naim 110, a lovely little amplifier even before you start tweaking it with higher quality components. My friend has also had his PS Audio phono preamplifier 'breathed on' to good effect, and is looking forward to getting the silver wire and silver solder treatment to his matching passive volume control unit.

More recently the power supply to my Musical Fidelity *The Preamp* has been further beefed up, Avondale now providing a dual regulated power supply when carrying out the full modification programme – total price with full guarantee £207. Once again the improvements are clear to hear, in that the silences from what is already an extremely quiet moving coil phono stage now appear 'blacker' than ever, and images of musicians performing within the stereo soundstage are now more stable, better focused, and simply more believable. My *The Preamp* doesn't have quite the transparency and 'open' sound of some of the more esoteric, highly priced valve amplifiers I've had the pleasure to listen to recently, but whenever review equipment has to be returned to its manufacturer (as inevitably it does, such is a reviewer's lot), it's never anything less than a pleasure to go back to what I now regard as my 'reliable workhorse' which always delivers the goods.

These days it's a smooth, confident and unflagging sound which emerges from my MF preamp, totally lacking that phenomenon which we tend to describe as 'transistor glare' for want of better adjectives.

The next instalment, if Les is true to his word, should centre on the imminent arrival of an Avondale modified Quad 405 power amp to the *Choice* offices. Hopefully we'll report our findings in the not-too-distant future. Meanwhile, for further details of prices and services available, contact Avondale Audio at The Hollies, 2 Avondale Road, Chesterfield S40 4TF. Tel: (0246) 200096.

A final word on the hobbyist newsletter mentioned earlier. It's a quarterly publication called *Audio Conversions* and you'll find it fascinating reading if you're the kind of audio amateur who understands circuit diagrams and enjoys spending cold winter evenings slaving over a hot soldering iron. Recent articles include test methods for assessing components, building a turntable power supply, and star earthing techniques. An annual subscription costs £5. Write to David Rusby, Audio Conversions, Coley Lane Farm, Wentworth, Rotherham, S. Yorks S62 7SQ.

## TURBO CONVERSIONS

*Avondale Audio 'breathe on' electronics in much the same way as GTI Engineering improve Volkswagen Golfs. John Bamford has been test driving the results.*

Put yourself in my shoes. When a total stranger approaches you at a hi-fi show and suggests that if you cross his palm with silver he'll attack your amplifier with a soldering iron and improve its performance, it's human nature to be sceptical. And so I was.

That's how I first met Les Wolstenholme, who introduced himself as the proprietor of Avondale Audio, an audio modification and design business based in Chesterfield. It was two years ago, in fact, at the Penta hi-fi Show, since when Les has proved the worth of his endeavours by dramatically improving the sound of an original Musical Fidelity *The Preamp* which I'd put into semi-retirement. It wasn't that the preamp was past it, simply that I'd been made aware of its shortcomings (most seriously, its tendency to sound hard and relentless) having had hands-on experience with too many superior products during the course of reviewing.

What caused me to consent to Les Wolstenholme ripping my preamp apart most of all was his claim that for less than £200 he could lift the sound to something approaching true high-end performance, the kind of performance which otherwise could only be obtained by lashing out on something very expensive. That's the trouble when you reach this kind of level of audio performance. If you want a preamp that's maybe a little bit more transparent, a little more refined, it's going to cost at least £500. And if you want something whose performance is *substantially* better you can reckon on the best part of £1,000 disappearing from your bank balance. Whichever way you look at it, that's a lot of records.

Also taking into consideration the fact that my preamp was fast approaching old age and well beyond its guarantee period, I reckoned I'd nothing to lose in handing it over for a major heart transplant. I had it on good authority that Wolstenholme's credentials were good; this was not a case of someone

declaring themselves an 'electronics expert' simply because they'd just learnt which end of a soldering iron gets hot. Wolstenholme has some recent Sugden amplifier designs to his credit, he has worked on projects with Guy Adams of Voyd Turntables fame, and as I discovered more recently he is a regular contributor (along with Graham Nalty of Audiokits) to a hobbyist newsletter which is edited and published by David Rusby, proprietor of Lynwood Electronics.

To cut a long story short, Les literally transformed the sound of my preamp by upgrading the phono integrated circuit with high quality discrete components, dispensing with the on-board transformer and power supply, and building a much beefier outboard supply into a separate box. (Admittedly it's a somewhat utilitarian looking box, but the idea is you can hide it out of sight.) The outboard supply connects to the preamp via a generous length of cable and high quality DIN plug with locking collar.

All this happened a year or so ago, at which point I reported on the results in another hi-fi magazine and caused Les a few sleepless nights. He was, I understand, literally flooded with enquiries from audio enthusiasts looking for ways to upgrade their systems without breaking the bank. Avondale Audio has been working flat out since then. Meanwhile I've yet to hear any tales of woe from disappointed patrons.

Regular readers may recall a letter from a *Choice* reader published recently praising Avondale Audio for the improvements made

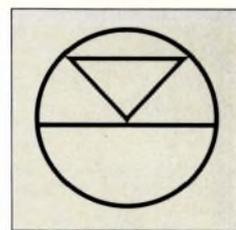


HEAR THE DIFFERENCE Choosing hi-fi is child's play. All you have to do is choose the one that sounds better than another – it is better. End of story. Now we are pleased to let you hear Linn equipment and compare the sound with other



**MOST HI-FI SYSTEMS**

to do is listen. So forget the jargon, ignore the gimmicks;  
turn the page to find your nearest Linn Dealer. He will be  
systems. You'll find it ridiculously easy to hear the difference.



**LINN**  
HIGH FIDELITY  
YOU'VE NEVER HEARD IT  
SO GOOD.



**LINN HI-FI SYSTEM**

**HERE THE DIFFERENCE** The dealers listed on this page are, in our opinion, the most experienced and knowledgeable in the U.K. They all offer excellent demonstration facilities and carry a wide range of systems at a wide range of prices. Linn dealers will give you sound advice and time to listen, so don't be afraid of a hard sell or a lot of gobbledegook.

**S C O T L A N D**

**ABERDEEN**  
HOLBURN HI-FI LTD\*  
445 HOLBORN STREET 0224-585713

**EDINBURGH**  
RUSS ANDREWS HI-FI\*  
34 NORTHUMBERLAND ST, 031-557 1672

**GLASGOW**  
STEREO STEREO  
278 ST VINCENT STREET 041-248 4079

**MONTROSE**  
ROBERT RITCHIE,\* 102 MURRAY STREET  
0674-73765



**WIRRAL**  
PETERS HI-FI, 8 HIGH STREET  
BROMBOROUGH 051-334 1874

**YORK**  
SOUND ORGANISATION,\* 16 GILLYGATE  
0904-627108

**C E N T R A L  
E N G L A N D**

**BIRMINGHAM**  
SOUND ADVICE,\* 162 ALCESTER ROAD  
MOSELEY 021-449 3328

GRIFFIN AUDIO,\* 94 BRISTOL STREET  
021-692 1359

**CAMBRIDGE**  
CAM AUDIO, 110 MILL RD. 0223-60442

**COVENTRY**  
FRANK HARVEY, 163 SPON ST, 0203-525200

**GREAT YARMOUTH**  
MARTINS HI-FI,\* 2 BROAD ROW  
0493-855044

**KING'S LYNN**  
MARTINS HI-FI,\* 5 HIGH ST, 0553-761683

**LOUGHBOROUGH**  
SOUND ADVICE,\* THE SOUND FACTORY  
DUKE STREET 0509-218254

**MILTON KEYNES**  
AUDIO INSIGHT,\* 53 WOLVERTON ROAD  
STONEY SFORD 0908-561551

**NORTHAMPTON**  
LISTEN INN, 32A GOLD STREET 0604-37871

**NORWICH**  
BASICALLY SOUND, OLD SCHOOL  
BRACON ASH 0508-70829

MARTINS HI-FI,\* 85-91 BER STREET  
0603-627010

**NOTTINGHAM**  
NICK DAKIN, 45 RADFORD RD, 0602-783862

**PETERBOROUGH**  
STILTON AUDIO, 489 LINCOLN ROAD  
0733-558838

**ROYAL LEAMINGTON SPA**  
HI-FI EXPERIENCE,\* 49 PARK STREET  
0926-881500

**STAFFORD**  
MUSICAL APPROACH, 137A NEWPORT ROAD  
0785 55154

**SHREWSBURY**  
CREATIVE AUDIO, 9 DOGPOLE, 0743-241924

**STOKE-ON-TRENT**  
PURKISS HI-FI, 51-53 PICCADILLY, HANLEY  
0782-265010

**WOLVERHAMPTON**  
WARSTONES HI-FI, 54A WARSTONES ROAD  
PENN 0902-345114

CLEARTONE HI-FI, 39 VICTORIA STREET  
0902 772901

**WORCESTER**  
WEST MIDLANDS AUDIO  
158 OMBERSLEY ROAD 0905-58046

**S E N G L A N D**

**ASHFORD, KENT**  
PHOTOCRAFT HI-FI,\* 40 HIGH STREET  
0233-624441/2

**BASINGSTOKE**  
ABSOLUTE SOUND & VIDEO  
4 FEATHERS LANE, 0256-24311

**BISHOPS STORTFORD**  
THE AUDIO FILE,\* 40 HOCKERILL STREET  
0279-506576

**BRIGHTON**  
SOUNDWAVES (BRIGHTON), 1 YORK PLACE  
LONDON ROAD 0273-695776

JEFFRIES HI-FI,\* 69 LONDON ROAD  
0273-609431

**CHELMSFORD**  
RAYLEIGH HI-FI, 216 MOULSHAM STREET  
0245-265245

**CHICHESTER**  
CHICHESTER HI-FI,\* 40 LITTLE LONDON  
0243-776402

**COLCHESTER**  
PRO MUSICA, 6 VINEYARD ST, 0206-577519

**CROYDON**  
SPALDINGS,\* 352-354 LOWER ADDISCOMBE  
ROAD 01-654 1231

**EASTBOURNE**  
JEFFRIES HI-FI,\* 4 ALBERT PARADE  
GREEN STREET 0323-31336

**EDGWARE MIDDIX**  
AT LABS,\* 173-175 STATION ROAD  
01-952 5535

**ENFIELD MIDDIX**  
AT LABS,\* 159A CHASE SIDE 01-367 3132

**FARNBOROUGH HANTS**  
FARNBOROUGH HI-FI, 7 QUEENSMEAD  
0252-520146

**HARPENDEN**  
STUDIO 99,\* 82 HIGH STREET 05827-64246

**HARROW**  
HARROW AUDIO, 27 SPRINGFIELD ROAD  
01-863 0938

**HIGH WYCOMBE**  
SOUND GALLERY, 65 CASTLE STREET  
0494-31682

**ILFORD ESSEX**  
AT LABS,\* 442/444 CRANBROOK ROAD  
GANTS HILL 01-518 0915

**LONDON N1**  
GRAHAMS HI-FI\*  
86-88 PENTONVILLE ROAD 01-837 4412

**LONDON N7**  
BARTLETTS HI-FI, 175-177 HOLLOWAY ROAD  
01-607 2296

**LONDON NW1**  
HI-FI EXPERIENCE\*  
2/4 CAMDEN HIGH STREET 01-388 1300

**LONDON NW6**  
STUDIO 99,\* 81 FAIRFAX ROAD  
SWISS COTTAGE 01-624 8855

AUDIO T,\* 190 WEST END LANE  
WEST HAMPSTEAD 01-794 7848

**LONDON SE1**  
SOUND ORGANISATION,\* 1 CATHEDRAL ST,  
LONDON BRIDGE 01-403 2255

**LONDON SE13**  
BILLY VEE,\* 248 LEE HIGH ROAD, LEWISHAM  
01-318 5755

**LONDON SE19**  
AUDIO VENUE, 24 CHURCH ROAD  
CRYSTAL PALACE 01-771 7787

**LONDON SW11**  
RPM, 2 BURLAND ROAD OFF WEBBS ROAD  
01-585 0274

**LONDON SW19**  
O'BRIEN HI-FI, 95 HIGH STREET  
WIMBLEDON VILLAGE 01-946 1528

**LONDON W1**  
DOUG BRADY HI-FI, 18 MONMOUTH STREET  
COVENT GARDEN 01-379 4010

HI-FI EXPERIENCE,\* LION HOUSE, 227  
TOTTENHAM COURT ROAD 01-580 3535

K J LEISURESOUND,\* 26 NEW CAVENTISH  
STREET 01-486 8263

**LONDON WC1**  
HI-FI EXPERIENCE,\* 33/34 ALFRED PLACE,  
STORE STREET 01-631 4917

**NEW MALDEN**  
UNILET PRODUCTS, 35 HIGH STREET  
01-942 9567

**NEWBURY**  
NEWBURY AUDIO, 2 WEAVERS WALK  
NORTHBROOK STREET 0635 33929

**OXFORD**  
ABSOLUTE SOUND & VIDEO,\* 19 OLD HIGH  
STREET, HEADINGTON 0865-65961

ABSOLUTE SOUND & VIDEO,\* 256 BANBURY  
ROAD, SUMMERTOWN 0865-53072

WESTWOOD & MASON, 46 GEORGE STREET  
0865-247783

**RADLETT**  
RADLETT AUDIO, 141 WATLING STREET  
09276-6497

**RAYLEIGH ESSEX**  
RAYLEIGH HI-FI, 44A HIGH ST, 0268-779762

**READING**  
READING HI-FI,\* 5/6 HARRIS ARCADE  
FRIAR STREET 0734-585463

**TUNBRIDGE WELLS**  
TONBRIDGE HI-FI,\* 16 HIGH STREET  
0892-24677

**UXBRIDGE**  
UXBRIDGE AUDIO,\* 278 HIGH STREET  
0895-30404

**WINDSOR**  
RADFORD HI-FI,\* 43 KING EDWARD COURT  
0753-856931

**S . W . E N G L A N D**

**BATH**  
PAUL GREEN HI-FI,\* c/o HARPER  
FURNISHINGS, KENSINGTON SHOWROOMS,  
LONDON ROAD 0225-316197

RADFORD HI-FI,\* 12 JAMES STREET WEST  
0225-446245

**BOURNEMOUTH**  
SUTTONS HI-FI, 18 WESTOVER ROAD  
0202-25512

**BRISTOL**  
ABSOLUTE SOUND & VIDEO  
65 PARK STREET, CLIFTON 0272-264975

RADFORD, HI-FI,\* 52/54 GLOUCESTER ROAD  
0272-428247

**CHEL TENHAM**  
ABSOLUTE SOUND & VIDEO\*  
40/42 ALBION STREET 0242-583960

**EXETER**  
GULLIFORD HI-FI,\* 28 COWICK STREET  
ST THOMAS 0392-218895

**GLOUCESTER**  
AUDIO EXCELLENCE,\* 58 BRISTOL ROAD  
0452-300046

**PLYMOUTH**  
PETER RUSSELLS, 58 NEW GEORGE STREET  
0752-669511

**SOUTHAMPTON**  
HAMPSHIRE AUDIO, 8 HURSLEY ROAD  
CHANDLERS FORD 0703-252827

SOUND WAVES, 1 HOLBURY DROVE  
PRECINCT, HOLBURY 0703 899 131

**SWINDON**  
ABSOLUTE SOUND & VIDEO\*  
60 FLEET STREET 0793-38222

**TRURO CORNWALL**  
TRURO HI-FI ATETS, 25 KING ST 0872-79809

**YEOVIL SOMERSET**  
MIKE MANNING AUDIO, 110 MIDDLE STREET  
0935-79361

**W A L E S**

**CARDIFF**  
AUDIO EXCELLENCE,\* 134 CRWYS ROAD  
0222-228565

**LLANDUDNO**  
PETERS HI-FI, VICTORIA BUILDING  
MOSTYN AVE, CRAIG-Y-DON 0492-76788

**SWANSEA**  
AUDIO EXCELLENCE,\* 9 HIGH STREET  
0792-474608

**N . I R E L A N D**

**BELFAST**  
LYRIC HI-FI,\* 163 STRANMILLIS ROAD  
0232-381296

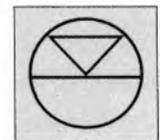
**I S L E O F M A N**

MANX AUDIO,\* GLEN VINE 0624-851437

**E I R E**

**DUBLIN**  
CLONEY AUDIO, 55 MAIN STREET  
BLACKROCK 889-449

\*Denotes Member or Associate Member of BADA  
(British Audio Dealers Association).



**LINN**  
HIGH FIDELITY  
YOU'VE NEVER HEARD IT  
SO GOOD.

For complete details on Linn equipment and the Linn difference, please telephone 041-644 5111 or write to Linn Products Ltd., Floors Road, Eaglesham, Glasgow G76 0EP and we'll send you a comprehensive information pack by return.



# READERS WRITE CHOICE ANSWERS

## PIONEERING SIGNAL TO NOISE

May I first congratulate you on a magazine which is becoming steadily more and more informative and interesting with each issue.

However, I feel that I must point out what I see as a fundamental error of logic displayed by one of the writers, Norman McLeod. It is an error that has been made by many people who are involved primarily in the production end (ie broadcast engineers, recording engineers etc) of the business. It is also the sort of error that the hi-fi press in general, for all their 'apparent lack of methodology and scientific rigour' no longer make. I refer to the explanation regarding the importance of excellence in the terms of signal to noise ratios quoted by a tuner manufacturer. (And, I presume in other areas such as distortion, separation etc.) Mr. McLeod's contention seems to be that because the BBC, and other broadcast operations, only specify a signal to noise ratio of 63dB, there is little point in a tuner being any better than this in its own performance. A little analysis of this statement will show it to be flawed.

What is being confused here is the relationship between the end result signal to noise ratio and the broadcast signal to noise ratio.

If the BBC manages 63dB, what we want to end up with is also 63dB. However, in order to achieve this, the tuner needs a figure, not of 63dB, but of infinity. That is, it should produce no noise of its own. As the state of the art stands at the moment, we cannot produce a totally noiseless tuner, and therefore we cannot reproduce the 63dB figure produced by the BBC. This does not mean of course, that we should not get as close as we can manage. We should not regard the tuner as a pint glass into which we only need to put a half pint of beer.

In hi-fi we are striving to make equipment which is totally transparent to the signal upon

which it is called to relay. Any errors in the signal which it is asked to reproduce should not be compounded by errors of its own. The same argument relates to the use of high quality cabling in hi-fi systems. The miles of bell wire which may be used in the production of the material has little to do with a domestic system which can only try to do its best with the signal it has: ie the record, the CD or the radio broadcast.

We have no choice but to treat the source we are given as the 100 per cent ideal, and thus we try to retain that 100 per cent in our reproduction equipment. This is surely the driving force behind all progress in the hi-fi field.

DOUG RANDALL,  
PIONEER HIGH FIDELITY (GB) LTD

*To be honest, I'm still pondering this one. Although agreeing wholeheartedly with your sentiments I can't help but also sympathise with the irrefutable logic of Norman's argument. Perhaps some of our readers would also like to air a point of view. Correspondence is warmly welcomed - Ed.*

### Norman's Reply:

*I am grateful to Mr. Randall for raising a very interesting point about signal to noise ratios.*

*Being a scholar as well as a gentleman, Mr. Randall will realise how complex the analysis of non-coherent noise in cascaded linear amplifying systems is, but I hope I can clarify my point with a simple analogy.*

*Have you ever come across a telephone answering machine which uses Dolby noise reduction? I haven't. No-one in their right mind would budget for Dolby in that context. Why? Because the S/N ratio of an unadorned tape path is nearly 50dB, and that is better than any telephone line known to BT. To spend customers' money on noise reduction would be to waste it.*

*As it is with the telephone, so it is with the wireless. All hi-fi tuners are heavily compromised compared to the £5,000+*

*professional receivers used in the broadcast industry. The secret of a good product is to spend money on things that are important.* Norman McLeod

## PATRIOTIC PURCHASES

I have used an Armstrong receiver for 15 years now, and the time has come to replace it. I refuse to purchase equipment manufactured in the Far East, and purchased your magazine expecting to discover which brands are made in the UK.

I am not a technical expert and all I require is a reliable instrument to enable me to listen to radio and records. The only British make I can identify in your magazine is Ion Systems, but no address is given. Can you supply me with the address and those of other British manufacturers? I expect to pay between £400 and £500 for an amplifier and tuner combination.

A. G. LILLIE,  
SHERBORNE, DORSET

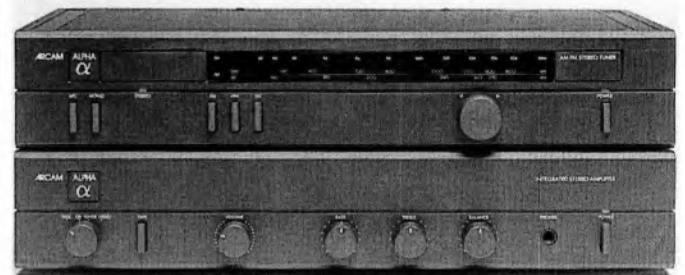
*and this still seems to be the domain of the Orientals. But several do build matching tuners, including Creek, A&R Cambridge and QED.*

*The address for Ion Systems is: Unit 28, Mochdre Ind. Est., Newton, Powys.*

## POWER HUNGRY

I have recently purchased a Rega Planar 3/Linn K5 as a reasonably priced upgrade for my five-year-old Dual 505, and I'm running it through a NAD 3020 and Mission 700s which are of the same vintage.

I am now looking to replace the amplifier and loudspeakers with something that will give me higher levels, and have a budget of £500-£600 including stands and cable. My musical tastes are pretty wide and since I have always enjoyed the relatively bright and forward sound of the Missions I would like something similar. I've listened to the Arcam Delta 60 and Denon 520



*A slick tuner/amp combo built in Cambridge by A&R.*

*There are quite a number of British amplifier manufacturers and their full addresses can be found in the issue of Choice in which their products have been reviewed. The following British companies produce good quality equipment that would suit your budget: A&R Cambridge, Audio Innovations, Audiolab, Cambridge Audio, Creek, Orell, Exposure, Inca Tech, ITL, Linn, Mission, Musical Fidelity, Naim, QED and, of course, Ion Systems.*

*And the list goes on. To find the appropriate reviews look for the back issue number in the Directory at the back of Hi-Fi Choice. However, none of the above manufacture receivers,*

*amps and Linn Helix and Mission 737 loudspeakers at a local shop, and found them to be an improvement on what I already have. However, I notice that the Choice Directory is somewhat derogatory about the A60 and the 737s and doesn't list the other two products, and I would be grateful for any advice or suggestions for alternatives.*

S. BOOTH,  
KINGS LYNN, NORFOLK

*P.S. Can you suggest an upgrade for the K5?*

*More power, huh? Well, you've got the budget for it so why not check out some of the meaty amps from the following*

selection: Audio Innovations Series 300, Inca Tech Claymore, Naim Nait 2 and Rotel RA870BX. All are capable of a healthy current output and have their own sonic characters, the Naim and Rotel being the more obviously powerful whilst the Audio Innovations valve amp is probably the most revealing.

Suitable partnering speakers can be had from the likes of Monitor Audio, specifically the 352/MD, JPW whose AP3 suits the above valve amp well, and Wharfedale whose new 505.2 looks set to become something of a giant slayer. For recommendations on stands and cables check out the Directory.

On the cartridge front there's plenty to choose from in this month's reviews. However, a sensible choice would be the Goldring 1040 which another reader has suggested makes the Planar 3 into an Axis competitor, and he could be right.

## FLEX

I was interested to read your comparison of speaker cables, and being an economically minded type I was particularly impressed by the results you achieved with 1.5mm twin-and-earth mains cables. You commented that you considered cooker cable too inflexible for hi-fi use, but what would be the advantage of using 2.5mm twin-and-earth? This is almost as cheap as 1.5mm and about as flexible. Would it result in an improvement in sound quality?

R. K. BROWN,  
LONDON N4

*It might, depending on your amp and speakers, but we would suggest the investigation of thinner cables would be more fruitful. The smallest twin-and-earth cable widely available is 1mm and this has proved successful under non-comparative conditions (by JK who has since gone on to something even thinner). It is worth remembering that DNM solid core is a mere 0.65mm square yet still proves an impressive cable.*

*Mains cables' looks can be improved by removing the white outer sheathing and twisting the black and red wires. This will marginally alter the cable's sonic character, but arguably for the better, and it makes it more flexible. However, avoid bending this or any solid core cable too much as it will increase oxidation and damage the skin, which appears to be a crucial conductive element. And if you bend it back and fore too much, of course, the copper can work*

*harden and snap.*

*Should your enthusiasm for experimentation not be satiated by mere speaker cables, then have a go at replacing the mains leads on system components with more of the above. You might be surprised at the improvements, but be warned – this could invalidate your guarantees.*

## DECISIONS, DECISIONS

I'm writing for your advice regarding buying a basic system as I am unsure whether to go for a turntable or CD player source. I had planned to go for a turntable because of the cost of software, but a dealer gave me the impression that by the mid-'90s the cost of CDs and records would be the same, and he also had doubts about the future of the LP.

I'm now in two minds – I've heard a CD player and find the sound OK if a little bright, and I had planned to spend a considerable sum on a turntable having listened to a Rega Planar 3 and a Linn Axis. These were compared with a Sony CDP-750 and to be honest I didn't notice much difference in the sound. The Rega was fitted with a Goldring 1040 whilst the Axis bore a K5. Do you think the Axis would sound noticeably better with a K9? The above observations were made using a system comprising Cambridge P40 amp and Monitor Audio R300 speakers but I have heard the Rega sounding quite brash in a different system.

MICHAEL JAMES,  
NEWCASTLE-UPON-TYNE

*It does look as though the music industry and the major audio manufacturing concerns, that own the likes of CBS and Polygram, are keen for CD to replace vinyl, in order to increase sales of both soft and hardware. However, as long as the public continue to vote with their wallets by buying vinyl it will be economically illogical for the industry to cease producing records. Unit sales are still three times higher than those for CD which may push the majors to increase the price of vinyl in the hope that price is the determining factor (which it usually is. If everyone owned a Rega would CD even have been a starter?) But so far chart albums are still a good four quid or so cheaper than their digital counterparts. So unless you listen mainly to classical music – in which case you now really have to have a CD player as so many major titles are being released on CD only – buy a*

*record player and enjoy some music.*

*As to which one – if you heard no difference between a front end costing £262 in total and one costing £375 through a perfectly adequate system, then we would suggest you go for the cheaper one. Of course, a better cartridge would change the sound of the Axis but I should imagine most Linn dealers would claim that even with a K5 it represents a significant upgrade over the Rega. However, there are those who would beg to differ. Choose with your ears and buy some albums with the change.*



Goldring's Axis beater the 10-40.

## SHELVED SOUNDS

In our new house the TV/audio room is 12 x 14ft. The household authorities (ie my wife) decree that the hi-fi system, including the speakers, must be confined to the fitted bookcases along one of the walls.

My present set-up is a Philips CD204, Naim Nait and Linn Kan speakers. The sound, from our mainly classical CDs, is very clear but rather lacking in stereo soundstage and somewhat dry in the bass. Bearing in mind the restriction to bookshelf speakers, can you suggest any worthwhile upgrades?

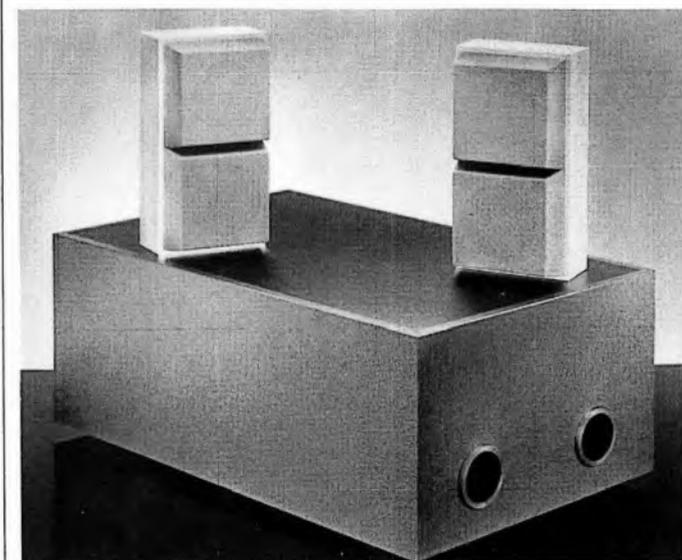
PHILIP FREEDMAN,  
LONDON NW11

*This is a tricky one, as although deeper bass isn't too difficult, better stereo imaging in a bookcase is a challenge. Most speakers need space in between and beside them to create an authentic impression of soundstaging. Usually, smallish speakers mounted in free space give the most precise imaging, and only well designed (see expensive) larger speakers can do this and give you deep solid bass. That said, it should be possible to improve on your present set-up with some carefully selected loudspeakers.*

*What immediately comes to mind is the new Allison CD6 which retails for £270 (see last month's Update and this month's Belfast Show Report for background info). This is a superbly finished 12-inch cube speaker with an upward firing bass unit and forward facing tweeter, an unusual concept but one that has been quite successful in the USA. Obviously they need a bit of space above them but are specifically designed for wall or shelf mounting.*

*An alternative worth considering would be one of the new 'satellite' and subwoofer combinations. These use very small mid and treble units, linked to a subwoofer that can be sited almost anywhere in the room. We haven't tested any as yet but would imagine that imaging and fidelity could be compromised. But they would be well worth trying. The companies marketing these systems include Bose, Jamo, Studio Power and Allison again with prices running from £300 upwards.*

*Unlike children these speakers are designed to be heard and not seen.*





**ROKSAN  
SPECIALIST  
ROKSAN  
DEALERS**

**CHICHESTER HI-FI**

40, LITTLE LONDON  
CHICHESTER,  
WEST SUSSEX.  
TELEPHONE  
0243 - 776402.

**ROKSAN RANGE EXCLUSIVELY  
AVAILABLE IN NORTHERN IRELAND**

**UP TO 9 MONTHS INTEREST  
CREDIT DETAILS ON REQUEST**

'Tullynure Lodge'  
18 Castlecaulfield Road  
Donaghmore, Dungannon  
Co. Tyrone, N. Ireland  
BT70 3PQ.  
Tel. (08687) 67935

Unit 6  
Donaldson & Lyttle  
Shopping Precinct  
Hope Street  
Belfast BT2.  
Tel. (0232) 332522



**ZEUS  
Audio**



*Roksan* Engineering Ltd.  
proudly  
presents

THE  
XERXES  
ARTEMIZ  
SHIRAZ

at

**SELECTIVE AUDIO**

The Forge Cottage  
19 Crossgate  
Otley LS21 1AA  
West Yorkshire  
Tel: 0943 467689  
Open Mon-Sat 10am - 6pm

**THERE USED TO BE ONLY  
ONE TOP TURNTABLE  
THERE STILL IS**

**THE XERXES  
FROM ROKSAN**

**PROVE IT  
YOURSELF AT  
STEVE BOXSHALL AUDIO**

*Steve  
Boxshall*  
**AUDIO**

41 VICTORIA ROAD, CAMBRIDGE CB4 3BW.  
Tel: (0223) 68305



## ASPIRATIONS

*Some of Sony's best equipment is installed in the home of Radio One DJ and Top of the Pops presenter Gary Davies. Dan Houston writes; Chris Richardson photographs.*

# The house that



# Gaz built

"Sorry I'm late," said Gary Davies as he arrived home from work one evening last month. We knew the reason: we had just watched him promoting the *Children in Need* appeal on BBC television – with the enviable task of explaining Radio One's part in the fundraising to Joanna Lumley.

Photographing his Georgian London town house we were spoiled for choice: five floors, which had previously been used as bedsits, are now designed for bachelor living. The transition took a year: a year which he describes as one of the worst of his life. For the last six months he was

living 'on site' as it were. The work involved stripping the house internally and re-designing much of the living space to create four bedroom suites.

Gary enlisted the help of Mancunian architect (and brother-in-law) Neil Collins although he had many of the ideas himself. A Hull firm of builders was commissioned for the work. Gary explained that it was both cheaper and more expedient to employ labour from out of town. "A London firm would be taking men off the job and would end up taking something like two years on what should have been a six month contract," he said.





His own 'suite' of dressing room – bathroom – bedroom, is on the top two floors of the house. "I always wanted an attic bedroom; I love that feeling of seclusion, of being at the top with no-one above me. I can look out of the window and see the stars and moon," he explained. It should be mentioned that the 'window' is a wall of glass, overlooking the London rooftops, and which continues over half the ceiling. Remote control concertina-blinds slide up with a noise like a James Bond movie sound effect and – *voilà*: your moon and stars (on a clear night).

Below these two top floors are bedrooms occupied by Gary's younger brother (a music business lawyer) and his mother when she comes to stay. "She comes down (*from Manchester*) for about three months of the year so I wanted to give her a proper home in London," he told me.

At ground level there is a 'spacious but cosy' lounge; it runs the length of the house but is split-level and 'halved' by supporting pillars. An extension balcony was added to overlook the garden. The bottom of the house contains a kitchen, eating area, and gym. The latter is walled in 'golden discs' presented to him by many different record companies.

Gary works out to sound supplied from a Sony Compact 710 CD midi system, relayed through JBL Control One loudspeakers, in both gym and kitchen. Although most of the equipment in the house is from Sony, it is a mark of honesty with the company and Robert Taussig (who installed it), that other products like the JBLs were used where seen fit. For instance, while Sony's



*Separates together (above): but don't let Oliver Reed put on a record. Left: Sonic headboard in the attic bedroom.*



top of the range ES system of separates was used in the lounge, the turntable is the Ariston Icon; a tribute both to Ariston, and to Sony who realise they cannot compete when it comes to the sound of specialist domestic hi-fi turntables.

The decision as to where the hi-fi was to be installed had to be made when Gary first bought the house. All the QED 79-strand wiring had to be hidden behind plaster and he said: "the hardest part was having to imagine the layout of the rooms; so they could get the wiring right for the hi-fi and aerial points. It's something many architects don't have a clue about."

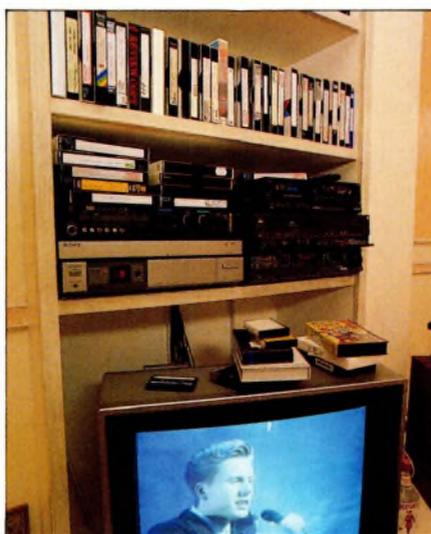
The idea of interlinking systems for sound throughout the house didn't appeal and so there are *FH1215* CD mini-systems in the attic and spare bedrooms. However, the attic system is linked through to Gary's bathroom and dressing room where JBL *Control Ones* are set in brackets in the ceiling. Bose *101* loudspeakers are flush mounted on either side of the headboard by his bed although at the time of my visit he was using Sony's own bookshelf models which he said he preferred. A Sony *21 XRT* television completes the attic electronics.

It is in the lounge though, that what amounts to real hi-fi is to be found. Here the audio, television and video equipment is arrayed on either side of the fireplace in alcoves which also contain part of Gary's collection of CDs, tapes and records. He describes the room as: "not a lifestyle interior; I just wanted a practical room for any occasion - I didn't want a posh room. Those rooms always feel so cold; mainly we sit in here and watch television or listen to music."

Listeners recline on French leather sofas bought from Ligne Roset (Manchester again!) and are serenaded by the *Choice*-recommended Sony *APM 22ES* loudspeakers standing on the marbled shelf. The hi-fi consists of the top-of-the-range *ES* separates (harking back to the days of Sony's *Esprit* range of real hi-fi). The amplifier is the capable (palpable even) *TAF700ES*, supporting *STS700* tuner, *TCK700ES* cassette deck and *557ES* CD player. These are topped by the Ariston Icon semi-automatic turntable which has (I imagine) to be used early in the evening if you're drinking. There is just room to slide the record onto the deck as it is sited snugly under the alcove shelving *sans* lid. A second pair of loudspeakers - Philips *DRC MkII 9434* - are in use in the other half of the lounge. These can be used with the Sonys, or on their own.

The sound in both sides of the room is totally different partly due to the characteristics of the room acoustics and those of the speakers. The smaller, upper half, gives a warm ambient feel to a piece of music. While moving in front of the Sony loudspeakers one is met by their fast, bright appeal.

When he gets time (an 'evening off' is rare) Gary said his favourite medium is the video (here an *EVS 600* hi-fi Video 8 recorder through Sony *Profeel* stereo TV). He reviews videos for a magazine, but also listens to the system, and for someone who is



Room to relax in the fast lane while the writing on the wall is: "young, free and single."  
Left: The video and satellite hardware.

manufacturers as uneconomical against high-quality cassette decks and opined that it would take off when enough people had embraced the CD medium.

In spite of this difference with the Sony PR directive (that DAT will definitely not be around except for professionals in the foreseeable future) both Sony and Gary have created a relaxing musical environment which must surely be the envy of many.

#### The equipment:

Sony <i>TAF700ES</i> amplifier	£500
Sony <i>TCK700ES</i> cassette deck	£500
Sony <i>STS700ES</i> tuner	£300
Sony <i>557ES</i> CD Player	£1,000
Sony <i>AMP22ES</i> loudspeakers	£250
Ariston Icon turntable	£235
Sony <i>Compact 710</i> CD Midi System	£1,000
Sony <i>FH1215</i> CD Mini System	£835
JBL <i>Control One</i> loudspeakers	
+ bracket	£200
Bose <i>101</i> loudspeakers	£150

Installed by: Robert Taussig Hi-Fi Consultants, 1 Formosa Street, London, W9. Tel: (01) 286 1728.

“The consistency with which audio ideals have been allowed to predominate over gadgets and facilities is what marks the Denon range out. . .”

*Hi Fi Choice, April 1988.*

DR-M07 £124.95

“In practice the ‘M07 simply sounded marvellous with good stereo, abundant detail and a welcome lack of artificiality. Obviously Best Buy material.”

*Hi Fi Choice*



DR-M12HX/R £219.95

“. . .the DR-M12HX proved extremely easy to use and provided fine sound quality both with recordings and pre-recorded tapes. . . it offers good results in every respect.”

*Noel Keyword, Hi Fi Review.*



DR-M24HX £289.95

“This is a very clean, open and spacious sounding recorder with an attractive range of facilities. The sound is very positively presented, to the point of being larger than life at times. A deck of breeding, and very well built to boot.”

*Hi Fi Choice*



**DENON**  
*Pure Performance!*

FOR YOUR FREE COLOUR CATALOGUE

write to: Hayden Laboratories Limited, FREEPOST, Chalfont St. Peter, Bucks. SL99BS.

# 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.

Hz 20 200 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**<sup>®</sup>

□ INNOVATION □ PRECISION □ INTEGRITY

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

AES  
Sustaining  
Member

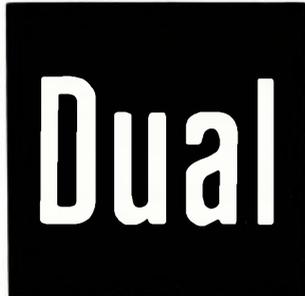
# Affordable Analogue

NEW LOW PRICES

**NOW ONLY £114.95**

**CS 503-1**

**NOW ONLY £114.95**

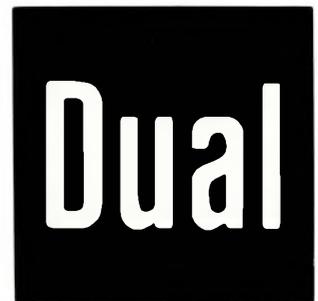


“The Dual CS 503-1 is the most important turntable introduced in the last year”

*New Hi Fi Sound, March 1988*

“In absolute terms it is a good turntable for the money, with few rivals at the all-in-price.”

*Hi Fi News, December 1987*



**NOW ONLY £139.95**

**CS 505-3**

**NOW ONLY £139.95**



“The improved 505-3 sounded impressive too with a deeper fuller bottom end and a greater feeling of authority.”

*What Hi Fi, December 1987*

“... 505-3 sounded better separated and slightly more vivid.”

*What Hi Fi, December 1987*



**FOR YOUR FREE COLOUR CATALOGUE**

Write to: Hayden Laboratories Limited,  
FREEPOST, Chalfont St. Peter, Bucks. SL9 9BS.

FREE . . .

# Fine Tuning

The Elite Alignment Gauge allows you to set up your cartridge **and** check the accuracy of your setting at **any** point on the record. This means that you can reduce to unprecedented levels the distortion caused by the error in tracking angle of your stylus.

Ordinary alignment protractors let you set the correct offset angle and overhang for your arm, but they assume that all records start and finish at the same outer and inner radii, and they do not show you how much distortion any particular adjustment gives at any point on a record. Also, they rely on the critical accuracy of two tricky judgements, and do not tell you directly what action may be necessary.

The Elite Alignment Gauge gives a direct reading of distortion at any groove radius, for any combination of offset and overhang, for any arm – including lateral trackers. And because you do many measurements across the record, you reduce the errors that creep in with only one or two measurements. You can even optimise settings for an arm with an incorrect offset angle built in.

To use the Gauge, you need only follow the instructions which follow. Please follow them carefully, to prevent possible damage to your equipment. If you do discover a problem see 'HELP' later on, where we have given solutions to the more common problems of measurement and adjustment of arms.

Do make sure you have got plenty of space and light in which to work while aligning your arm, or you will end up making mistakes. Your arm and cartridge are fragile precision instruments – so handle them with the utmost care.

## INSTRUCTIONS

If a new cartridge is being fitted to the arm it is useful as a first step to coarse set the overhang with the ruler printed on the edge of the Gauge. With the arm swung to the centre of the platter, the stylus should overhang the centre of the spindle by about 18mm (for a 220mm arm). Setting this will give a good starting point for the fine adjustment. See *Figure 1*.

If however your cartridge is already installed, don't adjust anything until you have used the Gauge to measure distortion accurately, or you will never know how right or wrong your original set-up was.

It is a good idea to set tracking force to about 1g and bias to zero, to prevent dam-

*Is your cartridge perfectly aligned?*

*This month we've given you a free Elite Alignment Gauge which, if you bought the full kit, would normally cost £12.99.*

*The instructions here may look daunting, but adjusting a cartridge is actually quite straightforward. With a clear head and a steady hand you'll soon have your cartridge properly set up to get the best possible sound from your turntable.*

age to the stylus if your hand slips.

Place the Gauge over the spindle of your platter, so that the stylus can be gently lowered onto the Gauge at 58mm radius (*Figure 2*).

Viewing from above, look along the side of the cartridge body, as in *Figure 3*. Is the side parallel with the crosslines on the Gauge? If not, rotate the Gauge on the platter until the cartridge side and crosslines are parallel. (*TIP* – lift the arm while you move the Gauge.)

This is illustrated by *Figure 4*, which is an 'X-ray eye' drawing of a headshell on the Gauge, for a typical example. The stylus is on the Gauge at 58mm radius, and the Gauge has been moved so that cartridge and lines are parallel. The stylus rests a little way from the centre line, between two curved lines. Following these two curved lines to the right, we find one labelled '-2%' and the other '-3%'. The stylus is resting at about -2.6%. This is the amount of distortion at 58mm groove radius. In other words, the stylus position on the Gauge, when Gauge and cartridge are lined up, is the distortion at that

radius. The principle is exactly the same as measuring distance with a ruler, and just as simple. Note that distortion figures can be plus or minus, which simply refers to which side of the central radial line the stylus is resting. (Minus distortion does not mean that distortion is subtracted!)

Now, to see what the distortion characteristics of your arm are currently, and to allow you to make the necessary correction for ideal performance, proceed to measure distortion at different radii and plot a graph of the result, using the graph sheet which is provided at the bottom of page 41. We suggest you photocopy this page several times to build up a stock of graph sheets. You already have the distortion figure at 58mm radius, so plot this first, as in *Figure 5*. If you are not used to plotting graphs, remember that all you are doing in fact is making a drawing of several stylus positions on the Gauge, with a slightly altered scale in the vertical (distortion) direction. So in *Figure 5*, the X is at 58mm on the horizontal axis and -2.6% on the vertical axis, just as the stylus was in *Figure 4*.

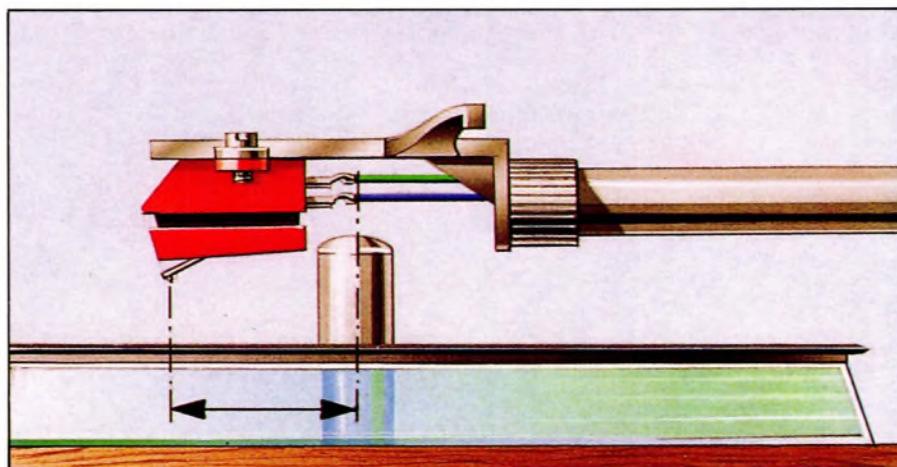


FIG 1

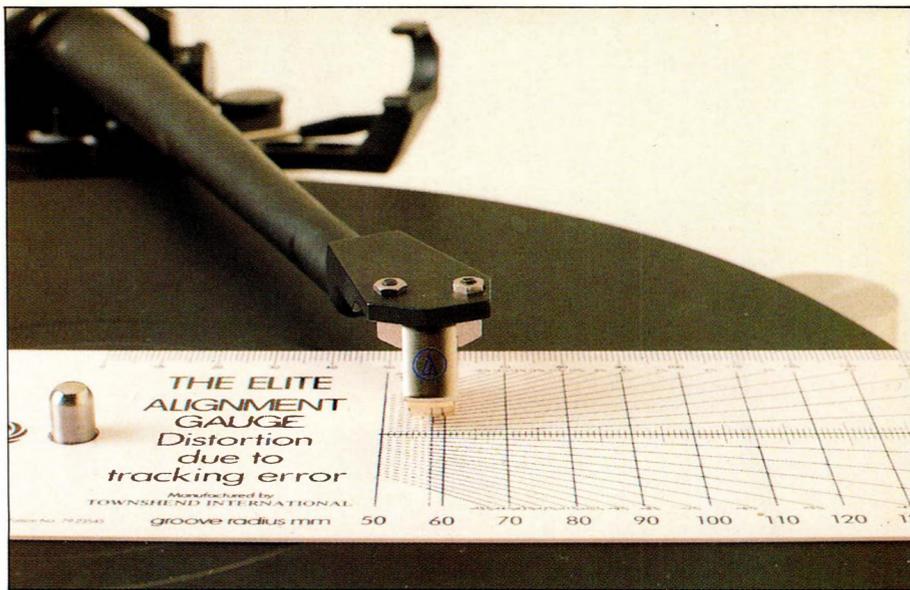


FIG 2

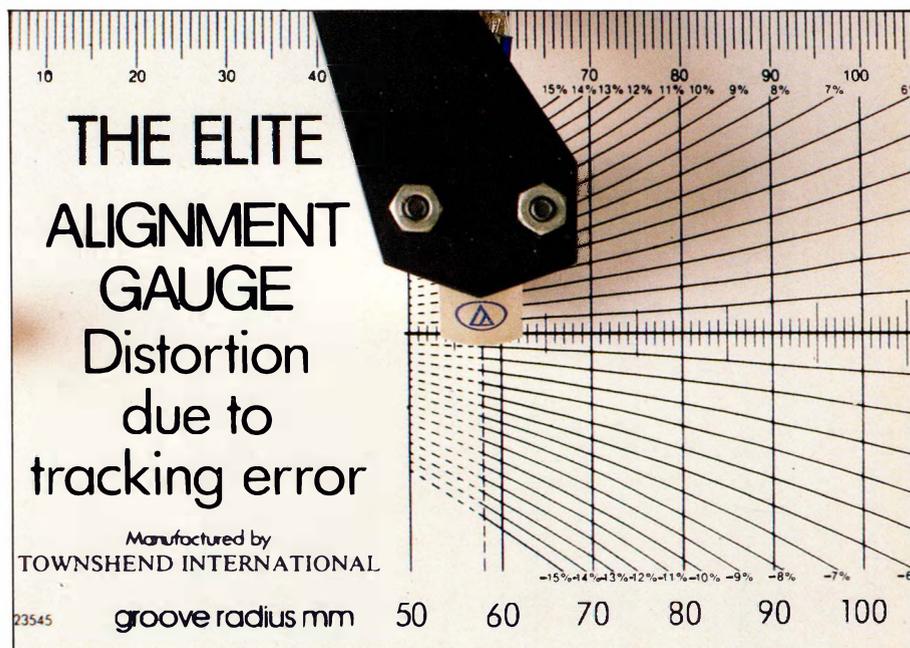


FIG 3

PLEASE NOTE: With a normal alignment protractor you do not move the protractor between measurements. With the Elite Gauge, you will probably move it for every measurement. **The position of the Gauge on the platter is quite irrelevant; what matters is the alignment of the cartridge body with the parallel crosslines on the Gauge.**

Next, measure distortion at 60mm radius. *Figure 6* shows an X-ray view of a stylus resting on the Gauge at 60mm radius, with the Gauge rotated so that the crosslines and cartridge are again parallel. The stylus is very near the  $-2\%$  line, at about  $-2.1\%$ . This means that the distortion at 60mm radius is  $-2.1\%$ . In *Figure 7* this point too has been drawn onto the graph sheet.

Move on to 70mm radius and repeat the process: cartridge and crosslines parallel; note the stylus position corresponding to

distortion; draw this point onto the graph sheet.

NEVER make a measurement with the cartridge and Gauge not aligned. Only when the cartridge side is parallel with the crosslines is the stylus position meaningful.

Then go to 80mm radius... and so on, in 10mm steps until you get to the maximum radius marker at 146mm. Each time mark a cross on the graph sheet. You will end up with something looking like *Figure 8*, although of course the exact position of the marks will depend on the setting of your particular arm.

Now draw a smooth curve that passes through or near as many of these points as possible. You may notice that some of the points are some way from the curve, as in *Figure 9*. This means that the distortion you measured at those radii is probably not quite accurate, so go back and measure the

distortion there again carefully.

### You now have a graph of distortion across the record.

Obviously, the ideal situation will be 0% distortion across the entire record. However, only a linear tracking or correcting arm will achieve this. In practice, it is possible to set a pivoted arm so that the distortion is less than 0.7% from the disc perimeter to the label. The trick is to ensure that distortion figures at the start, middle and end of a side are the same.

*Figure 10*, which is a distortion graph as it would appear for an optimally aligned arm, illustrates this point, showing how the highest distortion at any one point is thus minimised. This at once gives the lie to the myth of 'end-of-side distortion', and by implication points to the chronic degree of misalignment of record decks that suffer from it.

Now that you have produced a graph of distortion across the record, you can check it against the references given in the **Appendix**. If your initial setting was spot on, the graph will resemble *Figure 10*. Otherwise it will be nearer one of the others in the appendix. By following the procedure suggested with the printed graph nearest to yours in shape, you can improve the accuracy of your setting. You must now plot another graph to check that all is well. If not, don't give up but repeat the process again. The gain in accuracy you will achieve by taking the greatest care will well repay the time taken.

### ADJUSTING YOUR ARM

Methods of adjusting arms vary from model to model, but in most cases involve either sliding the cartridge backwards or forwards in the headshell or moving the arm base towards or away from the spindle.

Some arms have tapped holes in the headshell to ensure accurate offset angle, and overhang is adjusted at the arm base-plate. Some arm headshells have plain holes, and some have slots allowing you to adjust the cartridge by sliding it backwards and forwards. If you have instructions supplied with your arm they will give details; otherwise look for bolts which pass through slots or oversize holes and make the adjustment there.

If the adjustment is made at the headshell, be careful to keep the offset angle constant – don't rotate the cartridge but slide it along the slots.

The whole process of plotting the graph and making the necessary adjustment will only take a few minutes, once you have got the idea. Care is of the essence; roughly speaking, one millimetre or one degree of error corresponds to nearly 1% distortion extra, or more than *double* the ideal figure. And you thought that your cartridge was properly set up!

Patience in correctly aligning your cartridge will be rewarded by a much clearer and better-focused sound.

**Instructions summarised**

- Check arm overhang (18mm);
- Place Elite Alignment Gauge on platter;
- Align side of cartridge body with Gauge at 58mm;
- Mark distortion at that point on a graph sheet;
- Measure distortion across record every 10mm;
- Compare resulting graph with those in Appendix;
- Adjust arm if necessary to achieve ideal result;
- Measure distortion again to check accuracy of your adjustments;
- Play a favourite record.

Note: if you encounter any problem at any stage please see 'HELP'.

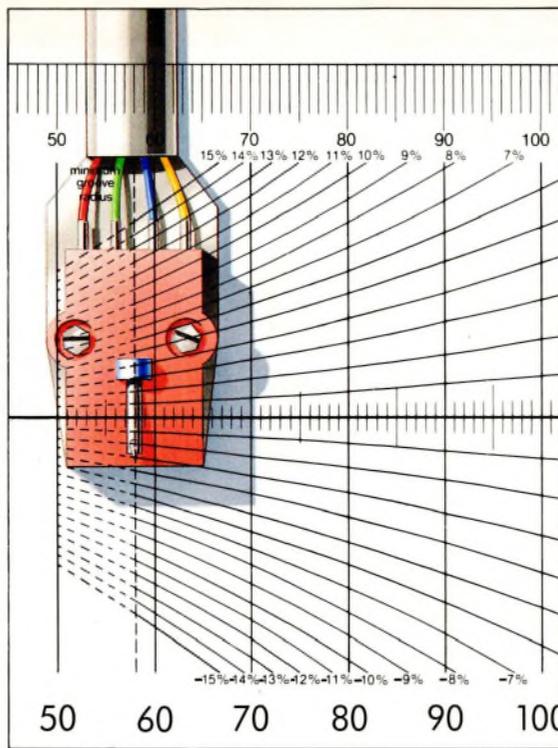
**NO GUESSWORK**

No longer do you have to guess at the implications of that last gnat's whisker of accuracy. If the overhang is one millimetre out, this can double the worst case distortion.

If overhang is one millimetre out and offset is wrong by one degree, the result can be nearly as good as perfect alignment or trebled worst case distortion, depending on whether the two errors add or cancel. Your free Elite Alignment Gauge shows exactly what is wrong.

There are several points worth making about arm alignment, to dispel a few popular myths. The first has already been mentioned, namely 'end-of-side distortion'. It can be seen from the graph of correct arm alignment that distortion at the end of a side is no worse than at the beginning and one intermediate point. However, the graphs of slightly incorrect alignment show that the distortion at the end of a side is more sensitive to alignment errors than that at any other point on a record. So misaligned arms naturally tend to give worse distortion at or towards the end of a record side than at the beginning, hence the notoriety of the apparent phenomenon. There are other problems associated with the increased groove curvature and reduced speed at the end of a side, but you can prove that these are less important than correct alignment by ear, simply by comparing a well aligned arm with one that is not.

Second, there is a belief that long arms give much less distortion due to tracking error than short ones. In fact, within the range of standard arm lengths the difference is small. Maximum distortion is roughly proportional to the inverse of arm length, so the worst case figure (0.65 per cent for a 220mm arm) varies only from about 0.7 per cent to 0.5 per cent for arms from 200mm to 280mm.



**NEVER make a measurement with the cartridge and Gauge not aligned. Only when the cartridge side is parallel with the crosslines is the stylus position meaningful.**

FIG 4 ◀

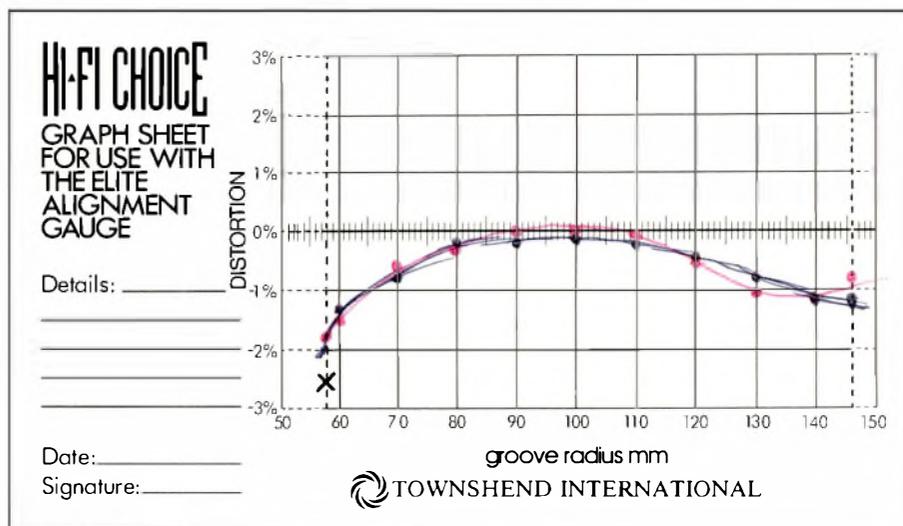
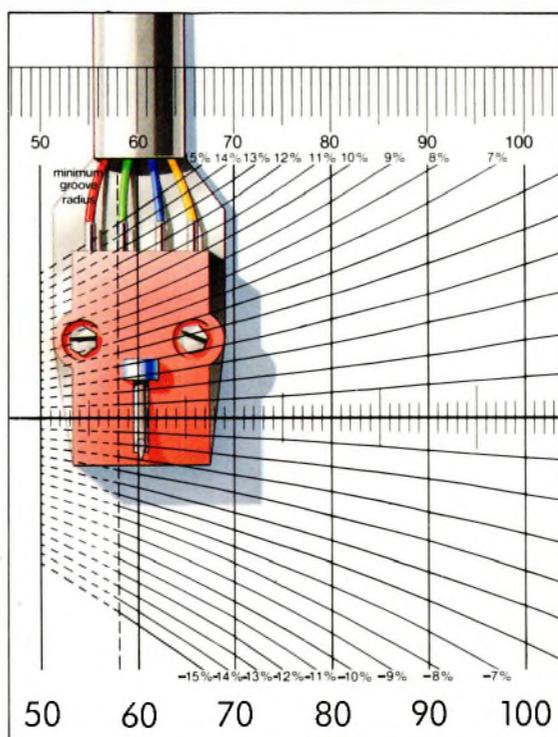


FIG 5 ▲

FIG 6 ◀



**THE LEICESTER HI-FI CO**  
OF ST MARTINS  
6 Silver Walk, St Martin's Square, Leicester LE1 5EW  
Telephone: (0533) 539753

6 SILVER WALK,  
ST MARTIN'S SQUARE,  
LEICESTER  
LE1 5EW.

TELEPHONE  
(0533) 539753.

QUALITY STOCKISTS FOR  
**ROKSAN.**

We sell **QUALITY** Hi Fi



MOVING TO NEW  
PREMISES  
RING FOR DETAILS

— We sell **ROKSAN**

at

*Queens Hi Fi*

2 Market Street,  
Barnstaple,  
Devon EX31 1BX.

Tel: 0271 46172

**SUSSEX AUDIO**



ROKSAN



163-165 CHURCH ROAD  
BURGESS HILL  
SUSSEX.

PHONE US FOR  
EXCELLENT  
ROKSAN EQUIPMENT.

**04446-42336**

**WE  
SPECIALISE  
IN  
ROKSAN  
EQUIPMENT**

**SHROPSHIRE HI-FI  
ST MICHAEL'S STREET  
SHREWSBURY  
SHROPSHIRE SY1 2ES**

TELEPHONE: (0743-232317)

Third, it may seem that alignment accuracy will be ultimately limited by the accuracy inherent in the construction of the cartridge, and especially in the mounting of the stylus in the cantilever. Again, this is indeed the case, but note that with a spherical (conical) stylus the stylus mounting is not critical, and in fact is only a second order effect for elliptic and parabolic stylii.

What is important is the alignment of the cartridge workings within its body, and in the nature of manufacturing this is generally very accurate. Manufacturers are unlikely to release information on such tolerances, but experience of using the Gauge with many cartridges has shown that in practice the cartridge construction is not a limitation.

Finally, remember that there is more to alignment than tracking error. Stylus rake angle and cartridge tilt, as well as the obvious tracking force and bias, all have an important effect on performance, with results of error being more obvious towards the end of a record side. Also, cartridge body movement, both bulk and vibration (possibly caused by loose arm bearings), can sound much like tracking error, as can effects due to a damaged stylus or cantilever. Remember too that secure cartridge mounting is vital. Where possible use non-magnetic Allen-headed hex bolts, but beware of over-tightening which can all too easily result in a cracked cartridge body!

## 'HELP'

In this section, we have tried to list solutions to the problems most often encountered in aligning a tonearm.

### 1. *There is no means of altering the setting of the arm.*

Are you sure? Most cheaper record decks do not have an adjustable arm base, but there are usually slotted holes for the cartridge bolts which allow the cartridge to be moved backwards or forwards – whatever you do, don't twist the cartridge but keep it parallel to the headshell edge. Some arms, especially older ones, have a detachable headshell with the adjustment being made from underneath, i.e. the headshell must be removed to alter the setting (eg Lenco). This is rather inconvenient but the process still doesn't take all that long. Be careful not to refit the headshell to the arm askew.

### 2. *There isn't enough adjustment range on the arm.*

This usually means that the cartridge offset angle is wrong, which you can check with the Gauge. In theory, offset is not adjustable on most arms, but unless the cartridge bolts are an interference fit in cartridge and headshell there will be scope

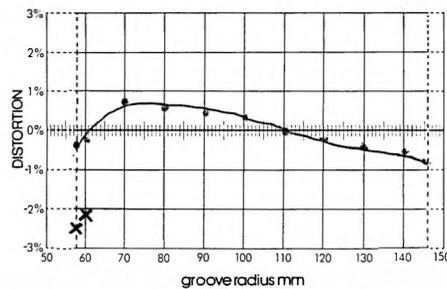


FIG 7

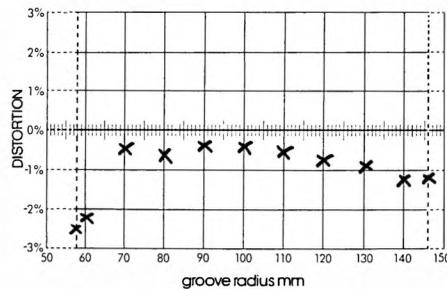


FIG 8

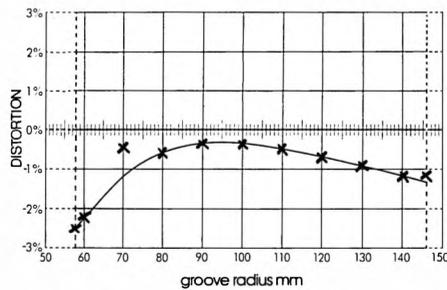


FIG 9

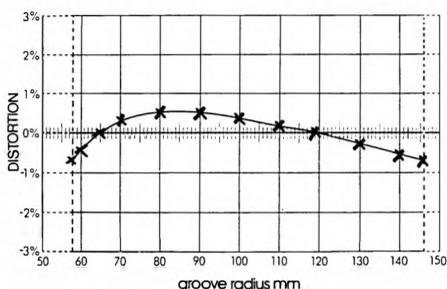


FIG 10

for some small amount of twist, leading to offset error. If the arm is really built incorrectly, you could always resort to using thinner bolts to take advantage of this twist. With slotted headshell bolt holes, it is easy to introduce twist by accident, so always take a careful measurement with the Gauge after making an adjustment.

### 3. *It still sounds dreadful after making the adjustment.*

Oh dear. If the sound is badly distorted all the time, stop playing records until you have had your stylus checked, as it may be badly damaged. If you have a microscope or powerful hand-lens, check the stylus for chipping. If it is chipped it will do permanent disc damage, so replace it at once. If it is merely worn it will not do so much damage, but you may not be able to see the symptoms under a microscope unless you

have one available with a magnification of at least 200. If the stylus has done more than about 1000 hours' service (maybe 2000 for a very high quality one) it will probably have worn at least a little.

If your stylus is perfect but you still get distortion, check the following: tracking force and Stylus Rake Angle; bias setting; arm friction (difficult to check, but if it is much too high you may experience groove jumping on loud passages); cartridge mounting; headshell leads; other leads; amplifiers; loudspeakers.

### 4. *There is no cartridge body panel along which to sight the alignment.*

This is uncommon but some cartridge manufacturers don't seem to want their cartridges to be properly aligned. It is not a good idea to use the headshell edge for alignment because the cartridge may not be absolutely parallel with it, but in extremis this is better than nothing. Use a mirror under the stylus to see whether the cantilever is parallel with the headshell side. Usually it is possible to see at least some part of the cartridge body beneath the mounting clip used in standard constructions (eg Shure).

## APPENDIX

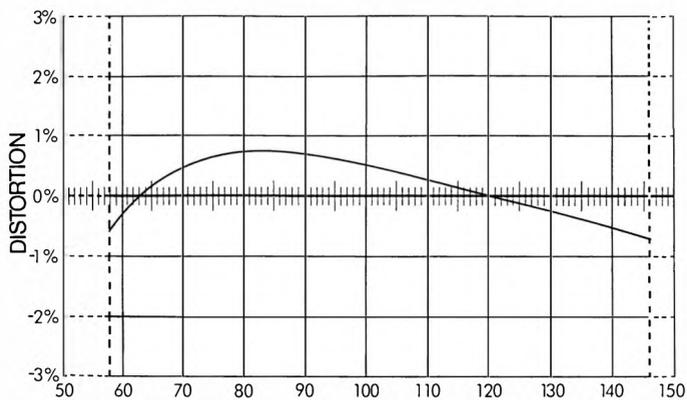
### Illustration of distortion versus overhang error.

Presented over the page is a selection of computer-generated graphs showing the variation of distortion across a record for various amounts of overhang error. Note that the error is specified as overhang error rather than offset error. This is because it is overhang that is normally adjusted on arms, with offset being fixed. It turns out that for small offset errors, of the order of a couple of degrees or so, the overhang can be adjusted to give a 'complementary error', that is, one which cancels the effects of the offset error. This is shown in graphs 8 and 9, while graph 10 shows what happens when the overhang and offset errors are non-complementary.

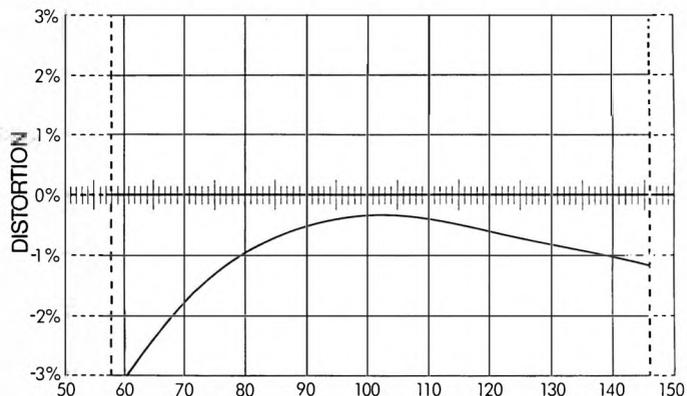
Thus it is possible to specify the graphs as if only one parameter were in error. These graphs can be used to decide how much adjustment is required in your arm by comparison with the graph you produced. For example, if your graph resembles graph 2, for the case of overhang too great by 1mm, reduce overhang by 1mm and all will be well. Only if offset is grossly wrong will it be impossible to obtain a good distortion curve. Otherwise, small errors will show up as a small increase in maximum distortion, with only two points (instead of the ideal three) having equal distortion figures.

When comparing graphs, look for shape rather than values at particular points; this averages out errors in measurement from point to point.

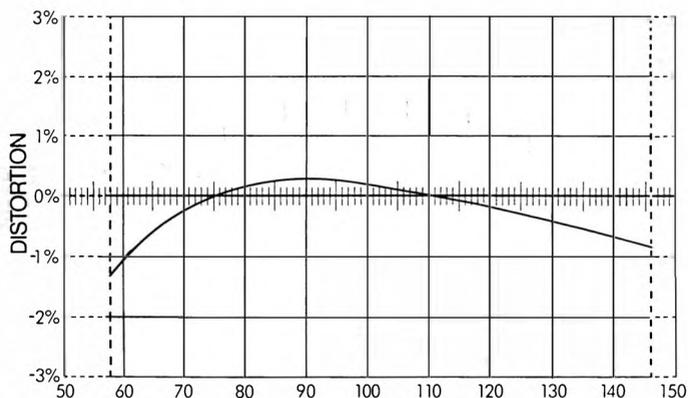
This selection of computer-generated graphs can be used to decide how much adjustment is required in your arm/cartridge set-up by comparison with the graph you've plotted. Bottom right is a blank sheet of graph paper which you can photocopy and cut out as many times as you wish.



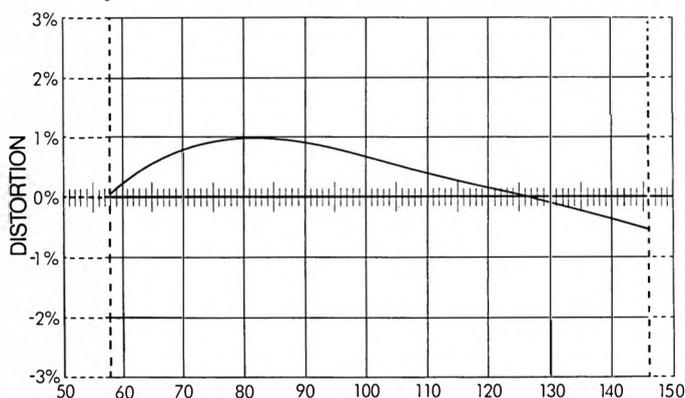
GRAPH 1. This shows the ideal case of correct offset and overhang (24.6 degrees and 18.1mm respectively for a 220mm arm). Maximum distortion is 0.66% (plus or minus, remember), and occurs at radii 53mm, 82mm and 146mm.



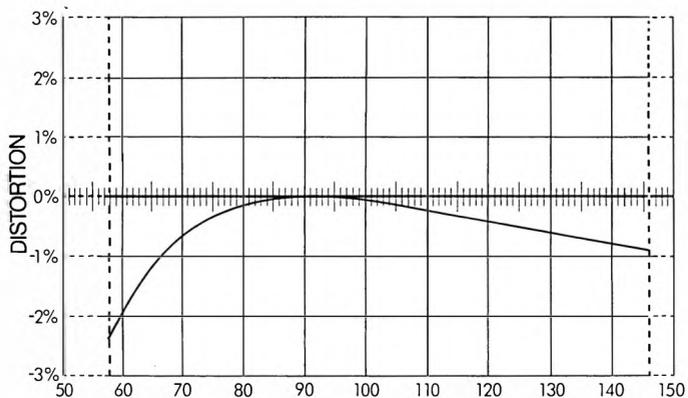
GRAPH 4. Overhang 4mm too large. Distortion off the scale at nearly 4%. In practice, misalignment as bad as this is far from rare in decks not carefully set up.  
Remedy: decrease overhang by 4mm and recheck adjustment.



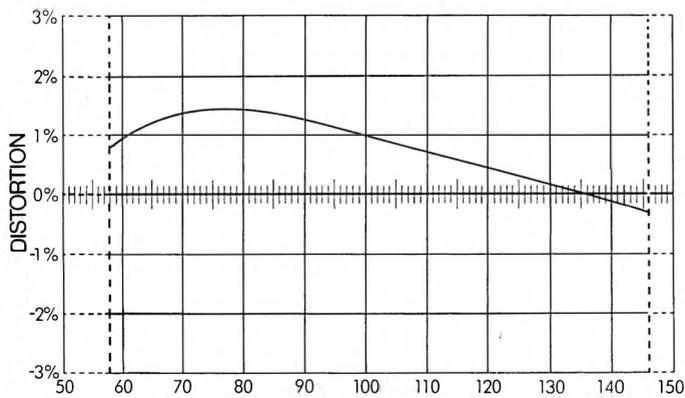
GRAPH 2. In this case, overhang is 1mm too large. Note end-of-side distortion is now about 1.4%, and beginning-of-side distortion is worse too.  
Remedy: reduce overhang (move arm base away from spindle) by 1mm.



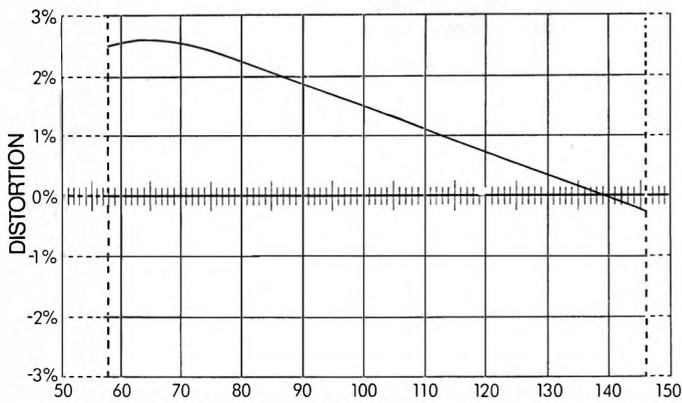
GRAPH 5. Overhang 1mm too small. As it happens, end-of-side distortion is now effectively zero, but away from the end it is around the 1% mark.  
Remedy: increase overhang (move arm base towards spindle) by 1mm.



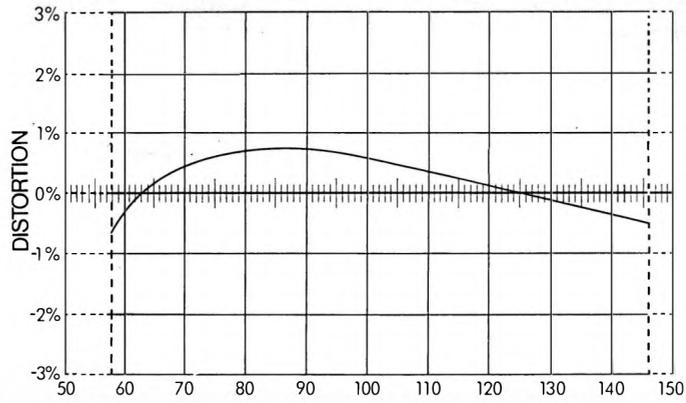
GRAPH 3. Overhang 2mm too large. End-of-side distortion now over 2% and highly audible.  
Remedy: reduce overhang by 2mm.



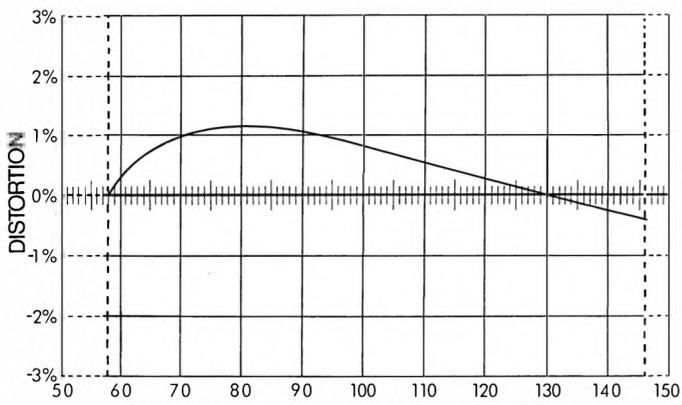
GRAPH 6. Overhang 2mm too small. Now end-of-side distortion is back above the ideal, and distortion is above 1% over nearly half the record.  
Remedy: increase overhang by 2mm.



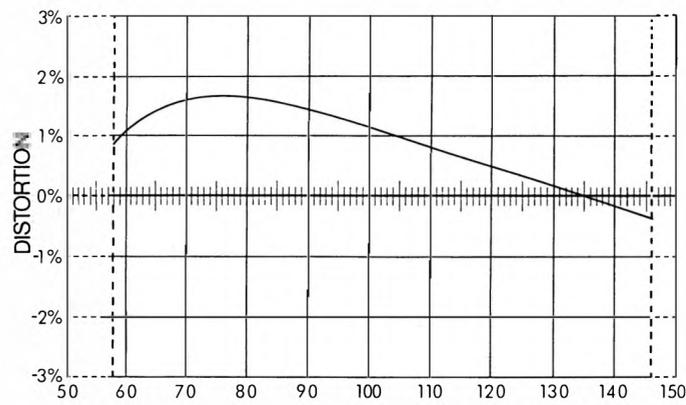
GRAPH 7. Overhang 4mm too small. Bad distortion over two-thirds of the record (though not as bad as with overhang too large, as luck would have it).  
Remedy: increase overhang by 4mm and recheck adjustment.



GRAPH 9. Now +1 degree of offset error has been combined with +1mm of complementary overhang adjustment to give a result which is only very slightly worse than perfect alignment. Note that +1 to +2 degrees offset error is built into some arms as the makers did not understand tracking error distortion and tried to minimise tracking error itself.



GRAPH 8. Offset angle 1 degree too large. Note similarity to Graph 5 for overhang 1mm too small. This implies that increasing overhang by 1mm should approximately compensate for this condition (see beginning of APPENDIX).

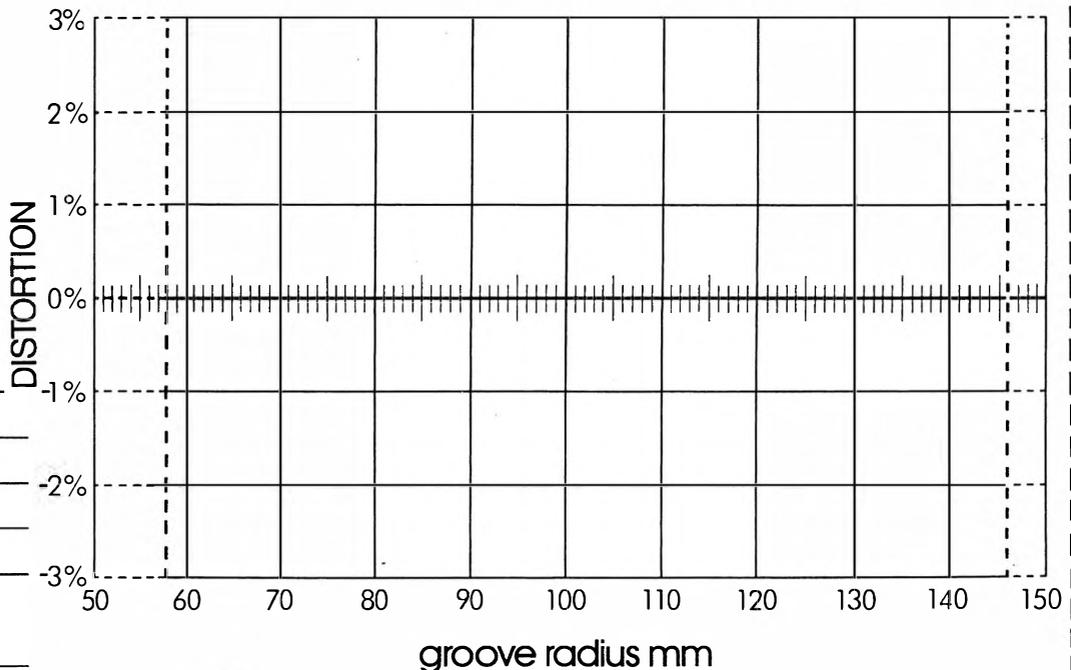


GRAPH 10. However, if the +1 degree offset error is combined with a 1mm overhang adjustment the wrong way (smaller rather than larger), the result is disastrous.

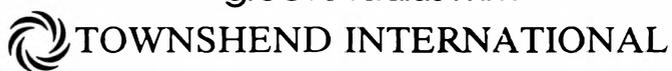
# HI-FI CHOICE

GRAPH SHEET FOR USE WITH THE ELITE ALIGNMENT GAUGE

Details: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



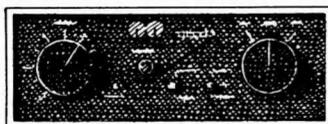
Date: \_\_\_\_\_  
 Signature: \_\_\_\_\_



# SO MUCH EXCELLENT HI-FI TO CHOOSE FROM...



Ariston Q Deck Turntable



NAIM NAC 32-5 Pre Amp

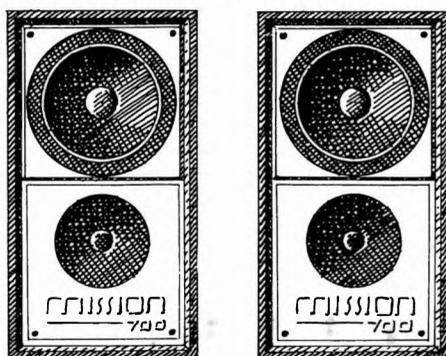


NAIM NAIT 101 FM Tuner

For our recommendations on ready to run systems, the following offer excellent reproduction and value.

NAD 3020E Amplifier (20+20)  
Dual CS: 503/1 Turntable\*  
AR 6BX Speakers  
**£299.95**

**SAVE £30**



Mission 700 Speakers



Sennheiser HD450 Headphones

NAD 3020E Amplifier (20+20)  
Dual CS: 503/1 Turntable\*  
B & W DM 110 Speakers  
**£329.95**

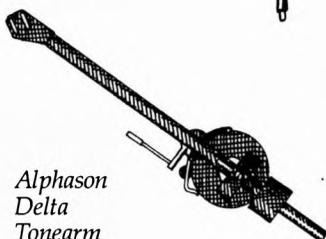
**SAVE £60**

A & R Alpha Mk 2 Amplifier (20+20)  
Dual CS: 503/1 Turntable\*  
Mission 700 LE Speakers  
**£349.95**

**SAVE £50**



Arcam Alpha Amplifier



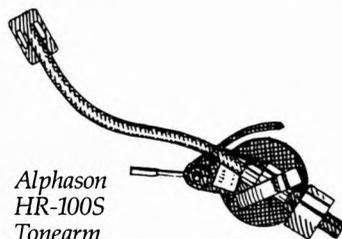
Alphason Delta Tonearm

NAD VP System  
NAD 3020E Amplifier (20+20)  
NAD 5120 Turntable  
NAD 8020E Speakers  
**£299.95**

**SAVE £20**



Arcam FM/LW/MW Tuner



Alphason HR-100S Tonearm

NAD 3130 Amplifier (30+30)  
Dual CS: 503/1 Turntable\*  
Tannoy Mercury Speakers  
**£379.95**

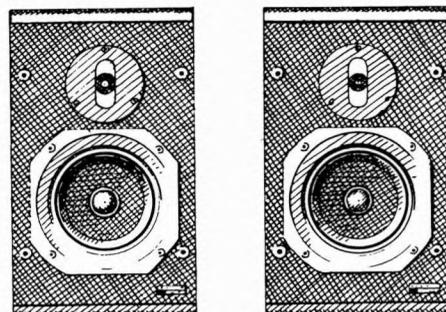
**SAVE £50**



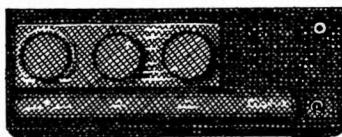
Marantz SD35 Cassette Deck

NAD 3130 Amplifier (30+30)  
Dual CS: 503/1 Turntable\*  
Heybrook HB1 Speakers  
**£389.95**

**SAVE £60**



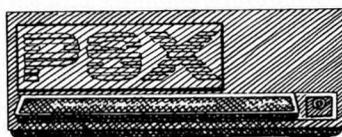
Heybrook Point Five Speakers



Cyrus One Amplifier

AR A04 Amplifier (40+40)  
AR EB101 Turntable  
AR 6BX Speakers  
**£399.95**

**SAVE £80**



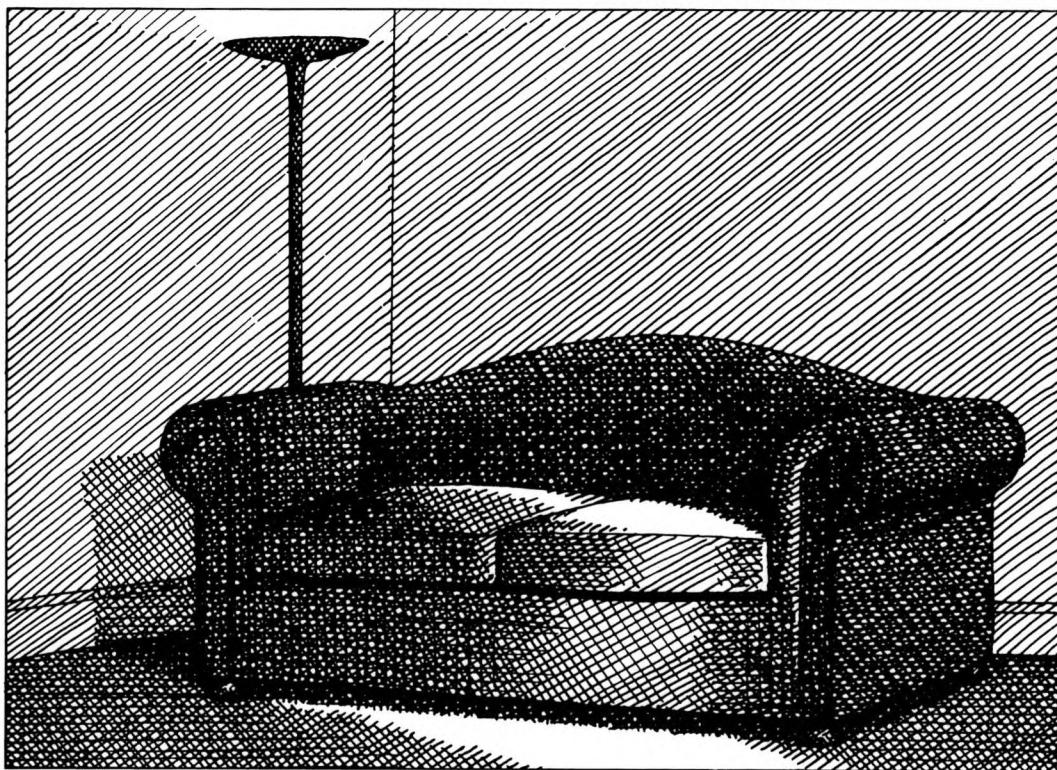
Cyrus PSX Power Supply

Inc. of 10m x 79 Strand Speaker Cable.

**FREE MAIL ORDER.** For Auditions carriage free mail order service, contact our Walton-on-Thames store.

**EXTENDED 2 YEAR GUARANTEE.** Auditions offer an extended 2 Year Guarantee on all items of equipment except styli.

# AND THERE'S STILL A LITTLE ROOM TO HEAR IT.



With so many different brands of hi-fi equipment around today the only way to decide which suits you is to listen to them.

That's why at Auditions we've got special demonstration studios. Where you can hear the best hi-fi, in a relaxed atmosphere, before you make your final choice.

And you'll be relieved to know that we only select and stock those items which match our own high standards of performance.

We've also got expert staff standing by to give you friendly impartial advice whenever you need it.

It's not often you get room service when you buy your hi-fi. So sit back and enjoy it.



*Auditions*  
THE ULTIMATE IN SOUND AND VISION

**Walton-on-Thames**  
44 High Street.  
Tel: 0932 232393

**Orpington**  
200 High Street.  
Tel: 0689 70625

**Chelsea**  
124B Kings Road.  
Tel: 01 2251209

**Witham**  
2 The Grove Centre.  
Tel: 0376 501733

**Brighton**  
89 Western Road.  
Tel: 0273 820437

## DMP CD OFFER

Special offer to Hi-Fi Choice readers.  
Save £5 on DMP compact discs.

**D**igital Music Products is a CD-only jazz label imported from the USA by leading audio specialist Absolute Sounds. As an introduction to the superb quality of DMP CDs, Hi-Fi Choice is offering its readers DMP CDs at a special price of £13.00 each, £5 off the recommended retail price.

As part of its exclusive deal with Hi-Fi Choice, Absolute Sounds is offering automatic free membership of the DMP Club as soon as you place an order for a DMP CD.

Membership of the DMP Club entitles you to:

- *Select any of the CDs in the DMP catalogue at special discount prices.*
- *First option on all new DMP releases.*
- *DMP's quarterly newsletter, which keeps you up to date on all the new releases, live tours, and forthcoming projects by DMP artists. The newsletter also features regular competitions in which you could stand to win any number of the hi-fi accessories distributed by Absolute Sounds.*

### **CD-443: TriCycle, Flim & the BB's**

Voted best jazz CD of 1985 by readers of Digital Audio in the US, combining pop melodies and jazz improvisation. Arguably the definitive DMP album, TriCycle has become a standard demo CD for stretching hi-fi loudspeakers to their limits.



### **CD-447: Tunnel, Flim & the BB's**

Flim & the BB's second album for DMP voted best jazz CD of 1986 by readers of Digital Audio magazine. A collection of joyful, melodic songs superbly played and recorded.

### **CD-451: Incredible Journey, Bob Mintzer Big Band**

A must for all jazz and big band lovers, Incredible Journey features Mintzer supported by some of America's finest jazz musicians - including Michael and Randy Brecker, Peter Erskine, Lawrence Feldman and Marvin Stamm.

### **CD-453: NY Cats Direct, John Tropea**

Brilliant New York guitarist John Tropea plays bluesy, improvisational jazz which alternates between thoughtful, melodic passages and electrifying blues solos. Supporting musicians include Steve Gadd and David Spinozza.

### **CD-454: Big Notes, Flim & the BB's**

Another tour-de-force from jazz quartet Flim & the BB's. Superb sound, joyous, uplifting music - and...(yup, you guessed it) ... voted best jazz CD of 1987 by readers of Digital Audio magazine.

### **CD-455: Lighthouse, Billy Barber**

One of the most popular DMP recordings, and rightly so - Barber's second album for DMP is full of beautiful melodies and heartfelt tunes. Barber's piano playing is stunning, accompanied throughout by an array of imaginative keyboard and synthesizer sounds.

### CD-459: **Braziliana, Manfredo Fest**

Blind-from-birth jazz legend, Manfredo Fest returns to the world of recording with this stunning CD invested with the rhythms and melodies of Brazilian jazz. Fest's piano playing throughout is inspired, as are the pure vocals of Roberta Davis.

### CD-460: **Thom Rotella Band, Thom Rotella**

DMP discovery Thom Rotella combines melodic acoustic guitar with funky electric solos on this mainstream jazz CD. Great sound - the recording was a prototype for one of the first Sony R-DAT demos.

### CD-461: **Spectrum, Bob Mintzer**

Spectrum is still fired with the big band sound of Mintzer's earlier DMP albums, but also sees the acclaimed saxophonist and composer experimenting with quintet and quartet arrangements. A superb collection.

### CD-462: **The Further Adventures of Flim & the BB's, Flim & the BB's**

The BB's fifth album for DMP and perhaps their best to date. Once again the band's characteristic blend of dynamic jazz, driving rhythms and pop melodies combine to form a memorable collection of songs.

*Simply fill in the order form opposite (or make a photocopy of it, if you prefer not to damage your copy of Hi-Fi Choice) and post it without delay to take advantage of this limited special offer.*



## TO ORDER DMP COMPACT DISCS:

*(Tick selections)*

- CD-443: TriCycle, Flim & the BB's
- CD-447: Tunnel, Flim & the BB's
- CD-451: Incredible Journey, Bob Mintzer Big Band
- CD-453: NY Cats Direct, John Tropea
- CD-454: Big Notes, Flim & the BB's
- CD-455: Lighthouse, Billy Barber
- CD-459: Braziliana, Manfredo Fest
- CD-460: Thom Rotella Band, Thom Rotella
- CD-461: Spectrum, Bob Mintzer
- CD-462: The Further Adventures of Flim & the BB's, Flim & the BB's

## PAYMENT

I enclose my cheque/PO made payable to Dennis Publishing for \_\_\_\_\_

selections at £13.00 each

Total \_\_\_\_\_

Please charge my Access / Barclaycard / American Express / Diners Mastercharge (delete as appropriate)

Credit card number \_\_\_\_\_

Expiry date \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Postcode \_\_\_\_\_

HFC 67

**Please send order form with payment to:**

Hi - Fi Choice Mail Order  
PO Box 320  
London N21 2NB



# MARKET RESPONSE

*In our exclusive market survey Dan Houston polls specialist UK hi-fi dealers on turntable sales, covering factors such as reliability and the future of this medium.*

With names like Deutsche Grammophon pulling out of the vinyl market, the day of the turntable may seem over. And the way forward looks paved with compact discs. But mind how you tread; with billions of records still in collections or circulation, sales of record decks are still steady – though now less than a quarter of that of CD players.

Estimates on the size of the turntable market vary from source to source. The Audits of Great Britain Group puts the numbers at 131,600 units in the 52 weeks before October 3 this year. GfK, another market statistician, is a bit more generous; they say about 160,000 separate turntables will be sold this year with a market value of around £40m. However, while AGB estimates a rise in sales by about 10,000 from the previous yearly period to October '87, GfK sees a 10,000 fall in units in its estimated UK volume figures from 1987.

This makes it impossible to say whether the market is growing or shrinking, but what is more significant is the amount of money people are now prepared to spend on a turntable. GfK says sales of sub-£90 turntables have fallen to around 25 per cent of the market with over 30 per cent of us now buying turntables between £150 and £250. The size of the £250-plus market has been growing steadily over the last 24 months however, and GfK put it at eight per cent for July and August of this year. According to Stefan Wilczek for the group, this figure would equate with about 12 per cent of market share by value. To confuse you still more with figures (I'm no great cook with books) AGB says that from its calculations for the summer period of last year nearly 30 per cent of us spend over £200 on a turntable.

These figures were borne out by comment from many of the dealers we approached who said that the CD revolution has raised expectation of sound quality in a previously purse-conscious Great British Public. In fact, several of our dealers here said they often sold turntables in preference to a CD player when a customer had

heard demonstrations of both. Half of the twenty or so dealers we telephoned said they sold more record players than CD players; seven said the opposite.

Dealers told us that many customers preferred the sound quality of a good record player – CD is often criticised for being 'two dimensional' and brash with a quality that is difficult and tiring to live with. Joe Lannigan of Cloney Audio said several of his customers in the Linn class had brought back their CD players after a few months as being a redundant part of the system.

Some dealers said CD sound was getting better – with improved DAC chips and the like – but it is obvious that among the clientele of the sit-down-with-a-coffee-and-listen style hi-fi salons the medium has a long way to go yet.

## RELIABILITY

Turntables are among the more reliable components in the hi-fi system. For one, there is not as much to go wrong as with a CD player, say. As an indication to quality control we asked what percentage of decks arrived from the manufacturer as faulty. We calculated a figure of 2.6 per cent which is around half the figure for CD players and consistent with our findings in our February 1988 issue. However, most of the 'faults' had occurred in transit according to the dealers, and we heard of whole batches arriving with smashed-in lids etc. We were told that the worst culprits seemed to be the Post Office, closely followed by Securicor. Linn Products, who is generally regarded with awe by the trade for its speedy and efficient parts distribution, uses TNT, and other preferred carriers of hi-fi are Independent Express and Federal Express.

In the unlikelihood of your turntable failing, most dealers would repair it themselves – replacing the requisite part. We asked dealers for their average service and repair time and heard from many that they could get parts (mostly from British manufacturers) within a 48-hour period. From the whole sample,

we calculated an average figure of just over two weeks. To get an idea of who is running the slickest service department we also asked dealers for the fast and slow manufacturers. Linn came out top with one or two days delivery time. There were also positive comments for Rega, Ariston and Michell. Systemdek is regarded as slow by several dealers, one of whom wrote of a 30 week average! Manticore and Dual were also denigrated, 'though Dual got a couple of 'fast' mentions.

The most reliable turntables according to our consensus are made by Linn, followed by Dual, Revolver, Rega, Roksan and Acoustic Research. Of course, reliability is a subjective thing in dealers and it follows that the more of a product you sell the more likely you are to find a duff one. Both Dual and Linn were criticised, with the Valhalla (electric speed change) board being the most cause of chagrin to Linn dealers. Our most unreliable manufacturer was said to be Ariston followed by Systemdek (for its *IIXE* turntable).

## DIAMOND LIFE

We wanted to get an idea of what dealers felt about cartridge or stylus life. The figures vary for moving magnets and moving coils (moving coils last a bit longer). Many people do not seem aware that their cartridge is the wearing point of the vinyl system and dealers told us of customers blithely wandering into the shop after ten years on the same diamond!

Replacing the stylus is important because a badly worn

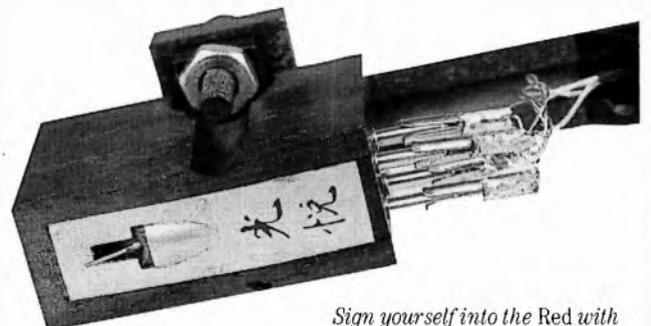
tip can lathe away at that precious record collection. The question is how often? The most common answer for moving magnets was 1000 hours or 14 months at a couple of records a night. Moving coils go a bit longer – to about 20 months. Hearing stylus wear is something that is difficult to gauge over a period of time, and seeing it (under a microscope) can also be difficult since ten per cent wear will barely show up to the eye, though it could significantly alter the sound of the cartridge.

John Oakman of AT Labs, pointed out that stylus life and replacement cost was important when considering which model to buy. John cited replacement cost of a £800 van den Hul *MC One* tip being around £180 while the £1,200 Koetsu *Red Signature* stylus costs £800. The replacement price works out at a quarter to two thirds of the new cartridge respectively.

The most important thing is to regularly update your cartridge – maybe auditioning a new model to gauge the wear of your own if you don't count how much time you spend listening.

## STANDING STILL

Optimum siting for a turntable is important in order to achieve isolation and avoid potential feedback. Most of the small sample of dealers we spoke to recommended Sound Organisation floor standing tables for suspended sub-chassis turntables, while the solid plinth type (Rega) benefits more from a wall shelf. Everything depends on your environment; a 'live' floor (one where you can feel passing lorries through your feet) will



*Sign yourself into the Red with Koetsu.*

convey vibration through any solid surface.

A couple of dealers told us the deck should not be on the same surface as the electronics. Jim Badland of Watts Radio, told us that even air pressure could lead to feedback; loudspeakers should not face the record player. The best advice would be to play it by ear and mug up on the manufacturer's advice as well as the dealer's.

## BELTING UP

An underestimated area for the do-it-yourself tweekers is the drive belt – most often a band of black rubber that runs from the motor pulley round the platter to drive it. The belt takes up the strain on starting your deck and the stretching involved leads to a finite life like everything else. The result is a slack belt which may be inaudible through the system but which detracts from the musical experience nonetheless. This is why hi-fi shops always have their decks running *Mrs Robinson*. Dealers were aware of drive belt life and gave us figures from between two and twelve years for replacement. We worked out an average of just under four years which is slightly longer than the February figure.

One way to prevent belt fatigue, especially on decks with heavy platters, is to give the platter a pre-emptory spin before starting to avoid the torque effect.

## THE BEST SELLERS

Our Survey form gave dealers three price points, asking them for their three top-selling turntables. The results are calculated on a points system; five for the top seller, four for the second, three for the third and then added up.

### Budget below £199

- |                   |    |
|-------------------|----|
| 1) Dual 505 III   | 84 |
| 2) Ariston Q Deck | 65 |
| 3) Dual 503 II    | 48 |
| 4) Rega 3         | 48 |
| 5) Rega 2         | 38 |

All the above decks featured as best sellers when we asked dealers in our February '88 issue.

### Mid Price £200-£450

- |                                |    |
|--------------------------------|----|
| 1) Linn Axis/Basik Plus        | 80 |
| 2) Manticore Mantra/Rega RB300 | 35 |
| 3) Systemdek IIX/Moth Arm      | 34 |
| 4) Michell Synchro             | 26 |
| 5) Ariston Icon                | 25 |
| 6) Revolver/Own Arm            | 21 |



### Top Priced Best Sellers £451 plus

- |                            |    |
|----------------------------|----|
| 1) Linn LP12/Ittok         | 78 |
| 2) Roksan Xerxes/RB300     | 50 |
| 3) Alphason Sonata/HR100S  | 26 |
| 4) Michell Gyrodeck/SME IV | 23 |

In the top priced category there was much more variation, with different dealers citing different 'preferred' deck/arm combos. The Linn, Roksan and Michell combinations here were also best sellers in February '88.

## CARTRIDGES

We also asked dealers for their best selling cartridges in three (compatible) price brackets.

### Budget – Up to £35

- |                         |     |
|-------------------------|-----|
| 1) Audio Technica AT95E | 117 |
| 2) Linn K5              | 45  |
| 3) Nagaoka MP11         | 35  |
| 4) Goldring Epic II     | 31  |
| 5) Rega Bias            | 29  |

### Mid Price £36-£100

- |                        |    |
|------------------------|----|
| 1) Linn K9             | 86 |
| 2) Audio Technica ATF5 | 62 |
| 3) Audio Technica ATF3 | 55 |
| 4) A&RP77              | 42 |
| 5) Rega Elys           | 30 |

### Top Price – Over £100

- |                          |    |
|--------------------------|----|
| 1) Audio Technica AT-OC7 | 72 |
| 2) Linn Troika           | 50 |
| 3) Linn Karma            | 24 |
| 4) Linn Asaka            | 24 |

The results of this survey are calculated from sending questionnaires to dealers up and down the country. The participants are for the most part independent specialist hi-fi retailers such as BADA members who are to hi-fi what tailors are to

*All Linn this together: LP12 is a favourite though Valhalla boards don't boast of Viking strength.*

clothing. The returns are then backed up by telephone canvassing to put some flesh on the bones of our findings.

The survey complements the review topic every month but concentrates on different criteria to give readers a broader base on which to make their decisions. We do not pretend that the figures here are representative of the market as a whole, the survey is a poll and should be seen as such.



*If Linn isn't your Karma try this.*

## PARTICIPATING DEALERS

Our thanks to the following dealers for taking part in this survey:  
A Fanthorpe Ltd, Hull, Humberside.  
Analog Audio, Finchley, London.

Aston Audio, Alderley Edge, Cheshire.  
AT Labs, Enfield, North London.  
Audio Insight, Milton Keynes, Buckinghamshire.  
Avon Hi-Fi Ltd, Shrewsbury, Shropshire.  
Basically Sound, Bracon Ash, Norfolk.  
Better Hi-Fi, Liverpool, Merseyside.  
Brentwood Music and Hi-Fi Centre, Brentwood, Essex.  
Chew and Osborne Ltd, Saffron Walden, Essex.  
Chichester Hi-Fi, Chichester, West Sussex.  
Cleartone Hi-Fi, Wolverhampton, West Midlands.  
Cloney Audio, Blackrock, Dublin, Eire.  
Covent Garden Records, London WC2.  
Doug Brady Hi-Fi, Covent Garden, London.  
Eastwood TV Ltd, Leicester, Leicestershire.  
Elite Hi-Fi, Harrogate, Yorkshire.  
Gilson Audio Ltd, Middlesbrough, Cleveland.  
Grahams Hi-Fi, Pentonville Rd, London N1.  
Hi-Fi Centre, Wilmslow, Cheshire.  
Hi-Fi Experience, Tottenham Court Road, London.  
Island Compact Disc Centre, Douglas, Isle of Man.  
Jeffries Hi-Fi, Eastbourne, East Sussex.  
KJ Leisuresound, London W1.  
Lyon Audio, Stanway, Colchester, Essex.  
Moorgate Acoustics Ltd, Rotherham, S. Yorks.  
Nottingham Hi-Fi Centre, Nottingham, Nottinghamshire.  
Now That's Hi-Fi, Portsmouth, Hampshire.  
Paul Green Hi-Fi, Bath, Avon.  
Pro Musica Ltd, Colchester, Essex.  
Radlett Audio, Radlett, Hertfordshire.  
Rogers Hi-Fi, Guildford, Surrey.  
Selective Audio, Otley, W. Yorkshire.  
Sound Exclusive, Cranleigh, Surrey.  
Spatial Audio, Tottenham Court Road, London.  
Stereo Stereo, Glasgow.  
The Audiofile, Bishops Stortford, Hertfordshire.  
The Cornflake Shop, Windmill Street, London W1.  
The Music Room, Glasgow.  
The Sound Organisation, Cathedral St, London SE1.  
University Audio, Cambridge, Cambridgeshire.  
Watts Radio, Somerton, Somerset.

**NB Any dealer who feels aggrieved that he is not on this list, and would like to be consulted in future, either regularly or intermittently, please write to us at 14 Rathbone Place, London W1P 1DE, or telephone (01) 631 1433.**



## LET YOUR DEALER GUIDE



How can we thank all those good people who nominated us for the Sony/Hi-Fi News Award? By becoming even better, that's how! To which end we are on the move. Our new premises at

### 4 QUEENS WALK, READING

will be much larger than our present abode, thus allowing us to improve the standard of our service even further. We won't waste this space, or your time by trying to describe our new store, just simply say that from the

### FIRST OF FEBRUARY 1989

Reading Hi-Fi Centre will be conducting its business from the most luxuriously appointed specialist emporium in the Thames Valley, if not the whole of the South!  
Exaggeration? . . . Poetic Licence? . . .  
Come and see for yourself.

## LET YOUR EARS DECIDE

LET YOUR  
DEALER GUIDE

LET YOUR  
EARS DECIDE

■ READING HI-FI CENTRE ■



4 Queens Walk, Reading, Berkshire, RG1 7QF

Opening Hours: Tuesday-Saturday: 9.30am to 5.30pm (Lunch: 2 to 3pm. Except Saturday)

● CLOSED ALL DAY MONDAY ●

▶ DEMONSTRATION APPOINTMENTS ADVISED ◀



# CHOOSING AND USING . . . TURNTABLES AND TONEARMS

*Vinyl disc is still the prime source for the hi-fi enthusiast, yet record players have to perform minor mechanical miracles to do a proper job, as the following introduction explains.*

Despite the claims of more recent rivals, the LP disc has remained the prime source for music lovers for over 30 years, building a vast historical repertoire which will ensure it continues to have a future for present and forthcoming generations. The format has not been without its ups and downs (remember quadraphony), but the last ten years have seen continual and substantial improvements, not so much in the discs themselves but in the quality obtainable on replay.

During the 'bad old days' of the 1970s, the LP came under strong attack as a result of indifferent manufacturing quality control. Lack of surface defects allowed the Musicassette to make a strong challenge, but with hindsight it may be seen that much of the problem with LPs came from poorly designed and matched replay equipment. This is not to say that a good quality record player can overcome all the inherent problems of the vinyl disc, or all the ravages of time and mistreatment. But it is true to say that a carefully chosen specialist player can emphasise the musical values and go some way towards avoiding the engineering limitations.

Such a claim may sound a little far-fetched, particularly to those who suffered the worst excesses of the direct drive period of turntable design. But the marketplace itself provides the justification: ten years ago the specialist UK turntable barely existed; now a dozen or more manufacturers are competing fiercely to provide a sound quality alternative to the superficially flashy but sonically inadequate products which are typical of much of Far Eastern production.

## THE VINYL PROBLEM

One trouble with vinyl is that it is too effective a music storage system. The wide dynamic and frequency range of the signals which end up embedded in the plastic are a mechanical engineering nightmare to

recover properly, because they are microscopically tiny – smaller, indeed, than the stylus which is trying to 'read' them. And to make matters worse, the turntable/disc is massively heavier than the stylus which is resting on it.

The cheap record player merely recovers the top few layers of information, the loud bits and the bass bits in particular. It can handle the quiet and trebly bits too, but if a loud bit comes along it is apt to 'swamp' the mechanics of the system, creating unwanted vibrations within the arm, cartridge or turntable which are much larger than the delicate subtleties of the record groove that the cartridge is trying to read. It is therefore hardly surprising that all record players are inadequate. It's just that some are much less inadequate than others.

## THE TURNTABLE

As for the turntable itself, its basic function is to rotate at precisely the right speed and provide appropriate support for the arm and cartridge. This sounds simple enough, but what is easily stated as an objective turns out to be devilishly difficult to achieve in practice, for all manner of reasons. A turntable is a most effective seismograph, capable of detecting any vibrations in the record surface besides the information actually in the groove. So some care needs to be taken to provide isolation, both from the vibrations in the turntable motor and from any external environmental influences, and the quality of main bearing is clearly vital.

The drive function itself is far from simple, because the groove drag created between the disc and the stylus is variable, according to the loudness and frequencies of the actual music. A loud bit comes along and tries to slow the turntable down, but by the time it has had a chance to respond its speed has already fluctuated and the loud bit has finished – with a good chance of

speed overshoot in the quiet bit that follows. And if more power is taken from the motor during the response, this will pump more and/or variable mechanical vibration into the system. The designer has to choose just the right combination of motor drive, pulley and belt construction, in conjunction with the flywheel inertia of the platter itself and appropriate isolation of the motor, all within the cost constraints of the marketplace.

Equally tricky is the support for the arm, and its relationship to the platter itself and the plinth system employed. The arm gets a good shaking from the cartridge when playing a record, and most good arms transmit much of this vibration on into the turntable top plate or subchassis structure. To some extent the arm and turntable should be considered together, in order to allow the energy to be dissipated so that it does least harm, but there are various different possible solutions, some of which may work better with one arm than another, or even with one cartridge rather than another.

There is no single right approach to building a turntable, because the end result comes from the skillful balancing of different compromises.

## THE TONEARM

Whether you call it a pickup arm or a tonearm, there is absolutely no doubt that this item, whether part of an integrated player or as a separate item, plays a major part in determining the character of sound.

If it were possible to create an arm that provided a vibration-free, rigid support for the cartridge, while at the same time being light enough to allow the cartridge to follow the groove spiral, there would be no problem. Unhappily this is not possible: all lightweight pivoted beams, 7 or 9 inches long, show some vibrational modes across the exceptionally wide (three decade) span of the audio frequency range, and this is one of the factors responsible for

differences in tonearm sound quality. The designer has various options in terms of bearings, tubes and termination constructions, in damped or undamped operation, and in single pivot or parallel tracking. Add in the cost constraints and cook until fully baked.

Each approach has its validation in some theory or another, and sometimes even produces a result which reflects the principles employed and choices made. For example, parallel tracking arms are usually shorter and therefore more rigid for the same effective mass; free from the uncertainties of offset bias and its compensation, they give exceptional stereo imagery. But against these advantages must be set the cost and complexity, not to mention the difficulty of ensuring rigidity in a sliding bearing, and the variations resulting from the changing bearing centre. And one can construct similar arguments for and against other tonearm *modus operandi*.

More straightforward is the matching of arm and cartridge, based on a simple mathematical formula so that the combination has its main mechanical resonance in the range of frequencies where it will do least harm.

This resonance is a major cause of record player ills, and cannot be avoided. Damping may be present in arm and/or cartridge, but this is no cure-all. More important is to place the resonance low enough to avoid upsetting the bass sound quality, but high enough to avoid excitation from disc warps. The generally accepted ideal range is 8-12Hz, but carefully chosen systems can operate satisfactorily a little beyond. Lowering the resonance can improve the bass reproduction, but usually at the expense of general stability at higher frequencies, and vice versa. For the technically-minded, an explanation of our test procedures is given on page 99.

# Sounds Exclusive



You can't take your system to a shop!  
 Let us take our shop to your system.  
 We specialise in home comparisons.  
 For an Appointment or enquiry,  
 Telephone Guildford (0483) 276439

Alphason Y.B.A. Michell Cambridge Vecteur  
 Albany Sumo Kiseki Spica Opus 3 Voyd  
 London Milltek S.M.E. Jecklin Source  
 Alexander Clear Audio Quicksilver Gryphon

# O'BRIEN hi-fi

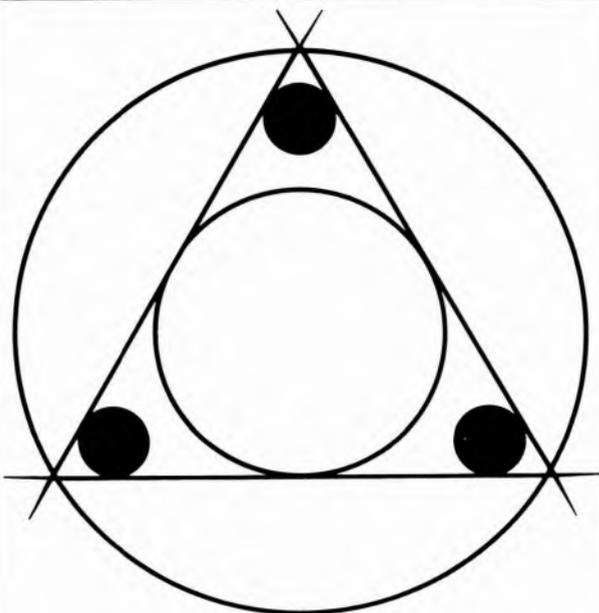
QUALITY EQUIPMENT ON DEMONSTRATION ON MOST OF THE BEST BUYS



FAMOUS NAMES IN HIGH FIDELITY EQUIPMENT  
 FROM A&R (CAMBRIDGE) • AR • BEARD • CAMBRIDGE  
 AUDIO • CELESTION • DENON • DUAL • GLANZ •  
 HADCOCK • HARMON • KARDON • HELIUS •  
 HEYBROOK • HITACHI • KEF • LINN • LOGIC •  
 MARANTZ • MICHELL • MORDAUNT-SHORT •  
 MERIDIAN • MISSION • MONROSE • MYST •  
 NAKAMICH • NYTECH • OAK • ORTOFON • PINK •  
 TRIANGLE • QUAD • QED • REVOLVER • REVOX •  
 ROGERS • ROTEL • SONY • SUPEX • SYRINX •  
 TECHNICS • THORENS • YAMAHA

95 HIGH STREET, WIMBLEDON VILLAGE, LONDON, SW.19. 01-946 0331  
 • CREDIT FACILITIES (Trinity Finance APR. 38.4%. Written details on request)  
 • SERVICE FACILITIES • ACCESS/BARCLAYCARD  
 • FULL ORDER & EXPORT SERVICE • Opening Hours: Tues-Sat 9-5.30.

HIFI MARKETS



# VOYD

"...there's little doubt in my mind that, *the Voyd* is one of the world's finest sounding turntables."

John Bamford  
 Hi Fi Choice Nov 1988

VOYD TURNTABLES LTD  
 ANCHOR HOUSE,  
 WARWICK PLACE, CHELTENHAM,  
 GLOUCESTERSHIRE,  
 GL52 2NP.  
 TEL: (0242) 574528  
 FAX: (0242) 570131

# ALPHASON SOLO/XENON MCS

ALPHASON, 190-192 WIGAN ROAD, EUXTON, NR. CHORLEY, LANCS PR2 6JW. TEL: (02572) 76626.



The under-£400 *Solo* costs around half as much as the flagship *Sonata*. But the system tested here also includes an optional out-board quartz locked mains power supply (£130), which is a plug replacement for the standard mains lead and adds a switched 33/45rpm facility to the basic 33rpm only design. And for this test the deck is teamed with the £262.50 *Xenon MCS* pickup arm.

The platter, with integral moulded belt lip, is made from an inert proprietary mineral-loaded synthetic material (used also on the *Sonata*). The upper surface has a flat, textured finish with label recess on which the record rests directly. Drive is by flat belt from a 24-pole synchronous motor. The single point main bearing is a large and well anchored assembly whose outer bush is a novel self-lubricating plastic based on PTFE nylon and other materials which is said to become quieter as it wears. The armband bolts onto the subchassis and can be replaced with ease.

The suspension is a classic undamped, low frequency design using three springs which are adjusted from above. One adjuster is below the platter but it can be reached (with difficulty) without dismantling. Plinth design is based on attractively profiled solid black ash – incidentally now made by Alphason itself – with an MDF inner liner for damping. The lid has friction hinges.

The *Solo* is a universal deck, but is tested here with Alphason's *Xenon MCS* (Linn cut-out compatible) tonearm, which uses the S-shaped one-piece damped titanium armtube/headshell pioneered in the flagship *HR-100S*. This model uses simpler tool steel bearings with lower preloading (compared to the *100S's* ceramics), a rigidly clamped (uncalibrated) counterweight, thread and weight bias compensation and concentric gimbal bearings; the vertical bearing axis does not maintain optimum cartridge orientation over warps. The *MCS* suffix refers to the van den

Hul *MCS* wiring which is used.

## LAB REPORT

Wow and flutter is a little higher than some, buoyed by traces of long term wow artefacts. The bearing is quiet, however, and rumble fairly low. The various structural plots suggest that there are a few important dominant modes, mostly a little over 200Hz, but that the suspension system does its job well enough on the whole. Platter ringing is well controlled, but the deck did have a tendency to shed its belt, especially at startup, and there are other indications that belt tension is a little low. Changes here could improve wow and flutter performance.

Arm structural resonances are well controlled, with a damped first breakup mode at around 1.1kHz. The bearings give excellent performance with no perceptible play.

## SOUND QUALITY

Given the hard, non-resonant platter and absence of a separate mat, I had half expected to hear a sharp sounding turntable in the Pink Triangle tradition. Instead *Solo* has a classic, almost Linn-like balance, which majors on a warm, lucid bass and mid-band and a good overall feeling of stability and control across a wide effective dynamic envelope. However, a suggestion of low rate pitch variation is sometimes audible.

Transient information is extremely well presented without smearing or loss of clarity, yet there's a certain underlying softness at the core of this deck which leads to a perceptible holding back during dynamic events. Where *Solo* strays, it does so euphonically.

## CONCLUSIONS

The relatively advanced platter and main bearing distinguish this well presented deck. A qualified welcome is plainly in order – the qualification due to a price which is perhaps a shade high for the performance on offer.

## TEST RESULTS

### Motor section

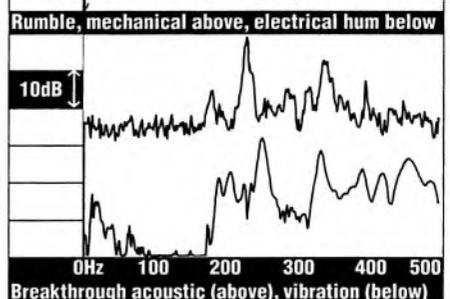
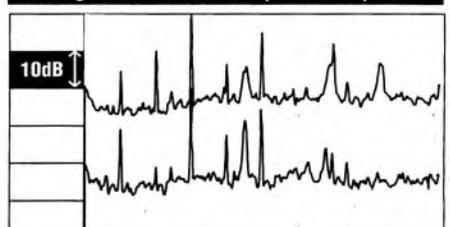
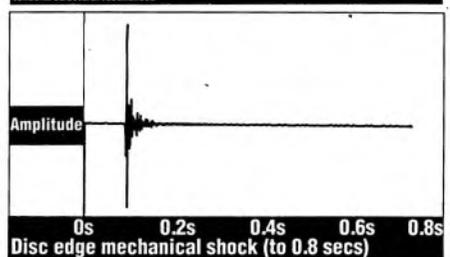
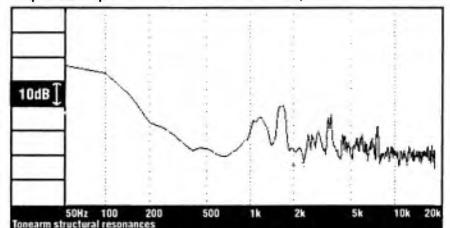
Type	suspended motor unit
Platter mass/damping	1.8kg/good
Finish and engineering	good/very good
Type of mains connection leads	captive 3-core from external PSU
Speed options	33/45rpm (with optional quartz PSU)
Wow and flutter (DIN peak Wtd)	0.14%/0.19%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.20%/0.064%
Absolute speed error	-0.19%
Speed drift 1 hour/load variation	+0.38%/0.92%
Start up time to audible stabilisation	3 sec
Rumble DIN B Wtd L/R/L+R	-77dB/-78dB/-80dB

### Arm section

Approx. effective mass inc screws, excl cartridge	13g
Type/mass headshell	integral/n/a
Geometric accuracy	very good
Adjustments provided	height/overhang/lateral
Ease of assembly/set-up/use	average/average/good
Friction (typical) lateral/vertical	<10mg/<10mg
Bias compensation method	thread & weight
Bias force, rim/centre (set to 1.5g elliptical)	200mg/180mg
Downforce calibration error 1g/2g	0.05g/0g
Cue drift	negligible
Cue rate ascent/descent	instant/4 sec
Arm resonances	good
Arm damping method	none

### System as a whole

Size (h x w x d)/clearance for lid rear	15 x 45.5 x 35.5cm/7cm
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	above average
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	good
Estimated typical purchase price	£365 (PSU: £130, Xenon MCS: £262.50)



# ARISTON Q-DECK

ARISTON ACOUSTICS LTD., FREEPORT SCOTLAND, PRESTWICK AIRPORT, PRESTWICK, SCOTLAND KA9 2TA. TEL: (0292) 76933.



The *Q-Deck* is designed to meet the non-specialist user at least half way. The player works almost straight from the box. There's no suspension to adjust; the arm is non-interchangeable; and an Ortofon *OM10* cartridge is supplied fitted. Speed change is by a discreet dome switch, the motor being driven by a simple L-C oscillator.

Operationally the deck is simple to use too, though it doesn't offer full automation. Moving the arm towards the record switches the motor on, and at end of side the arm lifts and the motor cuts, triggered by a frictionless magnetic switch.

The plinth consists of a plain sheet of Q-board. This is a laminate of medium density fireboard (MDF) with an (unspecified) visco-elastic filling, as a combination offering particularly good damping. The main bearing is now a sealed, captive unit, simplifying setting up further, and the arm is bolted to the Q-board in the familiar Rega pattern. The whole unit sits on compliant feet. The platter, topped by a thick rubber mat, is a heavy and well engineered one piece alloy casting with finger holes to allow access for the belt. The arm itself is a straightforward Japanese sourced OEM device, with a small diameter main tube and bolt-on cast metal headshell.

## LAB REPORT

Wow and flutter measured an excellent 0.06 per cent, what there is being more wow than flutter due to the considerable platter inertia. The test sample ran a little fast, but there was absolutely no drift. The deck did slow quite substantially under load, however, and some dynamic wow could sometimes be sensed though not heard on transient, pitch sensitive music.

Rumble levels are satisfactory, and the deck has a quite good impulse response, though feedback is a little selective frequency-wise. The tests otherwise suggest a well sorted machine with good bearings.

The arm is also notably well engineered. The only real criticism is that arm lead capacitance is rather high for some of the moving magnet cartridges that may be used in such a deck. The arm resonance plot shows that the first main tube mode is delayed until 1kHz, which is better than some £300 arms achieve and extremely good for a budget arm. A sharper peak at 2kHz, however, dominates the plot, but other resonances are quite well distributed and therefore likely to be innocuous enough.

## SOUND QUALITY

Sonically tainted by the occasionally brash sounding *OM10* cartridge, the *Q-Deck* is basically smooth sounding, with mildly restrained but still acceptable dynamics, a well upholstered bass, and a fine sense of timing on rhythmically 'difficult' material. Pitch information was stably presented. Whilst the deck sounded a little understated at times, music sounded varied and interesting.

The *Q-Deck* compares favourably with its opposite number in the Dual hierarchy, the *CS-505*. In most comparisons the Ariston is the more heavyweight performer of the two. On the one hand it literally goes deeper in the bass and offers a firmer and more positive foundation, an ability that gives the Ariston a bigger, more generous quality, a finding that is at its most obvious with larger loudspeakers, naturally. At the same time, the Dual is blessed with what might be described as better acceleration. It sounds more compact and tauter with even less low frequency overhang. On the whole I believe the Ariston wins this particular match, but it's far from being a walkover.

## CONCLUSIONS

The *Q-Deck* is a artful and largely successful compromise which offers a solid and well integrated sound plus no nonsense engineering.

## TEST RESULTS

### Motor section

Type	belt drive semi-auto integrated player
Platter mass/damping	1.15kg/average
Finish and engineering	moderate
Type of mains connection leads	2-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.06%/0.13%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.12%/0.03%
Absolute speed error	+0.76%
Speed drift 1 hour/load variation	none/-0.95%
Start up time to audible stabilisation	2 sec
Rumble DIN B Wtd L/R/L+R	-65.5dB/-71.5dB

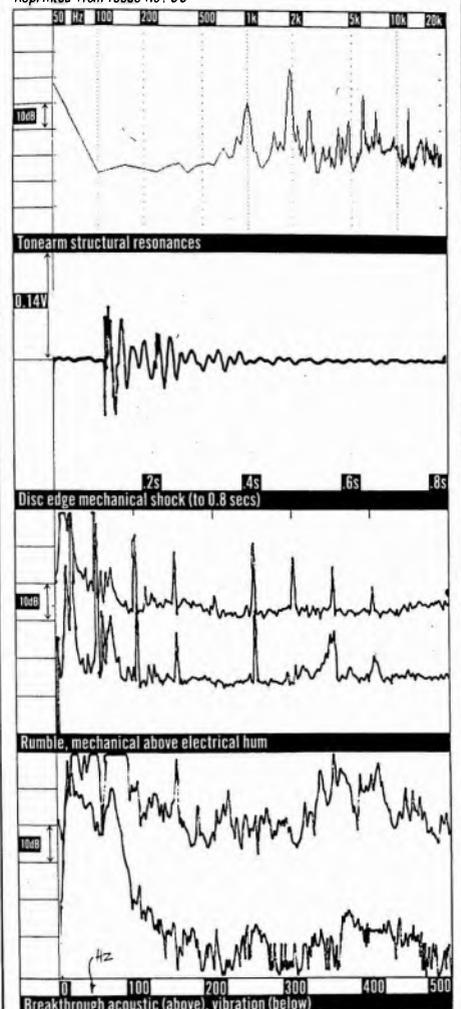
### Arm section

Approx effective mass inc screws, excl cartridge	n/a
Type/mass headshell	fixed
Geometric accuracy	average
Adjustments provided	overhang
Ease of assembly/set-up/use	good/good/very good
Friction (typical) lateral/vertical	25mg/25mg
Bias compensation method	spring & dial
Bias force, rim/centre (set to 1.5g elliptical)	140mg/170mg
Downforce calibration error 1g/2g	no error/no error
Cue drift	negligible
Cue rate ascent/descent	<0.5 sec/0.8 sec
Arm resonances	very good
Arm damping method	none
Load capacitance	170pF

### System as a whole

Size (h x w x d)/clearance for lid rear	13 x 42 x 34cm/7cm
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	good
Hum level/acoustic feedback	average/good
Vibration sensitivity/shock resistance	average/average
Estimated typical purchase price	£150

Reprinted from issue No. 55



# ARISTON FORTE

ARISTON ACOUSTICS LTD., FREEPORT SCOTLAND, PRESTWICK AIRPORT, PRESTWICK, SCOTLAND KA9 2TA. TEL: (0292) 76933.



Ariston has had a low cost skeletal turntable on its books for some years, and the *Forte* is a simple updating exercise based on the old *RD40* (Ariston wanted to get away from numbers, so they cleverly renamed it!) Depending on your tastes, you'll find that the *Forte* looks refreshingly original, or alternatively that it's been built inside out by mistake. Either way is justification enough to build it. The deck looks different and so carves itself out a special niche.

Another motivation behind the design is to produce a reasonably minimalist product heavy on engineering, and light on cosmetic frills. The deck is available with or without arm; it's tested here with Ariston's own *Enigma* arm, but is more often sold without. It's also available with either DC or AC motors. The former uses an outboard supply, but I gather this one doesn't sell as well in the UK, so we're looking at the mains-locked AC model here.

The cover-less deck consists of a one piece alloy platter driven via square section belt from the near-industry standard Impex synchronous motor. Speed change is manual and is simply accomplished by lifting the mat over an access hole in the platter and repositioning the belt.

The chassis is in two main components. One is a wheel-like cast subchassis with three spokes centred on the bearing housing, and which is now damped to inhibit ringing; an outrigger acts as the mounting point to which interchangeable arm bases are bolted. The fixed part of the chassis is also wheel shaped, and couples to the subchassis via three top-adjustable suspension towers. The bearing comes straight from the *RD90 Superior* and is a very high quality item.

The arm is a standard looking OEM design with a straight armtube, a fixed, offset headshell and simple bearing and counterweight systems. The *Enigma* should be a particularly good match for most of the better liked car-

tridges up to about £40-£50.

## LAB REPORT

The arm has no obvious bearing play, very low bearing friction and a well engineered bias mechanism, the level of bias increasing slightly on the inner grooves in accordance with theory. Geometry is good, and effective mass moderate, though certainly not low, so low to medium compliance cartridges suit best.

Turntable wow and flutter is acceptable without being especially good, and the deck runs rather fast – both are just noticeable on audition. Slowing under load is minimal, and rumble and motor breakthrough are adequate, but the platter rings very significantly, rubber mat notwithstanding, and decoupling through the suspension is rather frequency selective.

## SOUND QUALITY

The old *RD40* was a rather messy and confusing design, with an options list as long as your arm that made the deck something of a moving target. As the *Forte* it has settled down into something like maturity, and is almost as distinctive to listen to as it is to look at.

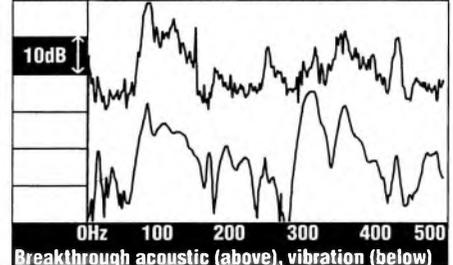
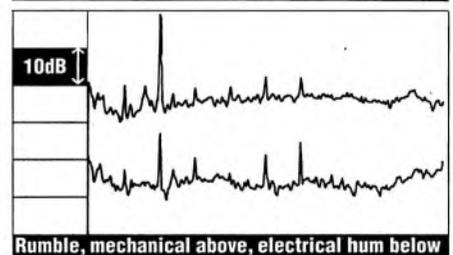
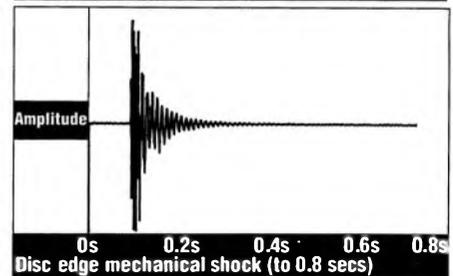
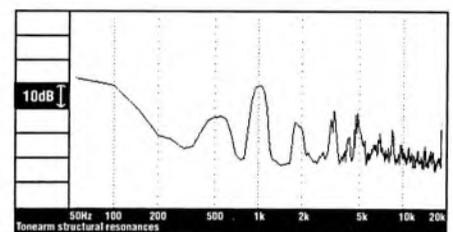
On the basis of quite extensive listening, I rate this deck as a tight, fast and punchy performer, albeit a trace 'metallic' (or at least forward) in presentation, though less so than its predecessors. The treble, dominated by the arm, isn't the best feature of the deck (the Rega *RB250* is said to match this deck very well), whilst the bass is oddly rubbery. It's there, or at least the upper and middle bass are there in force, but depth and attack seem slightly muted.

## CONCLUSIONS

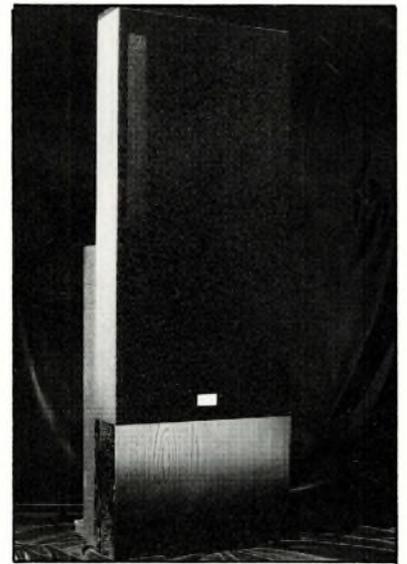
The *Forte* is an engaging and propulsive performer, with good attack but some shortcomings at the frequency extremes, and suspect speed stability: one to consider.

## TEST RESULTS

Type	manual belt drive player
Platter mass/damping	1.47kg/very poor
Finish and engineering	average
Type of mains connection leads	captive, 2-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.25%/0.32%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.32%/0.09%
Absolute speed error	+0.80%
Speed drift 1 hour/load variation	synchronous/-0.15%
Start up time to audible stabilisation	2.5 sec
Rumble DIN B Wtd L/R/L+R	-83dB/-83dB/-86dB
<b>Arm section</b>	
Approx effective mass inc screws, excl cartridge	10g
Type/mass headshell	fixed/n/a
Geometric accuracy	very good
Adjustments provided	lateral/overhang
Ease of assembly/set-up/use	very good
Friction (typical) lateral/vertical	10mg/10mg
Bias compensation method	dial
Bias force, rim/centre (set to 1.5g elliptical)	125mg/140mg
Downforce calibration error 1g/2g	0.05g/0.10g
Cue drift	very slight
Cue rate ascent/descent	instant/2 sec
Arm resonances	poor
Arm damping method	none
<b>System as a whole</b>	
Size (h x w x d)	13 x 42 x 34cm
Typical acoustic breakthrough and resonances	below average
Subjective sound quality of complete system	fair
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	below average
Estimated typical purchase price	£350 (£235 without arm)



*S* o m e A d v e n t u r e s —



*B* e g i n a t h o m e

OBS



A C O U S T I C S

SD ACOUSTICS 39-43 HIGH STREET NEW MALDEN SURREY KT3 4BY TEL: (01) 949 1623

AUDIO EXCELLENCE CARDIFF 02222 28565, GLOUCESTER 0452 300046 BRADY HI-FI LONDON 01 379 4010, WARRINGTON 0925 828009 GRAHAMS HI-FI LONDON 01 837 4412 NORMAN AUDIO PRESTON 0772 53057 K J LEISURE SOUND LONDON 01 486 R262 RADLETT AUDIO HERTS 09276 6497 LINTONE AUDIO GATESHEAD 091 4774167 CHEW & OSBORNE SAFFON WALDEN 0799 23728, EPPING 0178 74242 ACOUSTICS ARTS WATFORD 0923 245250 ISLAND HI-FI ISLE OF WIGHT 0983 61993 STANDENS TONBRIDGE 0782 353540 PAUL GREEN HI-FI BATH 0225 316197 BASICALLY SOUND NORWICH 0508 70829 ZEUS AUDIO BELFAST 0232 342522 ROBERT KING AUDIO CONSULTANTS LONDON 01 274 9081

# AUDIO TECHNICA AT1130

AUDIO TECHNICA LTD., TECHNICA HOUSE, LOCKWOOD CLOSE, LEEDS LS11 5UU. TEL: (0532) 771441.

RECOMMENDED



The AT1130 is based on the ultra-low mass AT1120, but has been completely redesigned in line with perceived market changes, though it is still a comparatively low mass design and still has an interchangeable headshell ("our customers want it" explained a slightly defensive sounding PRO). Structural improvements have been sought, with the result that the effective arm mass has increased from 5g to a still low 8.5g, while the ranges of acceptable cartridge weights is now 5g – 12g (it was 2g – 9g), which perfectly illustrates this change in emphasis.

In more detail, AT has included a calculated degree of compliance between the counterweight and arm, and also around the main bearing. The tapered armtube is damped internally, and the carbonfibre-loaded ABS headshell doesn't suffer from the potential microphony of metallic headshells. The output plug is now L-shaped to reduce the depth requirement. Build quality generally and rigidity in particular have both been improved, and the electrical circuit is fairly clean, with only two breaks.

A key feature of this (and other) AT arms is DTS – Dynamic Tracing System – in which the vertical bearing pivot is placed just below the plane of the disc, which therefore increases the downforce slightly as the stylus encounters higher drag – generally on heavily modulated grooves where tracking ability is most under stress.

The arm is finished in matt black and is well made and presented. The instructions are a model of their kind. The mounting is an SME-type sliding base, but this hasn't stopped AT from perforating the headshell with extended mounting slots for additional alignment purposes! A mounting template removes any ambiguity.

## LAB REPORT

Structurally this arm is extremely clean. Most resonances have been eliminated or

effectively damped – in contrast to the 1120. There are some small low-Q resonances way below 1kHz, which may be due to the decoupled counterweight, and some sharper ones at higher frequencies which probably relate to resonances in the fingerlift, in the break between the headshell and armtube and other fixtures and fittings. On the whole, however, the arm is very unexcitable, and 'sounds' very un-microphonic when handled too.

There appears to be some bearing play, though AT suggests that this is the damping around the bearings, not the bearings themselves. Friction levels are extremely low in both planes, and the 8.5g effective mass will suit virtually any cartridge, and in particular the higher compliance designs that are ill suited to today's predominantly higher mass tonearms. The tracking force calibrations are extremely accurate, but bias compensation levels are a little low at the recommended settings.

## SOUND QUALITY

Used mostly on a Source 50, which might be a shade out of its price class but is otherwise suitable, the AT is a clean, sweet sounding arm. The treble is particularly likeable for its naturalness and clarity, and also for its cleanliness through complex, heavily modulated passages, even near end of side. As promised, AT's unusual DTS geometry delivers the goods.

If the other end of the audio frequency band is less wonderful, it is never less than a fine and articulate sounding arm, and a consistent one that delivers the goods with a variety of moving magnets and low end moving coils. Nevertheless the arm does tend to sound a little shallow and occasionally blurred in the extreme bass, and a touch 'clothly' in the midband – the classic low cost arms of the Linn LIX school tend to have a meaner, better separated bass and a superior sense of

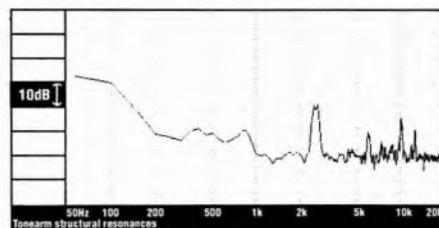
timing. But the AT is less coloured than most of these arms, and will prove particularly attractive to those for whom records often sound shrill or over-emphatic.

## CONCLUSIONS

Not faultless, the 1130 is nevertheless a good arm, intelligently conceived, well screwed together, and competent in its field, trading some dynamic qualities for the virtue of euphony.

## TEST RESULTS

Arm	
Approx effective mass inc screws, excl cartridge	8.5g
Type/mass headshell	detachable/3g
Geometric accuracy	very good
Adjustments provided	lateral, overhang
Finish and engineering	very good
Ease of assembly/set-up/use	average
Friction (typical) lateral/vertical	10mg/10mg
Bias compensation method	dial
Bias force, rim/centre (set to 1.5g elliptical)	60mg/125mg
Downforce calibration error 1g/2g	0/0
Cue drift	negligible
Cue rate ascent/descent	instant/3 sec
Arm resonances	good
Armdamping method	none
Estimated typical purchase price	£185.95





*From the perfectionists  
in sound, you could  
only expect the  
greatest names  
in sound...*

...and at Chew & Osborne, with nearly 30 years' experience in catering to our customers' discriminating requirements, we make certain that we only stock the names that will live up to these demanding criteria.



**Look at the Names**

- A&R Arcam • Ariston
- Audioquest Livewire
- Bang & Olufsen • BLQ • B&W
- Cambridge Audio • Denon
- Dual • Foundation Audio
- Gale • Harman Kardon
- Harman Kardon Citation • Kef
- Kenwood • Manticore
- Marantz • Meridian
- Mission Cyrus • Mordaunt Short • Musical Fidelity
- NAD • Nakamichi
- Pioneer • Quad
- Rogers • Ruark
- Sansui • Spendor
- Spica • Tannoy
- Yamaha — Plus

**Accessories from**

- Audio Technica
- DNM
- Goldring
- MIT
- Nagaoka
- PMB • QED
- Sennhelsler
- Target Audio
- Thats
- TDK
- WBT



**Look at the Music on Disc and Tape**

We've got everything you could ever need, including an extensive range of compact discs at prices to suit everyone, classical and popular naturally!



**And at Saffron Walden there's ABSOLUTE SOUNDS**

As the only specialists in Essex appointed by Absolute Sounds, you'll find it well worth a visit to see and hear this truly outstanding equipment. In stock now, you'll find • Apogee Acoustics • Krell and Sonus Faber • Micro-Seiki • Sicomin — including cables and interconnects.



**Look at the Service**

Professional, helpful, unbiased advice is only part of our service. For true peace of mind we back it with after-sales service which we believe is second to none.

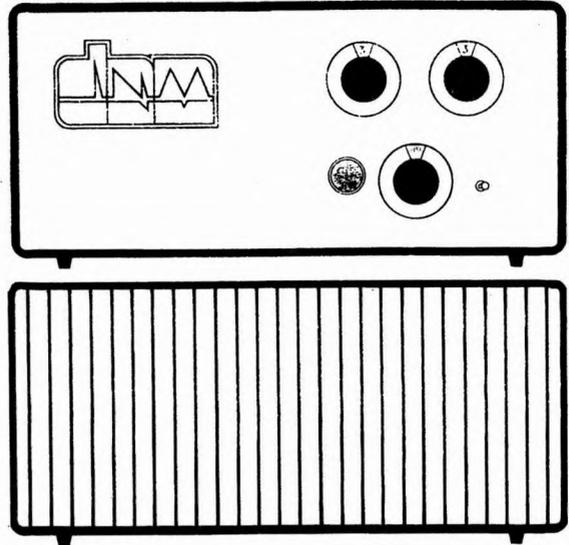


**Chew & Osborne**

EPHING, ESSEX, 148 High Street (0378) 74242  
SAFFRON WALDEN, ESSEX, 26 King Street (0799) 23728  
BISHOP'S STORTFORD, HERTS, 70 South Street (0279) 56401

*simply perfectionists in sound*

**DNM AUDIO AMPLIFIERS**



Above are outlines of our well-established DNM Pre and Power Amplifiers and like all things that have stood the test of time they have some very unique qualities.

These qualities derive from technical features such as total star earth circuit layouts and field effect design of component type and position. Even the semi-transparent acrylic case contributes to the performance.

These and many other technical features give real user benefits. Image and spatial capabilities are totally unique, enabling life-size solid images with suitable recordings. Even the less good multi-mixed recordings are more easily understood, thereby reducing listening fatigue. The stability and delicacy of the presentation allow an unforced naturalness and clarity combined with a great sense of power — astonishing from amplifiers that are so small.

DNM amplifiers combine handmade craftsmanship with advanced technology, so they are more expensive than ordinary ones. We believe they will bring you significantly closer to reality; surely the best possible reason for trying them in your hi-fi system.

To: DNM Design, 15 Highland Avenue, Brentwood, Essex CM15 9DD  
Tel: (0277) 225865  
Fax: (0277) 232486

Please send me further information on:

- 1. DNMAmplifiers
- 2. DNMSolid Core Cables
- 3. DNMConnectors
- 4. DNMAudio Capacitors
- 5. REHDEKO-DNM Imported Speakers

Name .....

Address.....

.....  
.....

# DUAL CS430

HAYDEN LABORATORIES LTD., HAYDEN HOUSE, CHILTERN HILL, CHALFONT ST. PETER, BUCKS. TEL: (0753) 888447.

RECOMMENDED



The CS503 never replaced the 505 as had been expected at one time. Indeed, the 505 has refused to lay down and die on numerous occasions, and the 503 instead became the forerunner for Dual's current 'budget' range. The £90 CS430 is the latest and cheapest derivative.

It's a semi-automatic turntable with manual arm setdown and auto-return. On our sample a small outboard transformer was integrated with a non-UK-standard mains plug; doubtless this will be put right for dis-bursing patrons. There's even a rudimentary 4-spring suspension, but springing is stiff and highly damped, so decoupling is limited.

Drive is from a high speed servo controlled DC motor via a precision flat ground belt through a plastic subplatter. Speed change is electronic, using a switch inconveniently positioned near the arm base, which is also home to the cueing lever. The subplatter is surmounted by a thin aluminium platter drilled with various access holes, plus a mat with label recess and annular rings on the back. Arm cueing is damped in both directions (just like the Linn Ekos!).

The arm eschews the dynamically balanced construction of other Duals; this is a lightweight design, low in engineering content, with conventional gravity tracking force and a pretty plasticky overall appearance.

The plinth, however, is extremely impressive for the price; very sophisticated manufacturing techniques have drastically reduced the tooling cost burden. The chassis uses a dual layer composite of foamed plastic and fibreboard, and is surprisingly heavy and 'dead'. An el-cheapo Ortofon-sourced Dual branded magnetic cartridge completes the package.

## LAB REPORT

In lab test terms at least, Dual has done its homework. The platter is well damped and structural breakthrough is reasonable,

though there is some coupling around 250Hz. There are no genuinely dominant structural resonant modes in an arm which appears to be well damped, probably as much by the relatively massive main bearing yoke as any other means.

Wow and flutter is even lower than for the 505, due mainly to a reduced wow contribution, whilst rumble is very low too, especially vertically. The arm bearings show the most obvious signs of cost cutting; friction is not particularly low despite significant bearing play.

## SOUND QUALITY

For me this turntable's performance is marginal. A weak, shambolic bass (a budget turntable characteristic) was matched to a splashy, gritty top end (mainly the fault of the cartridge) and a surprising lack of mid-range focus (this area appears to be largely the domain of the arm). A change of cartridge would clearly be a good start, but the £20 or so this will cost could push the total package price out of its class.

With the cartridge changed for a better one, the player is revealed as an adequate platform for systems of modest standards, and certainly well in line with price. The bass never really comes alive though, and the mid-band is always rather cluttered. It comes nowhere near to equalling the class excellence of the CS-505-3 - but then it doesn't cost that sort of money of course.

## CONCLUSIONS

The arm and platter are plainly built down to the price, but the plinth is a surprisingly sophisticated item that helps rescue the package from mediocrity.

It has to be said that it always sounded a touch loose and unco-ordinated, but the bottom line is that this deck offers a lot of grunt per buck invested. Recommended.

## TEST RESULTS

### Motor section

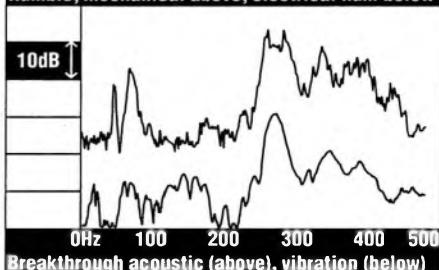
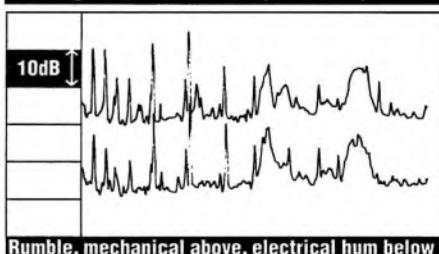
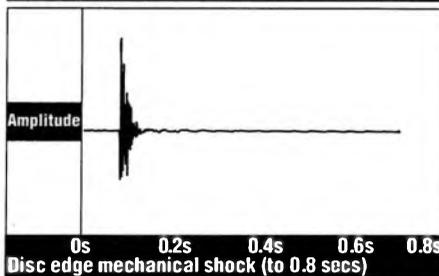
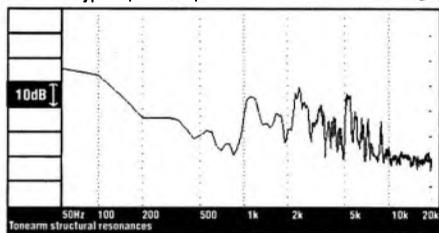
Type	belt drive, semi automatic integrated player
Platter mass/damping	380g/good
Finish and engineering	fair/fair
Type of mains connection leads	transformer in plug, detachable
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.09%/0.17%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.07%/0.056%
Absolute speed error	+0.25%
Speed drift 1 hour/load variation	+0.38%/—1.5%
Start up time to audible stabilisation	2 sec
Rumble DIN B Wtd L/R/L + R	—73dB/—75dB/—82dB

### Arm section

Approx. effective mass inc screws, excl cartridge	5g
Type/mass headshell	semi-fixed/n/a
Geometric accuracy	good
Adjustments provided	overhang/lateral
Ease of assembly/set-up/use	very good
Friction (typical) lateral/vertical	30mg/15mg
Bias compensation method	dial & spring
Bias force, rim/centre (set to 1.5g elliptical)	240mg/200mg
Downforce calibration error 1g/2g	—0.125g/—0.1g
Cue drift	negligible
Cue rate ascent/descent	4 sec/5 sec
Arm resonances	good
Arm damping method	none

### System as a whole

Size (h x w x d)/clearance for lid rear	12 x 44 x 36cm/3cm
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	below average
Hum level/acoustic feedback	average
Vibration sensitivity/shock resistance	fair
Estimated typical purchase price	£90



# Why shouldn't Hi-Fi look as good as it sounds?

After the launch of the uniquely styled CD-2000E...  
follow that!

And that's exactly what we have done

The Audio Dynamics Range now includes state of the art  
amplifier and tuner separates, designed to make the  
difference to your musical lifestyle.

The A-2080E integrated stereo amplifier hits new heights in  
styling and simplicity of operation.

The T-2000E AM/FM digital synthesiser tuner is the ideal  
choice for superb broadcast performance and beautifully  
matches the CD-2000E for sleek good looks.

At a stroke this outstanding new range from ADC delivers  
the finest in reproduction quality with the ultimate in  
design.

The Audio Dynamics Range – ~~nothing~~ else comes close.

## The new Audio Dynamics Range



# DUAL CS505-3

HAYDEN LABORATORIES LTD., HAYDEN HOUSE, CHILTERN HILL, CHALFONT ST. PETER, BUCKS. TEL: (0753) 888447.

BEST BUY



Having used and examined this and related models going back over the best part of a decade, I confess to being confused. The current version is recognisably similar to the very earliest, but I doubt if there are more than a handful of components in common. Sometimes it has seemed that the management at Dual has had to be dragged kicking and screaming into the 1980s. It took years to convince them that a flat rubber mat might be better than the original, and at least twice to my knowledge Dual have tried to discontinue this model in favour of inferior later designs intended to be built on much less labour intensive production lines. Yet steady if unspectacular progress has been made: the £140 1988 505 has never looked better, nor been better made.

The crowning glory of the born again 505 is a rather magnificent wood veneered plinth which is distinguished by smoothly rounded edges. The flat belt driven platter has lost its edge strobe markings, though a mechanical pitch control (on both speeds) is retained, uniquely working by expanding the diameter of the segmented motor pulley. The platter has an inner peripheral damping ring.

A 16-pole synchronous motor drives a vestigial plastic subplatter via a flat belt. Speed changeover is switched – an observation that would be superfluous for almost anything other than a turntable.

The arm is a good deal closer to its roots than the player. Using gimbal bearings all round, the narrow diameter armtube is fitted with a new carbon-fibre screw-on headshell. It's fully dynamically balanced with bias and tracking force applied by spring. The package is supplied with a 'freebie' Ortofon OM10 cartridge.

The Dual chassis is fully sprung for isolation purposes, and the semi-automatic operation includes auto armlift and motor cutout. Cueing resets to 'up' at the same time – a welcome and all but unique safety feature.

## LAB REPORT

The deck is extremely easy to set up and to operate, and performance shouldn't drift in use. The dynamic balance makes arm leveling relatively unimportant, and in principle the Dual can be played in any orientation – even upside down if the record is suitably restrained.

There is no perceptible play in the arm bearings which offer friction levels in both planes at the limit of measurement. The arm structural resonance plot places the first *serious* breakup mode at a surprisingly high 2kHz – which is just in the 'zing' area unfortunately; higher frequency behaviour is very good.

The well tried motor unit is equally hard to catch out. Speed stability is better than reasonable and signal/noise ratios are first rate. Several of the tests, however, indicate a degree of mild resonant excitability in the 400-450Hz range.

## SOUND QUALITY

The supplied OM10 cartridge has some obvious limitations; it's a little crude by the best standards and has limited HF tracking margins. This apart, the package sounds better than ever. On one level the Dual has a meatier, more solid presentation than before: the bass is more solid and meaningful. More importantly, I was struck by the integrity and expressiveness of the Dual: the excellent control through the midband and explicit pitch and timing in the bass and upper bass. The 505 goes a long way towards emulating the subtle strength of some notionally better, and more expensive decks.

## CONCLUSIONS

Continuing (comparative) excellence confirmed – Best Buy.

## TEST RESULTS

### Motor section

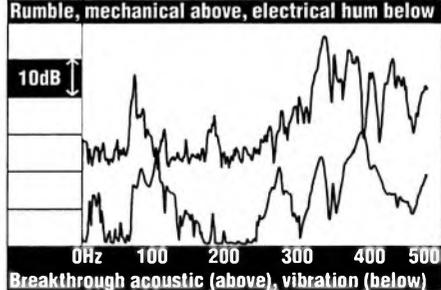
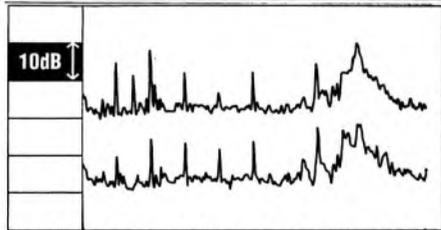
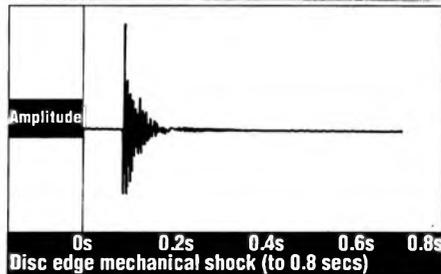
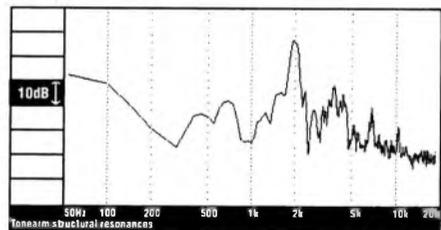
Type	belt drive, semi-auto integrated player
Platter mass/damping	815g/good
Finish and engineering	good/fair
Type of mains connection leads	2-core, captive
Speed options	33/45rpm (variable)
Wow and flutter (DIN peak Wtd)	0.10%/0.25%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.22%/0.064%
Absolute speed error	variable
Speed drift 1 hour/load variation	+0.24%/–1.1%
Start up time to audible stabilisation	3 sec
Rumble DIN B Wtd L/R/L+R	–78dB/–79dB/–81dB

### Arm section

Approx. effective mass inc screws, excl cartridge	8g
Type/mass headshell	semi-fixed/n/a
Geometric accuracy	very good
Adjustments provided	overhang/lateral
Ease of assembly/set-up/use	very good
Friction (typical) lateral/vertical	<10mg/<10mg
Bias compensation method	dial & spring
Bias force, rim/centre (set to 1.5g elliptical)	160mg/200mg
Downforce calibration error 1g/2g	–0.06g/–0.03g
Cue drift	small
Cue rate ascent/descent	2 sec/3 sec
Arm resonances	good
Arm damping method	none

### System as a whole

Size (h x w x d)/clearance for lid rear	14 x 43.5 x 57cm/3.5cm
Typical acoustic breakthrough and resonances	fair
Subjective sound quality of complete system	good
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	average
Estimated typical purchase price	£139.95 (inc. OM10 cartridge)



# HEYBROOK TT2 + ARM

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



Design-wise the *TT2* betrays a number of influences, most obviously from Linn Products and Thorens, but nevertheless shows good quality construction using high grade fastenings and materials. Obvious compromises, inevitable at the price, are restricted to areas like aesthetics and finish, which are adequate but dour. The plinth on the other hand is more solidly constructed than might be expected – it's heavy, being almost solid wood underneath. The diecast aluminium subchassis has an irregular cross shape, and is quite thick in section and well ribbed for rigidity. A laminated wood armboard is bolted in place and is readily interchangeable as required. The suspension, tuned to about 5.5Hz and essentially undamped, has the classic three springs, adjustable from above.

Power enters the system from a freestanding supply. Roughly finished in Nextel, with a front 33-off-45 switch, it is totally dedicated to the point of being captive wired to the turntable. Drive is transferred from the crown pulley of a 24-pole motor through a short flat belt, while the platter is conventionally designed, its inner section including a well tolerated rounded bearing that sits on a thrust pad.

The Heybrook arm has concentric gimbal bearings for the two planes. The large diameter armtube is made from aluminium and the headshell, incorporating a well designed fingerlift, is a magnesium extrusion. The bearings are designed to be tough, but there was some slack on the test sample at least. Internal wiring is a high purity copper and van den Hul *502* cable is used for the arm lead.

## LAB REPORT

Structurally the arm is extremely well behaved, almost defying analysis. There are no overriding discrete resonances at all, except in the highest couple of octaves. Mass

is highish, and only suitable for low compliance cartridges, whilst bearing friction is about average for a semi-budget design. The downforce calibration over-reads by about 20 per cent though, and finish is best described as modest.

Various structural and more prominent electrical artefacts were present on the rumble and hum plots, though the rumble figures measured to DIN B are fully satisfactory. Acoustic breakthrough and impulse responses both show some environmental excitability. However, the platter and mat damp record excitation extremely well. Both wow and flutter components are a little high, the weighted combined figure of 0.14 per cent being double that expected of a top rank design.

## SOUND QUALITY

Augmented with an Audio Technica *AT-F5* cartridge which suited this combination particularly well, the Heybrook played music with pace and poise. Bass weight was particularly good, and both dynamics and image scale were to a high standard. What really counts though is the fact that it was accomplished almost without overhang. Imagery was good too, but is not the Heybrook's strongest point as there is some loss of depth and 'air'.

The *TT2* is perhaps finally developing into what may have been intended all along – a kind of cut price Linn. The bass end, and with it that quality often described as authority, were present in abundance.

## CONCLUSIONS

The arm matches the turntable in more ways than one, and on present form, the combination has considerable poise and ability. Only slightly earthbound, it is clearly Recommended.

## TEST RESULTS

### Motor section

Type	manual motor plus arm
Platter mass/damping	2.8kg/good
Finish and engineering	below average/good
Type of mains connection leads	3-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.14%/0.20%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.17%/0.08%
Absolute speed error	none
Speed drift 1 hour/load variation	-0.06%/-0.70%
Start up time to audible stabilisation	3 sec
Rumble DIN B Wtd L/R/L + R	-80dB/-78dB

### Arm section

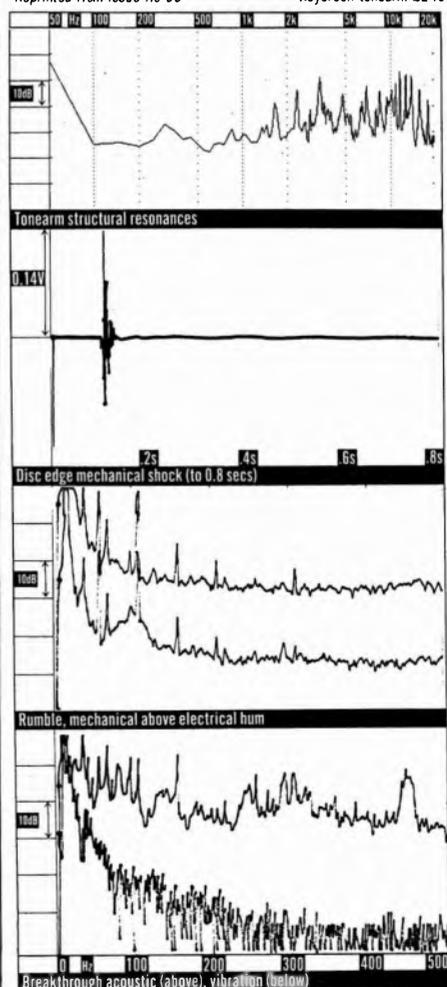
Approx effective mass inc screws, excl cartridge	14g
Type/mass headshell	integral/fixed
Geometric accuracy	average
Adjustments provided	overhang/height
Ease of assembly/set-up/use	average/average/good
Friction (typical) lateral/vertical	20mg/30mg
Bias compensation method	thread & weight
Bias force, rim/centre (set to 1.5g elliptical)	250mg/250mg
Downforce calibration error 1g/2g	+0.2gm/+0.2gm
Cue drift	poor
Cue rate ascent/descent	instant/8 sec
Arm resonances	excellent
Arm damping method	none
Load capacitance	110pF

### System as a whole

Size (h x w x d)/clearance for lid rear	44 x 36 x 16cm/6cm
Typical acoustic breakthrough and resonances	good
Subjective sound quality of complete system	good
Hum level/acoustic feedback	below average/below average
Vibration sensitivity/shock resistance	below average/average
Estimated typical purchase price	TT2 £349

TPS power supply £119  
Heybrook tonearm £249

Reprinted from issue No 55



# JVC AL-FQ555

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



The £170 AL-FQ555 is one of few remaining direct drive separate turntables. It's a particularly neat device too, with every kind of automation – auto arm control at startup and at end of side, auto record size sensing and auto speed selection (with an 'invert' switch to override the default selection); there's even output muting until the stylus is set down (which unfortunately introduces a break into the signal path). The automatics are triggered optically; a light near the arm base shines onto exposed windows let into the platter and mat, and thence to photo sensors. The platter is an adequate enough light-weight casting with light rubber mat.

The arm makes its contribution to fuss free setup by eschewing the usual adjustment points in favour of a T4P type interchangeable cartridge. No adjustments are normally needed since the T4P standard means that geometry and net tracking force with the cartridge installed are predetermined. Some control over bias, however, is desirable to take account of different stylus profiles, and is available on this player. The cartridge is a nameless OEM model, while the arm itself has a rather flexible wand with offset cartridge and simple bearings.

As so often with Japanese turntables, the plinth is made of relatively flimsy, microphonic plastics, and there is no suspension apart from the usual rubber feet. Ease of use, however, is excellent, not only because of the automatics, but also because all operating controls are forward of the lid.

## LAB REPORT

Why do JVC fit a platter edge strobe with an observation light that appears to be driven via the motor drive electronics? There's no means of adjusting the speed, and most errors won't show up anyway because inside the electronics loop both motor and lamp will presumably be equally affected by errors, and show no net error at all.

In fact the player runs at a very accurate set speed, and the benefits of direct drive are seen in the lack of slowing with time or under load. But another familiar direct drive characteristic is that wow and flutter are a little on the high side, especially wow. There are no complaints about rumble, however: the plot is clean, and platter damping is good. On the other hand, the player as a whole is rather susceptible to vibration breakthrough.

The arm's first structural breakup mode is below 1kHz, if quite well damped, but is followed by quite severe undamped peaks near 3kHz and 6kHz. Arm friction levels are quite low, yet there's significant bearing play.

## SOUND QUALITY

The cartridge proves to be a severe impediment to this turntable. Within the context of a rather dull, distant frequency balance, there is severe localised peakiness which led to some sharp ringing with certain percussion recordings. The bass is also rather poor, lacking articulation and any real sense of drive. It could also sound shallow, though this was partly a reflection of a cartridge which I discovered can be changed with good effect.

The best feature of the deck (apart from the automatics) is the midband, which sounds surprisingly good. This JVC's ability to separate the notes in fast runs is extremely good, and perceived clarity is another good point. But stereo imagery gave a rather caricatured left/right presentation.

## CONCLUSIONS

The '555 is a neat, granny-proof package that requires the minimum of setting up, and which can be readily improved by changing the supplied cartridge. Musically, however, it's something of a mixture, with a clean, articulate midband but a coarse, colourless treble and nondescript bass.

## TEST RESULTS

### Motor section

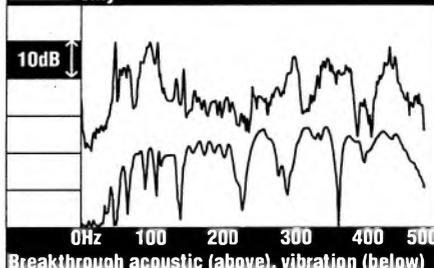
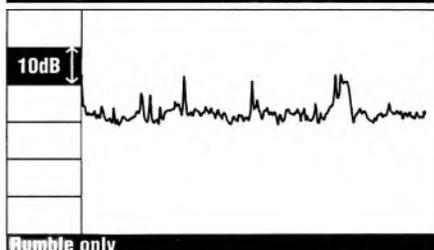
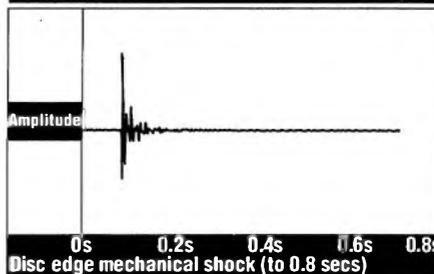
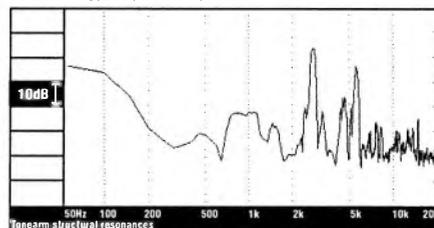
Type	automatic direct drive player (T4P)
Platter mass/damping	470g/good
Finish and engineering	good/average
Type of mains connection leads	captive, 2-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.14%/0.23%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.24%/0.08%
Absolute speed error	+0.13%
Speed drift 1 hour/load variation	none/none
Start up time to audible stabilisation	3 sec
Rumble DIN B Wtd L/R/L + R	-75dB/-73dB/-80.5dB

### Arm section

Approx effective mass inc screws, excl cartridge	5.5g
Type/mass headshell	fixed/n/a
Geometric accuracy	fair
Adjustments provided	none
Finish and engineering	fair/poor
Ease of assembly/set-up/use	very good
Friction (typical) lateral/vertical	20mg/10mg
Bias compensation method	calibrated dial
Bias force, rim/centre (set to 1.5g elliptical)	150mg/180mg
Downforce calibration error 1g/2g	n/a
Cue drift	small
Cue rate ascent/descent	1 sec/1 sec
Arm resonances	average
Arm damping method	none

### System as a whole

Size (h x w x d)/clearance for lid rear	11 x 43.5 x 36cm/none
Typical acoustic breakthrough and resonances	below average
Subjective sound quality of complete system	below average
Hum level/acoustic feedback	good/poor
Vibration sensitivity/shock resistance	average/poor
Estimated typical purchase price	£170



# Not only...



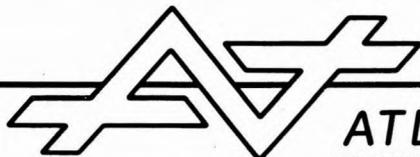
DEALER OF THE YEAR - LONDON

# But also...



A sincere thank you from everyone at AT Labs to Hi-Fi News readers and those who voted for us at the PENTA show. Its great to know good service means as much to you as it does to us.

  
TONY JONES  
MANAGING DIRECTOR  
A.T. LABS



## AT Labs



**AT Labs**  
173-5 Station Road  
Edgware  
Middlesex  
HA8 7JX  
01 952 5535

**AT Labs**  
159 Chase Side  
Enfield  
Middlesex  
EN2 0PW  
01 367 3132

**AT Labs**  
190 West End Lane  
West Hampstead  
London  
NW6 1SQ  
01 794 7848

**AT Labs**  
442-4 Cranbrook Rd.  
Gants Hill Ilford  
Essex  
IG2 6LL  
01 518 0915

# AT Labs

## Getting **BIGGER!**



## -by Being **BETTER!**

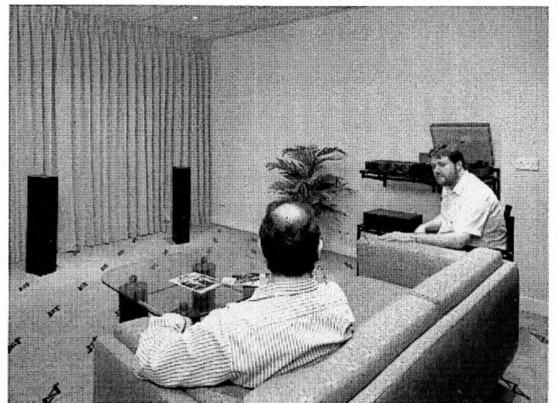


**AT Labs  
Edgware**

---

**NOW OPEN**

*Bringing  
REAL Hi-Fi  
to N.W. London!*



Now even more people can take advantage of our award winning service. **AT Labs Edgware** - the fourth **AT Labs** store - is now open. Like all our stores it has two demonstration rooms and is full of the leading names in Hi-Fi. Our experienced staff, as always, give friendly unbiased advice.



## AT Labs

**AT Labs**  
173-5 Station Road  
Edgware  
Middlesex  
HA8 7JX  
01 952 5535

**AT Labs**  
159 Chase Side  
Enfield  
Middlesex  
EN2 0PW  
01 367 3132

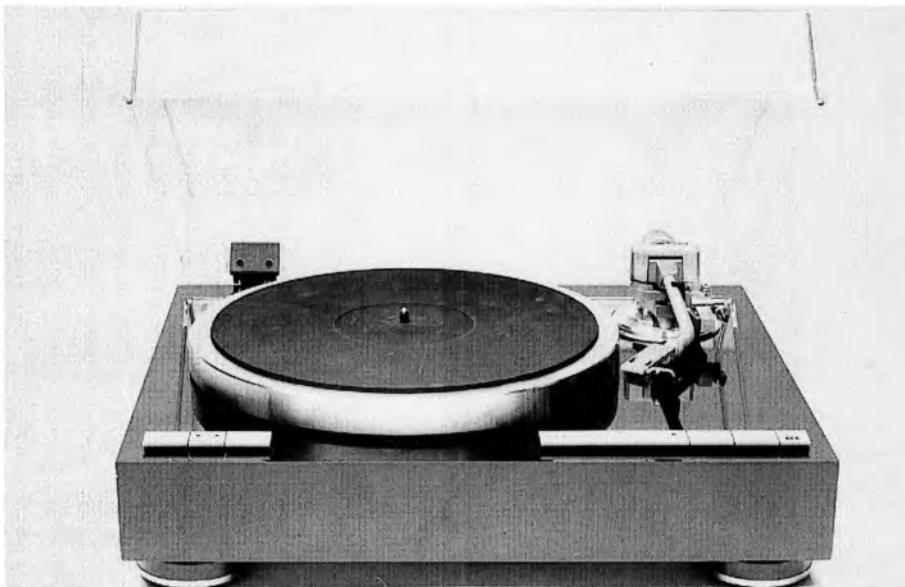
**AT Labs**  
190 West End Lane  
West Hampstead  
London  
NW6 1SQ  
01 794 7848

**AT Labs**  
442-4 Cranbrook Rd.  
Gants Hill Ilford  
Essex  
IG2 6LL  
01 518 0915



# KENWOOD KD-990

TRIO KENWOOD LTD., 17 BRISTOL RD., THE METROPOLITAN CENTRE, GREENFORD, MIDDX UB6 8UP. TEL: (01) 575 6030.



Available for some years in other markets, the *KD-990* only went on sale in the UK during the course of 1988. Slotting neatly in at £300 it is aimed at the buyer who wants a decent quality deck that is easy to set up and has the quality of presentation of the best of Japanese hi-fi.

The plinth has a massive plain carcass with a deep lustrous finish – not quite a true piano gloss – and sits on four large springy feet which are adjustable for levelling. The platter is an oversize rubber topped alloy item with two small finger holes. It's a friction fit on the spindle which is part of the quartz locked direct drive motor; a coreless, slotless low-cogging design. The motor is fixed to an alloy casting that also supports the arm in what Kenwood describe as a closed loop, but the subchassis – which is what it amounts to – is not separately sprung and isolated.

The arm is a massive affair, rather old fashioned in appearance, with a solid aluminium detachable headshell using the old SME/IEC type locking collar. The vertical bearing alignment is such that cartridge azimuth does vary over warps. The range of adjustments includes arm height.

The deck operates semi-automatically, with auto armlift and motor cutout at end of side. Everything else is manual, but assisted by a superb set of light-touch switches including a powered lift/lower.

## LAB REPORT

The arm is a massy 16g affair, and therefore only really suitable for low compliance cartridges (and preferably quite lightweight ones at that). Many popular cartridges drive the arm cartridge resonance down to the 6-7Hz region, tending to sound rather 'hung over' as a result. There is of course some scope for weight reduction if the headshell is changed for a lighter one.

The arm bearings are not a special

strength either. There is some bearing play and stiction, whilst friction levels are not as low as with many players in this price area. Structurally, the arm is quite well damped at high frequencies, and the first breakup mode appears around 1kHz, which is quite high for an arm with an interchangeable headshell. There is clear evidence of breakup modes around 3kHz and again between 5-6kHz.

The platter has plenty of inertia as much of the weight is spread around the significantly oversize periphery. But the one-piece construction militates against good damping, and indeed the platter rings for a considerable period following excitation. The player itself is naturally more microphonic than many suspended decks, but excitability never reached serious proportions.

## SOUND QUALITY

The *DP-990* has a tendency to 'read' the surface on which it stands, which should ideally therefore be small, stiff and light. A good wall shelf will work well, but the deck itself is larger than normal, so beware. Used with the usual Audio Technica *AT-F5* (which is on the edge of the compliance acceptability envelope) the Kenwood sounds homogeneous and powerful, with well presented stereo soundstaging and a neat, unobtrusive treble. Pitch stability is good too, and the deck certainly isn't over excitable, working unobtrusively in every sense. It's a pretty good deck, but nevertheless might be expected to sound a little more dynamic and alive considering the price and in comparison with competitors.

## CONCLUSIONS

There are some sonic compromises with this product but they're not severe. If music is the overriding criterion, you can do better elsewhere, but the controls, aesthetics and professionalism could still prove a powerful incentive to buy the *KD-990*.

## TEST RESULTS

### Motor section

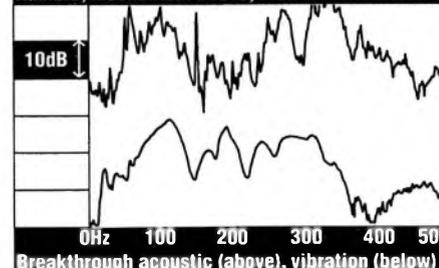
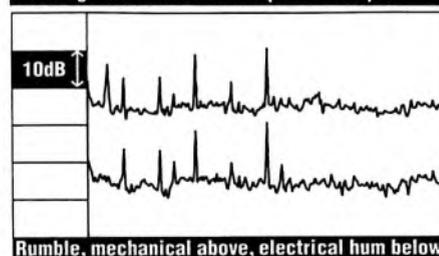
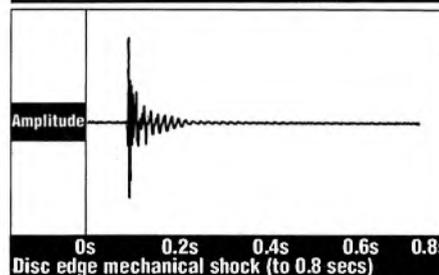
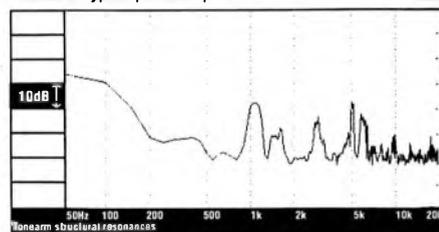
Type	semi-auto direct drive integrated player
Platter mass/damping	2kg/poor
Finish and engineering	excellent/average
Type of mains connection leads	captive, 2-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.11%/0.24%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.25%/0.05%
Absolute speed error	+0.19%
Speed drift 1 hour/load variation	negligible/-0.06%
Start up time to audible stabilisation	2.5 sec
Rumble DIN B Wtd L/R/L+R	-82dB/-82dB/-84dB

### Arm section

Approx effective mass inc screws, excl cartridge	16g
Type/mass headshell	detachable/11g
Geometric accuracy	very good
Adjustments provided	overhang, lateral, height
Finish and engineering	good
Ease of assembly/set-up/use	good
Friction (typical) lateral/vertical	25mg/15mg
Bias compensation method	thread & weight
Bias force, rim/centre (set to 1.5g elliptical)	100mg/100mg
Downforce calibration error 1g/2g	0/0
Cue drift	slight
Cue rate ascent/descent	1 sec/3 sec
Arm resonances	average
Arm damping method	none

### System as a whole

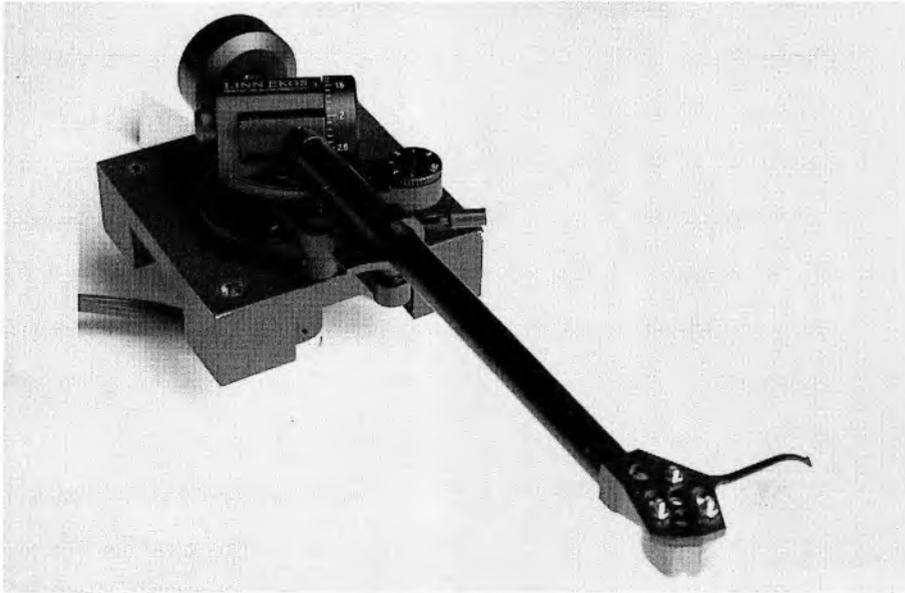
Size (h x w x d)/clearance for lid rear	18 x 49 x 41cm/7cm
Typical acoustic breakthrough and resonances	below average
Subjective sound quality of complete system	average
Hum level/acoustic feedback	average
Vibration sensitivity/shock resistance	poor
Estimated typical purchase price	£300



# LINN EKOS

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

RECOMMENDED



The cynic's view of the *Ekos* (from the French word *Ecosse*) is that it's a mildly souped up *Ittok* for more than twice the money. The second part of course is right – the *Ittok* sells for £429, the *Ekos* for £895 – but don't be fooled. Almost every component in the *Ekos* is new.

Linn says the *Ittok's* fundamentals were right, so why change them? Why indeed? So the *Ekos* has the same distinguishing features – a fixed headshell (with a third hole for the *Troika* cartridge), a wide armtube and strong(ish) bearings and so on. The arm is dynamically balanced; equilibrium is initially achieved by adjusting a stiffly decoupled counterweight, and then both bias and downforce are applied by spring.

The *Ekos* is the first arm Linn has actually built in-house from the outset. The claimed aim was to achieve something closer to the ideal of a stationary cartridge referred to the groove mean position, and the steps taken to achieve this include using stronger, more rigid materials, and joins with less give in them. An early decision was made not to follow the one piece arm/headshell bandwagon because Linn reckons that alloys with the required hardness can't be extruded or cast, or even machined without incurring a severe weight penalty.

To these ends, the *Ittok's* soft alloy headshell has been replaced by a solid machined item. The two armtube terminations are achieved with high technology glue (the *Ittok* is glued and screwed), said to make the *Ekos* 'more of a one piece arm than a one piece arm'(!) The armtube itself is a new ultra-hard alloy. The bearings have the same geometry, but again they're much improved in specification and tolerances, and are claimed to be the best currently available in both respects. Other changes include a new metal output plug (*not* cable) which is said to have a significant sonic effect. The armrest is no longer separate, and the lift-

lower device is damped in both directions to reduce the possibility of resonance. Build and finish are superb.

## LAB REPORT

You won't find the secret of this arm in the lab test measurements. All they do is to suggest that no great errors have been made. Effective mass is a very reasonable 9g, friction in both planes is at the limits of measurement, and not only is there no discernible slack within the bearings, they also feel incredibly strong. Bias and tracking force adjustments are calibrated with absolute precision. The first arm breakup mode appears around 1.2kHz (probably a beam bending mode), and although the armtube quietens down quickly thereafter, there are some odd discrete resonances, including a high Q one apparently attributable to the fingerlift.

## SOUND QUALITY

The *Ekos* was used mainly with the *Troika*, and on both Linn *LP12* and Pink Triangle turntables, in all cases with truly excellent results. In the best possible sense, the *Ekos* is like a much improved *Ittok*. The feature I noticed first was that bass was reproduced in full, glorious stereo. The *Ittok* bass was always punchy and tight, but it often wasn't very deep, and true LF information tended to reproduce with spatial cues muted. Similarly treble reproduction is improved. The old slight but significant tendency to stridency has been somewhat ameliorated.

In a more global sense the arm is more obviously homogeneous and less obvious as a mechanical tool for reproducing music. For the first time in a Linn arm, I hear the subtle layering and stereo abilities of the Rega *RB300*, but with traditional (or better!) Linn style large scale dynamics and weight. In this one special respect *Ekos* does emulate the strengths of a one piece arm. The *Ekos* lifts

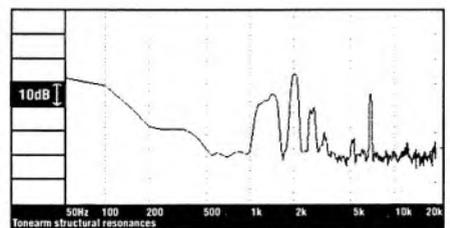
the performance of the *LP12* to new, previously unrealised heights, ironically in the direction of other front runners, notably the Pink Triangle and Roksan *Xerxes*, both of which have demonstrated superior stereo and resolution with suitable arms.

## CONCLUSIONS

The damped cue lift feature is a pain in the butt when used on a suspended player, but this apart the *Ekos* (like the *Ittok*) is the most practical and sensible of exotica. It takes Linn several steps further towards audio nirvana. Recommended.

## TEST RESULTS

Arm	
Approx effective mass inc screws, excl cartridge	9g
Type/mass headshell	fixed/n/a
Geometric accuracy	excellent
Adjustments provided	height/overhang/lateral
Finish and engineering	excellent
Ease of assembly/set-up/use	very good
Friction (typical) lateral/vertical	<10mg/<10mg
Bias compensation method	dial
Bias force, rim/centre (set to 1.5g elliptical)	140mg/170mg
Downforce calibration error 1g/2g	0/0
Cue drift	negligible
Cue rate ascent/descent	3 sec/3 sec
Arm resonances	good
Arm damping method	none
Estimated typical purchase price	£895



# MICHELL SYNCHRO

J. A. MICHELL ENGINEERING LTD., 2 THEOBALD STREET, BOREHAMWOOD, HERTFORDSHIRE WD6 4FE. TEL: (01) 953 0771.



Visually in keeping with the flagship *Gyrodec*, the more affordable *Synchro* is smaller, neater and undoubtedly better looking. Like its bigger brother, it's based on a massive acrylic base which stands on three adjustable feet, and which supports a subchassis via three upwards facing springs. This subchassis is an aluminium diecasting in the form of a spoked 'wheel' which supports the main bearing at its hub, and through that the felt-topped acrylic platter. The arm is mounted on an interchangeable baseplate on an outrigger. Most arms can be accommodated via conventional mounts that require rebalancing in the usual way.

The platter is driven around its edge by a thin rubber cord from a synchronous motor linked directly to the mains. Two pulley diameters enable the deck to run at 33 and 45 rpm, speed change being manual. The plinth (if you can call it that) has radiused corners which match the rounded off moulded cover, but the latter is rather microphonic and ideally should be removed for listening.

The *Synchro* has remained virtually unchanged in specifications since day one. The only change of note is that the coil springs are now terminated by PTFE 'O' rings, which are harder and said to sound better. A range of arm adaptor plates is available as suggested, and setting up is easy and unimpeded, but the majority of *Synchros* are sold with Rega *RB250s*. Students of trivia might like to know that Michell is the only OEM customer for the *RB300*, which can be supplied with this turntable if required.

## LAB REPORT

The *Synchro* was tested with a Michell arm, which is otherwise identical to the Moth arm. Despite a relatively lightweight platter, wow and flutter was excellent on test, the absolute speed error being a modest 0.1 per cent fast with well contained drift and slowing under load. DIN B rumble is more than satis-

factory. Shocks applied to the disc are well damped by the platter. The acoustic breakthrough plot is a bit peaky, whilst the impulse vibration breakthrough response is good except for one prominent mode around 200Hz. Electrical breakthrough is relatively high, however, partly because the structure of the deck and platter offer little electro-magnetic screening.

## SOUND QUALITY

There were initial difficulties achieving a hum free result with the Musical Fidelity test preamp, which is particularly fussy about the integrity of earthing arrangements, but once those problems were ironed out the deck performed to a high standard.

Pitch and image stability were firm and true, important prerequisites in both cases. The characteristic sound of the player is distinctive in the way it combines two major features: good resolution of fine detail, and a lack of obviousness that could be mistaken only until you notice that the *Synchro* also manages to sound outgoing and powerful, with good bass depth and transient attack, and excellent differentiation of subtle dynamic shadings, and between the different instruments in a mix. However, the *Synchro* did suffer from a small amount of overhang – the bass end never seemed to be totally quiescent.

It was noticed that the *Synchro* was more than usually responsive to the nature of the surface it was sat upon, and that a good lightweight, stiff surface – a classic turntable table say – did much to tame the bass. It also helped the deck in other ways, for example adding to the believability of the stereo illusion and by increasing perceived dynamic range.

## CONCLUSIONS

This startlingly attractive package is also a surprisingly clean sounding and capable one.

Available for use with almost any arm, it is an excellent vehicle for the Regas, the inherent hear-through clarity of the motor unit allowing the arm to do its job without masking.

## TEST RESULTS

### Motor Unit

Type	manual motor unit
Platter mass/damping	2.1g/good
Finish and engineering	very good
Type of mains connection leads	2-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.065%/0.11%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.11%/0.025%
Absolute speed error	+0.10%
Speed drift 1 hour/load variation	+0.29%/-0.41%
Startup time to audible stabilisation	2 sec
Rumble DIN B Wtd L/R/L+R	-76.5dB/-79dB
Size (h x w x d)/clearance for lid rear	16 x 47 x 34cm/10cm
Ease of use	good
Typical acoustic breakthrough and resonances	below average
Subjective sound quality of complete system	good
Hum level/acoustic feedback	below average/average
Vibration sensitivity/shock resistance	below average/average
Estimated typical purchase price	£265

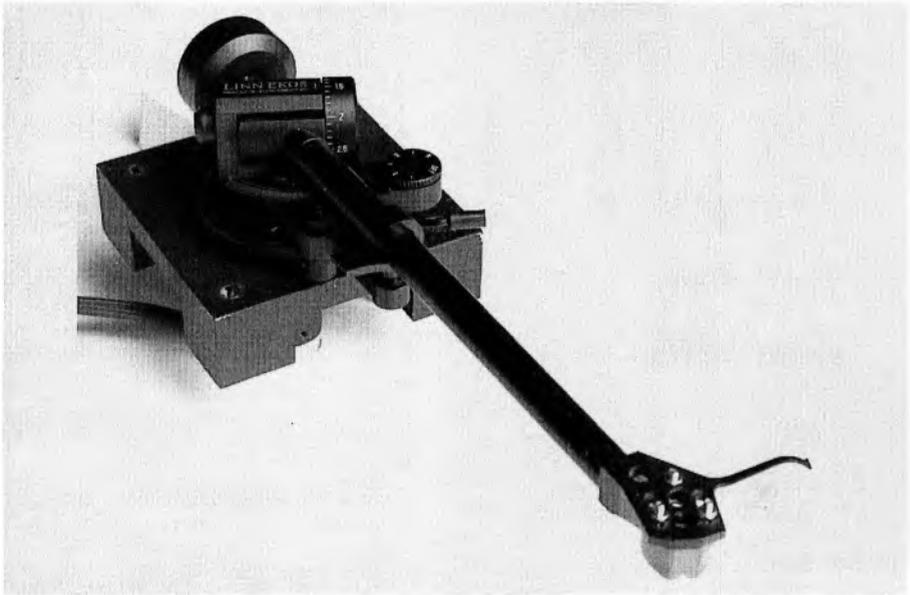
Reprinted from issue No 55



# LINN EKOS

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

RECOMMENDED



The cynic's view of the *Ekos* (from the French word *Ecosse*) is that it's a mildly souped up *Ittok* for more than twice the money. The second part of course is right – the *Ittok* sells for £429, the *Ekos* for £895 – but don't be fooled. Almost every component in the *Ekos* is new.

Linn says the *Ittok's* fundamentals were right, so why change them? Why indeed? So the *Ekos* has the same distinguishing features – a fixed headshell (with a third hole for the *Troika* cartridge), a wide armtube and strong(ish) bearings and so on. The arm is dynamically balanced; equilibrium is initially achieved by adjusting a stiffly decoupled counterweight, and then both bias and downforce are applied by spring.

The *Ekos* is the first arm Linn has actually built in-house from the outset. The claimed aim was to achieve something closer to the ideal of a stationary cartridge referred to the groove mean position, and the steps taken to achieve this include using stronger, more rigid materials, and joins with less give in them. An early decision was made not to follow the one piece arm/headshell bandwagon because Linn reckons that alloys with the required hardness can't be extruded or cast, or even machined without incurring a severe weight penalty.

To these ends, the *Ittok's* soft alloy headshell has been replaced by a solid machined item. The two armtube terminations are achieved with high technology glue (the *Ittok* is glued and screwed), said to make the *Ekos* 'more of a one piece arm than a one piece arm'(!) The armtube itself is a new ultra-hard alloy. The bearings have the same geometry, but again they're much improved in specification and tolerances, and are claimed to be the best currently available in both respects. Other changes include a new metal output plug (not cable) which is said to have a significant sonic effect. The armrest is no longer separate, and the lift-

lower device is damped in both directions to reduce the possibility of resonance. Build and finish are superb.

## LAB REPORT

You won't find the secret of this arm in the lab test measurements. All they do is to suggest that no great errors have been made. Effective mass is a very reasonable 9g, friction in both planes is at the limits of measurement, and not only is there no discernible slack within the bearings, they also feel incredibly strong. Bias and tracking force adjustments are calibrated with absolute precision. The first arm breakup mode appears around 1.2kHz (probably a beam bending mode), and although the armtube quietens down quickly thereafter, there are some odd discrete resonances, including a high Q one apparently attributable to the fingerlift.

## SOUND QUALITY

The *Ekos* was used mainly with the *Troika*, and on both Linn *LP12* and Pink Triangle turntables, in all cases with truly excellent results. In the best possible sense, the *Ekos* is like a much improved *Ittok*. The feature I noticed first was that bass was reproduced in full, glorious stereo. The *Ittok* bass was always punchy and tight, but it often wasn't very deep, and true LF information tended to reproduce with spatial cues muted. Similarly treble reproduction is improved. The old slight but significant tendency to stridency has been somewhat ameliorated.

In a more global sense the arm is more obviously homogeneous and less obvious as a mechanical tool for reproducing music. For the first time in a Linn arm, I hear the subtle layering and stereo abilities of the Rega *RB300*, but with traditional (or better!) Linn style large scale dynamics and weight. In this one special respect *Ekos* does emulate the strengths of a one piece arm. The *Ekos* lifts

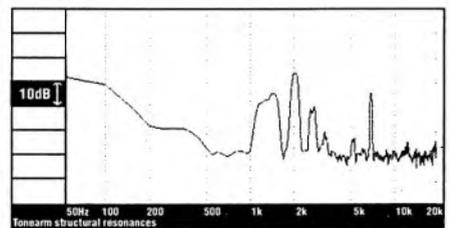
the performance of the *LP12* to new, previously unrealised heights, ironically in the direction of other front runners, notably the Pink Triangle and Roksan *Xerxes*, both of which have demonstrated superior stereo and resolution with suitable arms.

## CONCLUSIONS

The damped cue lift feature is a pain in the butt when used on a suspended player, but this apart the *Ekos* (like the *Ittok*) is the most practical and sensible of exotica. It takes Linn several steps further towards audio nirvana. Recommended.

## TEST RESULTS

Arm	
Approx effective mass inc screws, excl cartridge	9g
Type/mass headshell	fixed/n/a
Geometric accuracy	excellent
Adjustments provided	height/overhang/lateral
Finish and engineering	excellent
Ease of assembly/set-up/use	very good
Friction (typical) lateral/vertical	<10mg/<10mg
Bias compensation method	dial
Bias force, rim/centre (set to 1.5g elliptical)	140mg/170mg
Downforce calibration error 1g/2g	0/0
Cue drift	negligible
Cue rate ascent/descent	3 sec/3 sec
Arm resonances	good
Arm damping method	none
Estimated typical purchase price	£895



# NAD5120

HI-FI MARKETS, AXIS 4, RHODES WAY, WATFORD, HERTS WD2 4YW. TEL: (0923) 226499.

BEST BUY



This is a return match, because the 5120 was last reviewed by Martin Colloms in *Hi-Fi Choice* No. 40, and reprinted in No. 55. However, since that time the turntable has been through some production changes, one of which – to the main turntable bearing – is said to have addressed a significant weakness.

It's important to note that the 5120 has very few direct rivals at the price, the Dual CS430 being perhaps the closest obvious competitor. Under (inevitable) comparison, the NAD comes off the loser in a couple of areas – notably the lightweight plastic plinth moulding whose raised sides make cueing slightly awkward.

But the NAD does better elsewhere – on paper at least. It has an elegantly designed and highly effective coil spring, low resonance suspension (with captive locking transit screw), and an arm which can be removed and replaced by another fitted with a different cartridge (with pre-determined alignment) simply by plugging the assembly into what amounts to an arm pillar. The arm even provides adjustments for 'tuning out' the frequency and Q of the arm/cartridge resonance (it's factory preset for those who don't want to bother). In other respects too this deck is a delight for the inveterate fiddler.

The arm itself has a thin armtube married to plastic mouldings at both ends. It looks unpromising and has some torsional flexibility, but under-the-skin changes have resulted in better performance (see later).

Platter mass is largely provided by the thick rubber mat. The drive system is classic: a slow speed synchronous motor, flat belt and plastic subplatter being the main ingredients. Speed change is by switch, and normal operation is semi-automatic, with end of side armlift and motor cut-out enabling the deck to hold its own with the direct competition. An Ortofon OMP5E cartridge is also included in the package.

## LAB REPORT

This is an altogether better built deck than the somewhat shambolic 5120 of yore. Whereas the arm bearings used to be very poor, they are now essentially slack-free at the cost of only very moderate friction. The bias mechanism is well engineered and the variable resonance behaviour can be used to good effect in fine tuning subsonic behaviour. Arm structural behaviour, however, remains inevitably untidy.

Weighted wow and flutter measures 0.17 per cent, which is reasonable in relation to price; much the same applies to rumble with various spectral 'lines' at multiples of AC line frequency affecting the count. Platter analysis shows some fairly complex modes following excitation but with reasonably rapid damping. The bottom line on the suspension is that it is effective in relation to price, but that its behaviour is non-linear with regard to frequency.

## SOUND QUALITY

There has been real progress over the last couple of years. Although glimpses of the original fat bass, overblown midband and gentle, almost muted top can still be heard, it is as though someone has attacked the sound with a screwdriver.

The current 5120 is plainly tauter and better controlled. The top has more life, the midband more focus. Music starts and stops faster and the sound picture is altogether more energetic and meaningful.

## CONCLUSIONS

It's a Best Buy. Objectively the 5120 still lacks real resolution, and stereo imagery is over-wide and perhaps not sufficiently explicit. Yet it also has a real homogeneity combined with the sense of rightness and poise that makes music sound believable.

## TEST RESULTS

### Main section

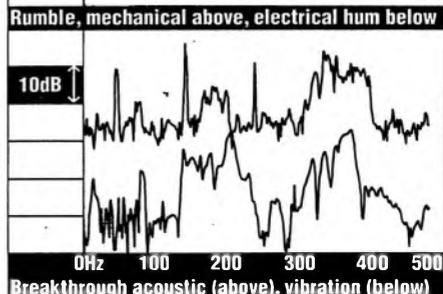
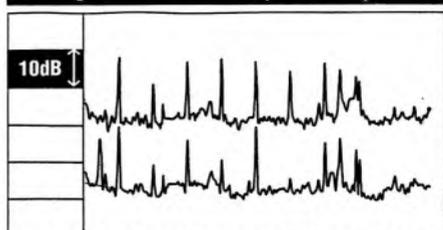
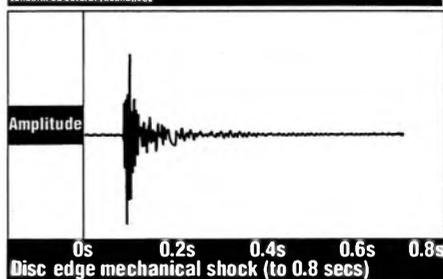
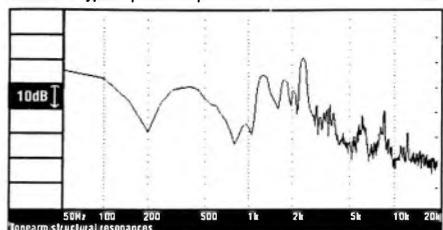
Type	belt drive, semi-auto integrated player
Platter mass/damping	1.2kg/average
Finish and engineering	average
Type of mainsconnection leads	captive, 2-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.17%/0.28%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.26%/0.052%
Absolute speed error	-0.13%
Speed drift 1 hour/load variation	synchronous/-0.6%
Start up time to audible stabilisation	3 sec
Rumble DIN B Wtd L/R/L + R	-74dB/-76dB/-77dB

### Arm section

Approx effective mass inc screws, excl cartridge	9g
Type/mass headshell	fixed/n/a
Geometric accuracy	good
Adjustments provided	LF resonance, overhang/lateral
Ease of assembly/set-up/use	good
Friction (typical) lateral/vertical	20mg/20mg
Bias compensation method	calibrated dial
Bias force, rim/centre (set to 1.5g elliptical)	200mg/200mg
Downforce calibration error 1g/2g	0/0.10g
Cue drift	negligible
Cue rate ascent/descent	instant/2 sec
Arm resonances	poor
Arm damping method	adjustable dashpot

### System as a whole

Size (h x w x d)/clearance for lid rear	42 x 35.5 x 11cm/3cm
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	average
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	good/average
Estimated typical purchase price	£89



# *Music is Beautiful*

Where elegance and science  
transcend the machine and its function...

Where the subtlety and intimacy  
of musical emotion is revealed...

Where the art of pleasing oneself  
finds no greater self expression...

Where ownership  
becomes an absolute privilege



## ORACLE

Oracle UK, 25 Heathfield, Stacey Bushes,  
Milton Keynes MK12 6HR,  
Tel: (0908) 317707, Fax: (0908) 322704

# OPUS 3 CONTINUO/DECCA LONDON INTERNATIONAL (REVISED)

PRESENCE AUDIO, THE OLD POSTHOUSE, PLUMMERS PLAIN, HORSHAM, WEST SUSSEX. TEL: (0403) 76777.



This exotic new £400 turntable, from the Opus records people, was supplied in late prototype form, with a number of rough edges which should have been addressed by the time the unit goes on general sale. It was supplied with two partnering items from the same distributor: the Decca/London cartridge and *International* tonearm. I did try a conventional AT moving coil, but this was in many ways less convincing than the London in this system.

The *Continuo* is a classic heavyweight design. The key component is an imposing 16kg plinth, made from coarsely crushed marble bonded and damped by resin. Another 7kg is accounted for by the platter, a smoother mix of crushed marble and polyurethane with a bonded felt mat. The deck has an inverted bearing with a ball running against the spindle. Drive is by low speed synchronous motor powered by a small outboard transformer (the one supplied looks inadequate, but will surely be replaced). The arm base is a truncated and inverted cone, friction fitted for rapid arm changeover. Springy feet provide the only isolation. The deck is manual in operation, achieving speed change by slipping the round section rim-drive belt between pulley sections.

jewelled unipivot which rocks alarmingly when handled, but is easy to set up with micrometer adjustment of critical settings like azimuth and a built-in spirit level. The bias mechanism is magnetic, and silicone fluid damping can be used. The arm is well enough made (excepting the crude, plastic headshell) but finish is unimpressive. 'Revised' refers to rewiring with high quality cabling.

## LAB REPORT

The test deck ran over two per cent slow and also gave excessive wow and flutter figures. The weighted figure here is little better than the unweighted one, suggesting that most of

the wobbles are within the 'most audible' area covered by the weighting curve. Acoustic breakthrough is rejected effectively, and structural transmission too shows a smooth spectrum, but with some increase around 2-300Hz. The platter is very well damped.

Arm friction levels are predictably low. Against this, bearing location is almost non-existent, and the tonearm can be driven rotationally near the LF resonance. The resonance plot shows a smooth, well damped structure at HF, but there are numerous LF modes, notably around 300Hz and 800Hz.

## SOUND QUALITY

Listening test results on this package were extremely equivocal, yet they often contradicted the 'iffy' lab performance. Dominating everything was the arm and cartridge, the latter sounding more tactile and alive than almost any cartridge available (this remember is one of the longest running designs ever produced), but set in a surprisingly firm yet distant and spacious acoustic. Stereo imagery is as individual as everything else.

Inherent instrumental separation is first rate and dynamic shadings are very cleanly presented, yet imagery lacks real variation in depth (Deccas are normally good at this), and also very obviously lacks focus. It's all rather amorphous, which in a way is not unlikelike. At the same time, there's never any trace of strain and volume levels can creep up a long way before the sound becomes obviously loud.

## CONCLUSIONS

The Opus/Decca shows flashes of brilliance, yet is tripped up in ways that even the cheapest self-respecting turntable should be able to sidestep. About all that can be said of the player itself is that it's 'big' in every sense, but that considerable further development is still required.

## TEST RESULTS

### Motor section

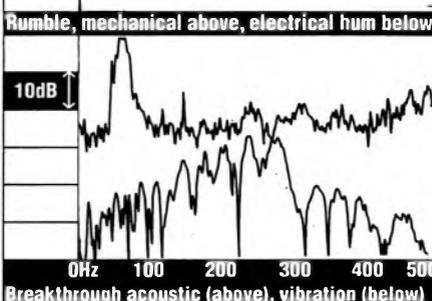
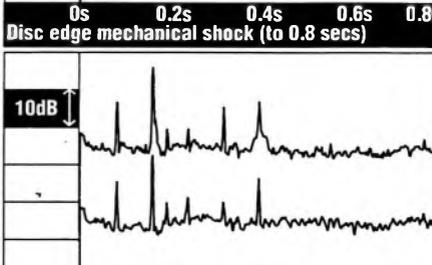
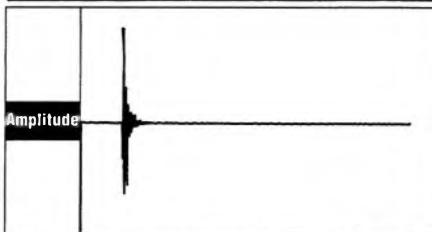
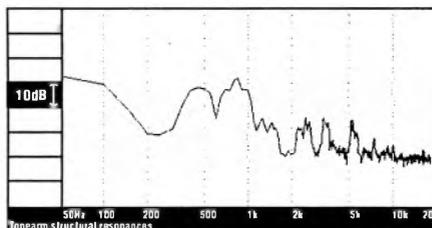
Type	manual belt-drive motor unit
Platter mass/damping	7kg/excellent
Finish and engineering	poor/good
Type of mains connection leads	detachable (transformer plug)
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.22%/0.27%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.29%/0.10%
Absolute speed error	+2.03%
Speeddrift 1 hour/load variation	synchronous/-0.03%
Start up time to audible stabilisation	4 sec
Rumble DIN B Wtd L/R/L+R	-63dB/-63dB/-63dB

### Arm section

Approx effective mass inc screws, excl cartridge	12g
Type/mass headshell	special detachable
Geometric accuracy	9.5g
Adjustments provided	height, tilt & overhang
Finish and engineering	fair
Ease of assembly/set-up/use	fair
Friction (typical) lateral/vertical	10mg/10mg
Bias compensation method	magnetic
Bias force, rim/centre (set to 1.5g elliptical)	150mg/300mg
Downforce calibration error 1g/2g	+0.1g/0.2g
Cue drift	n/a
Cue rate ascent/descent	n/a
Arm resonances	poor
Arm damping method	fluid bath

### System as a whole

Size (h x w x d)/clearance for lid rear	19 x 45 x 27cm/6.5cm
Typical acoustic breakthrough and resonances	excellent
Subjective sound quality of complete system	good
Hum level/acoustic feedback	below average/excellent
Vibration sensitivity/shock resistance	good
Estimated typical purchase price	£400 (motor); £100 (arm)



# COVENT GARDEN RECORDS

AT

# 84

**CHARING CROSS ROAD  
LONDON WC2H 0JA**

Tel: 01-379 7635/7427

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**

## SALE . . . SALE . . . SALE . . . SALE

**OVER £50,000 OF DEMONSTRATION STOCK MUST GO  
UP TO 50% OFF NORMAL PRICES**

OUR ENTIRE DEMONSTRATION STOCK OF CD PLAYERS, AMPLIFIERS, SPEAKERS,  
CASSETTE DECKS, ETC.  
ALL FULLY GUARANTEED.

UP TO 20% OFF EX-DEMONSTRATION SYSTEMS BY SONY, TECHNICS, PHILIPS  
AND OTHERS

EX DEMONSTRATION CD 150s FROM £79 (limited warranty)

**SALE STARTS 4th FEBRUARY 1989**

**FULL LIST AVAILABLE FROM 16th JANUARY 1989**

### COMPACT DISC SALE

**OVER 1,000 TITLES FROM PHILIPS, DECCA, DG ETC. AT £1 OFF**

**AND MANY OTHER BARGAINS**

**CD SALE STARTS 11th FEBRUARY 1989**

### QUALITY AUDIO

We stock an excellent range of some of the best Hi-Fi audio equipment and loudspeakers available from famous names such as B&W, Quad, Meridian, Mission Cyrus, A & R Cambridge, Rogers, Monitor Audio, Wharfedale, Sony, Nakamichi, Yamaha AKG, Sennheiser, Denon, Rotel, Marantz, Pioneer, Revox, Monster cable, Philips, Technics, Celestion and more.

**COVENT GARDEN RECORDS  
PRESENT**

**NOW IN STOCK AND ON DEMONSTRATION**

# MISSION ELECTRONICS

**New range of Mission Cyrus  
loudspeakers now in stock  
and on demonstration**

Mission PCM II CD Player  
Available with PSX Power Supply  
Cyrus 1  
Cyrus 2  
PSX

£499.00 The superb new CD Player, the PCMII and the  
£699.00 improved Cyrus 1 and 2 amplifiers. These  
£179.00 outstanding products set new standards for  
£299.00 reproducing music as it was performed. Now on  
£199.00 demonstration.

**£50  
OFF**

#### WHEN YOU BUY A CD PLAYER

Bring this coupon in during  
JAN/FEB 1989  
and get £1 off your next  
50 CDs over £6.99 this year  
This offer is also available  
on Audio Components over £500.

(Sale & Special Offers  
excluded)

84 Charing Cross Road, London WC2. Valid until end FEB 89



HFC 02/89

**£6  
OFF**

#### ON PURCHASE OF 5 CDs £9.95

84 Charing Cross Road, London WC2.  
No Tokens Given Valid to end FEB 89



HFC 02/89

**£1  
OFF**

#### ON PURCHASE OF 1 CD OVER £9.95

84 Charing Cross Road, London WC2.  
No Tokens Given Valid to end FEB 89



HFC 02/89



# ORACLE ALEXANDRIA Mk III

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

RECOMMENDED



To facilitate testing, the *Alexandria* was supplied with an SME *Series IV* arm, but arm bases are interchangeable to enable a range of other arm types to be used. Many of the design principles familiar from the better known *Delphi* appear in *Alexandria*, but this is no slavish copy. The deck looks more or less conventional, with a platter and arm base floated on a subchassis and a fixed, enveloping particle board chassis of standard proportions. The lid is an optional £125, on top.

The suspension is very close to the *Delphi* pattern. A massive, alloy subchassis is hung from three conical spring suspension units which can be adjusted from above, and which are normally covered by discreet black covers. The springs have different tensions, and can be changed to suit different weight arms.

The current *Mk III* version of the *Alexandria* is distinguished by a new low noise 12 volt DC motor, fed from an outdoor supply. A high speed, small spindle design drives an inner rim on the one piece platter by flat belt. In a departure from tradition, the platter is made of a synthetic composite material faced with a felt mat to which the record is clamped.

The clamp is a mild disadvantage, and so is the SME's awkwardly angled, stiff cueing lever which rocks the suspension. However, the row of three light touch controls for the two speeds and off is a delight; player finish is absolutely first class; the discreet Europeanised styling is a treat, as is the detailing and the 'piano gloss' black finish.

## LAB REPORT

The *Alexandria* measures predictably well. Motor isolation is excellent and the rumble spectrum clean. The measured level of rumble is high on one channel, but this appears to be a measuring fluke caused by noise leakage in the test rig, rather than a real problem. This Oracle is largely immune from acoustic

feedback, and coupling through the feet is highly effective, even in the context of high quality suspended decks. Excitation of the platter is quickly damped – an Oracle trademark – and there are no important resonances within the platter.

Wow and flutter measures reasonably low, but the level of linear wow is disappointing, though without obvious audible side effects. The deck has adjustable speed presets.

## SOUND QUALITY

I was taken aback by the *Alexandria*. I already know the *Delphi* (and indeed the SME *Series V*) and expected something close but not as good. What I actually discovered was a pairing that could weave spells – the two suit each other almost ideally. Whereas the SME *V* can be difficult to match into many systems, perhaps because it has quite a strongly characterised sound of its own, this is certainly not a problem in this case with the *IV*.

There are no important weaknesses. Although it's true that the system doesn't have quite the resolving power of, say, the Roksan/SME, it has a very homogenous, poised delivery. The bass is firm and extended, the treble is discernibly less glassy than the *Delphi*, and midband information is layered and positioned to perfection. Stereo imagery always was a strong point of the *Delphi*, and the *Alexandria* continues this tradition. Finally, and this perhaps is the deck's most valuable (but also most subtle) feature, the deck has a perceived noise floor that is subjectively lower than almost any other. The 'blackness between the notes' during, say, the Gustav Leonhardt *Art of Fugue* (on Harmonia Mundi) provides a perfect illustration of an ability which is related to the perception of dynamic range.

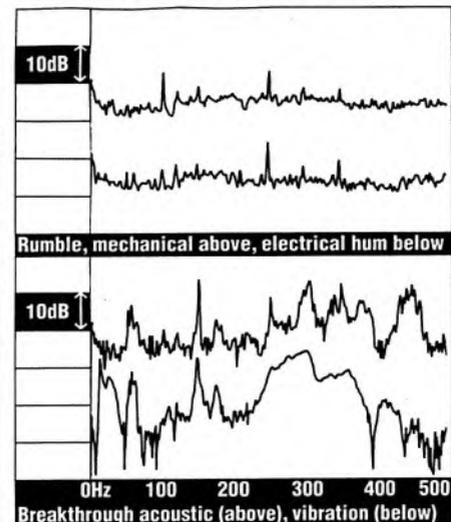
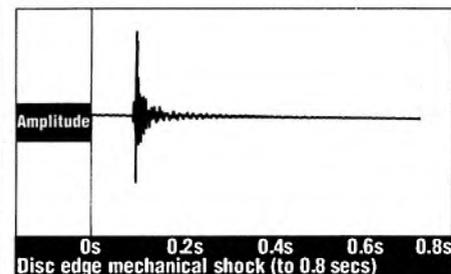
## CONCLUSIONS

Although both products were devolved from

more illustrious parents, this combination has a naturalness and euphony that is quite new, along with superb stereo and dynamics. All this *and* superb good looks!

## TEST RESULTS

Type	manual belt-drive motor unit
Platter mass/damping	2.5g/good
Finish and engineering	excellent
Type of mains connection leads	transformer in detachable lead
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.12%/0.25%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.24%/0.052%
Absolute speed error	+0.06%
Speed drift 1 hour/load variation	+0.02%/-0.03%
Start up time to audible stabilisation	2.5 sec
Rumble DIN B Wtd L/R/L+R	-58dB/-80dB/-81dB
Size (h x w x d)/clearance for lid rear	15 x 49 x 37.5cm/7cm
Ease of use	average
Typical acoustic breakthrough and resonances	excellent
Subjective sound quality of complete system	excellent
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	excellent
Estimated typical purchase price	£825-£995



# 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).

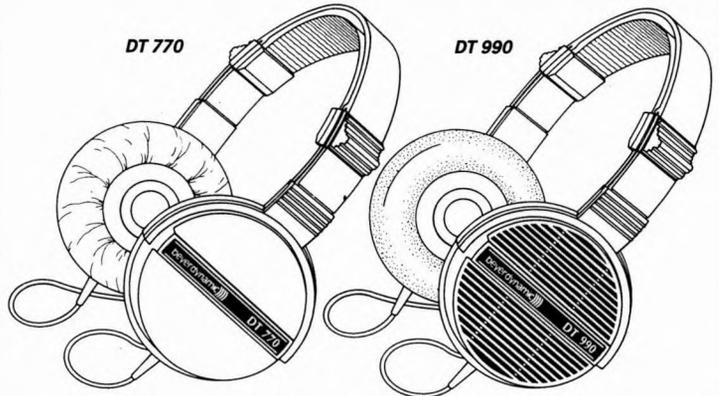
Perhaps we could persuade you that it will go nicely with other status symbols, like your Porsche.

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.

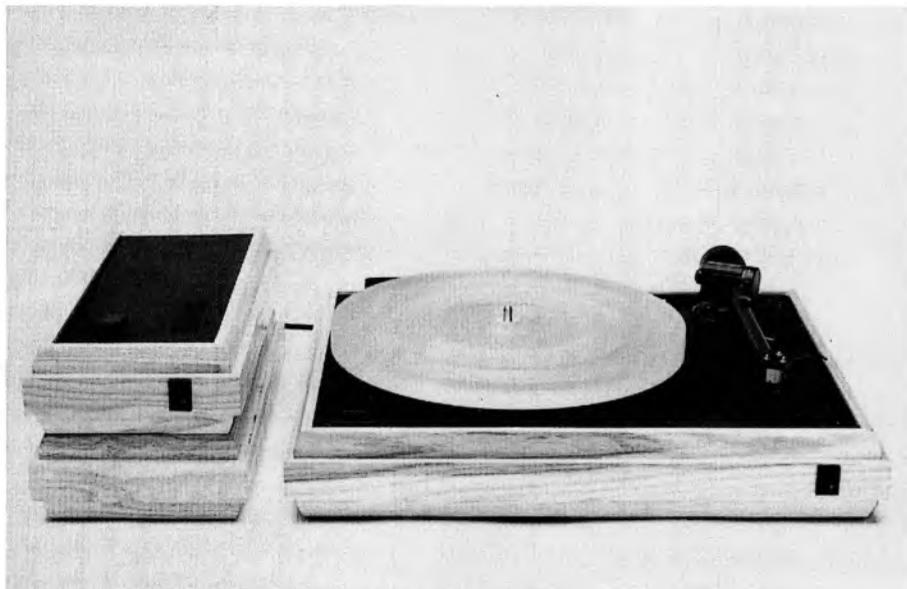
Need you hear more.



# PINK TRIANGLE PT TOO

PINK TRIANGLE PROJECTS LTD., 4 BRUNSWICK VILLAS, CAMBERWELL, LONDON SE5 7RR. TEL: (01) 703 5498.

RECOMMENDED



PT has perhaps never received full recognition for its contributions to the art and science of turntable design. The company was jointly first to employ acrylic as a platter material (with Goldmund), the first to use ultra-stiff, light Aerolam for the subchassis, and jointly first (with Sota) to use a jewelled main bearing. Inverted main bearings and hanging suspension systems aren't that usual either. But early PTs were plagued by teething problems with motors and elsewhere.

The *PT TOO* looks very similar to earlier models, but has nevertheless undergone a significant re-engineering programme. Pink has always laid special stress on the structural elements of the turntable, and also on the geometric relationship between the forces acting on it, and this accounts for the details already described, along with others such as the unusual mounting point for the motor (now a low speed AC type) near the front of the plinth.

The *PT TOO* is superbly presented. The test sample looked wonderful in light oak, and other finishes are available. Attention to detail is most impressive. It's also fairly simple to set up, partly because the suspension adjusters are accessed from the side and back and not below. PT also now offers an optional battery supply, production versions of which will sit alongside the outboard supply, and will recharge itself automatically. The only criticism is that the switch which provides 33 and 45rpm on successive depressions is extremely floppy.

## LAB REPORT

Given the absence of a platter mat and the fact that the record isn't clamped, it's not surprising that the platter is inclined to ring a little. The initial transient is quickly suppressed, however and the spectrum is clean below 500Hz (the limit of measurement for this test). Motor and electrical breakthrough are mostly low, despite the unfavourable

motor positioning. Acoustic breakthrough is low, and the deck responds quite well when shocks are transmitted through the suspension – the springing works.

The drive system has its strengths, including an accurate running speed and modest slowing under load (the old 'dynamic wow' ghost has been well and truly laid to rest, if it ever existed). Speed stability, however, is below par. Instability components in the wow spectrum (below 6Hz) are not much higher than normal, but the flutter measurement on our sample is flukeishly high and considerably short of the state of the art.

## SOUND QUALITY

I was intrigued to discover (this being my first in depth exposure to the Pink since the original) that the heavy technological content is mirrored in a surprisingly self-effacing influence on the music. Some decks in this project have been described as lean and quick; others have been called neutral. This is the one that defines the state of the art in both areas.

At its best I felt the *PT TOO* sounded quite like the Roksan *Xerxes*, in the sense that both are extremely high resolution designs; both have very explicit, almost holographic stereo; and neither seems conscious of that eternal bane of turntable design, overhang. If anything the Pink takes some of these attributes even further, though soundstaging isn't quite in the Roksan – or for that matter Oracle *Alexandria* class (the latter representing excellence of another kind). At its worst, however, *PT TOO* can sound almost too sharp and strident. The battery supply is well worth trying; it sounds slightly cleaner and adds some 3D to the stereo illusion.

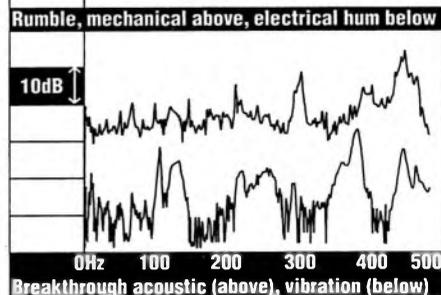
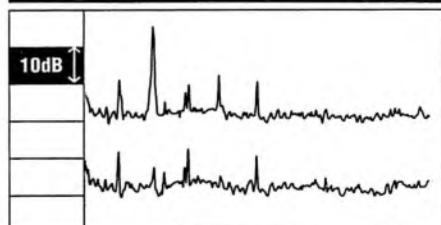
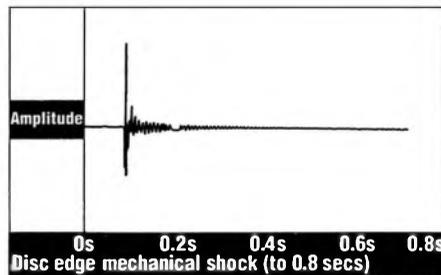
## CONCLUSIONS

Many will be surprised by this turntable. It throws the spotlight on the partnering system in an almost unnerving fashion. It was a

great success with a Linn *Ekos* during the test, but sounded almost indifferent with an old Logic arm. The almost CD-like presentation isn't always very euphonious, but few rivals allow greater access to the music, or can plumb more information more coherently from the groove. The high flutter needs to be tackled, however, if our sample is representative; Recommended nonetheless.

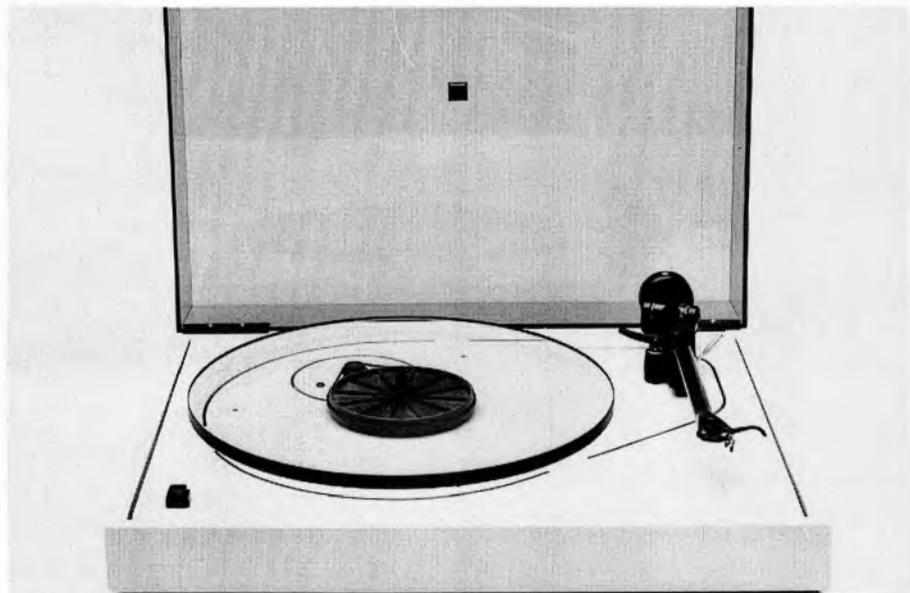
## TEST RESULTS

Motor unit	
Type	manual motor unit, outboard PSU
Platter mass/damping	1.65kg/below average
Finish and engineering	excellent
Type of mains connection leads	3-core captive, via outboard PSU
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.40%/0.46%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.15%/0.52%
Absolute speed error	-0.16%
Speed drift 1 hour/load variation	+0.15%/-0.44% (via mains)
Start up time to audible stabilisation	4 sec
Rumble DIN B Wtd L/R/L + R	-79dB/-81dB/-83dB
Size (h x w x d)/clearance for lid rear	15.5 x 45 x 39cm/7cm
Ease of use	average
Typical acoustic breakthrough and resonances	very good
Subjective sound quality of complete system	excellent
Hum level/acoustic feedback	very good
Vibration sensitivity/shock resistance	good
Estimated typical purchase price	£650



# SPLIT-SLAB MODIFICATION KIT FOR REGA

CS PRODUCTS, 35 HOWLAND WAY, REVELEY LOCK, RUSSIA DOCK EAST, LONDON SE16 1HN. TEL: (01) 252 1245.



The *Split-slab* kit is a replacement chassis into which you can drop your *RB300* or *RB250* arm and the main working bits of your Rega turntable, including the motor, main bearing, platter assembly and lid.

Safeguards are provided. If you don't like what you hear, you can return the kit for a refund. You don't burn any boats either. Nothing on the original Rega turntable is destroyed, and with a modicum of intelligence and a few simple tools, it can be reassembled as before. One important caveat, however, is that the instant you wield screwdriver to Rega, all that company's guarantees are null and void, even if a completely unrelated fault occurs with one of the original Rega components. It's between you and CS Products.

The kit is actually supplied in near complete form ready to accept the Rega transplant. It consists of a thick top plate which is home to the arm and platter, the assembly being resiliently decoupled from the rest of the plinth by four compliant rubber bushes. Motor decoupling is retained by fixing the motor to the chipboard base. The hinges are attached to a plinth outer which fastens to the base, which in turn is supported on three hollow rubber balls. The original Rega lid can be used without modification. A lot of clever detailed design work has been done, and the player has no obvious operational snags. You even get a new switch, because it can be hard to remove the pressfit original without damage.

Development work was being carried out on the hoof with this kit, which arrived with a vaguely Roksan *Xerxes* flavoured spiral-cut top plate, but which ended up with a discontinuous oval cut instead to prevent the possibility of sagging. The review sample could hardly be described as shop ready anyway: it had a painted finish and was plastered in pencil marks – though in fairness the standard of materials and build were surprisingly good. I take on trust that the kit will look the

part when in full production.

## LAB REPORT

The most dramatic difference between the *Split-slab* and a Rega *Planar 2* on the test bench was found in the acoustic feedback and external shock tests, both of which showed a massive reduction in energy transmission in the suspended deck at mid and high frequencies, though curiously there was rather more chassis coupling through the *Split-slab* below about 30Hz or so, and in consequence the raw rumble figures are higher for the *Split* version. Electrical breakthrough was similar, whilst the rumble spectrum favoured the *Split* version over much of the bandwidth. Other tests gave similar results, including disc edge excitation (where the Rega hardware scores well) and wow and flutter (ditto).

## SOUND QUALITY

Whatever other questions may arise about the *Split-slab* kit – and a number can be raised – there is no doubt whatever in my mind that it works. I ran a Rega *2* and *RB250* in parallel for comparison purposes, and found the *Split* version sounded quite different, especially in the LF region.

Audible character is completely changed, quantitatively as well as qualitatively. The bass has a much leaner, lighter balance as well as being faster, more tuneful and more explicitly separated. At the same time the deck acquires a more distant quality, which some listeners may well not like. But there's no loss of clarity (there's a considerable net gain in the bass), and the deck doesn't 'read' surfaces with anything like the standard item's enthusiasm.

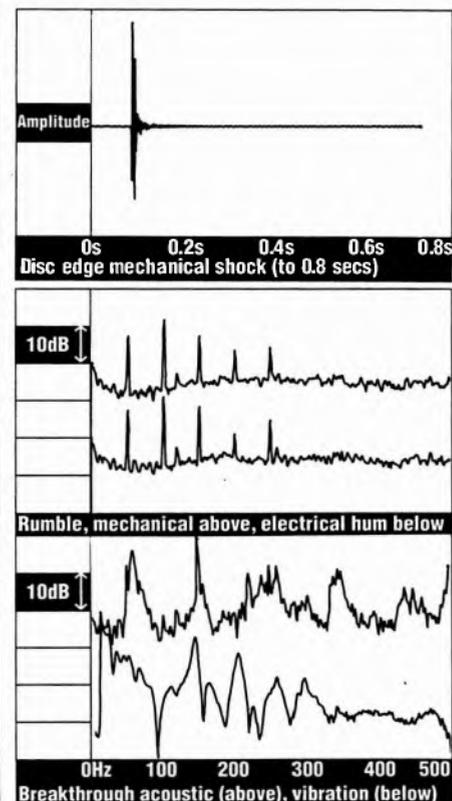
## CONCLUSIONS

Whether the kit trades on the Rega's success or is a homage to it I'll leave the reader to sort out. The important point here is that it

works. The deck consistently sounds more controlled and more informative than the Rega *2* I compared it to; although the gains may be smaller with the Rega *3*, I feel it's unlikely that the bottom line would be much different. The *Split-slab* kit is an economical and effective upgrade for Rega users. A formal recommendation is withheld, but only because we've not seen a fully representative production sample.

## TEST RESULTS

Motor unit	Chassis replacement kit for Rega
Type	1.7kg
Platter mass/damping	see text/good
Finish and engineering	captiv 2-core
Type of mains connection leads	33/45rpm
Speed options	0.084%/0.14%
Wow and flutter (DIN peak Wtd)	0.16%/0.048%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	+0.09%
Absolute speed error	synchronous/–0.56%
Speed drift 1 hour/load variation	4.5 sec
Start up time to audible stabilisation	–63dB/–64dB/–69dB
Rumble DIN B Wtd L/R/L+R	13 x 45 x 36cm/7cm
Size (h x w x d)/clearance for lid rear	good
Ease of use	good
Typical acoustic breakthrough and resonances	good
Subjective sound quality of complete system	good
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	good
Estimated typical purchase price	£73.95



# REVOLVER REBEL

SEE LTD., UNIT 5, BEWSEY BUSINESS CENTRE, BEWSEY RD., WARRINGTON WA5 5JU. TEL: (0925) 571173.



Some time ago I reviewed a sample of the Revolver which sported an odd lightweight platter. It was a quite thin sheet of plastic reinforced by a series of deep, concentric rings. The deck exhibited high levels of wow, and I also perceived a problem that the platter would tend to behave rather like a bell.

Next, I received a letter explaining: (a) that tooling for and making the plastic platter costs a lot more than the Revolver's usual Medite (b) that a lot of work had gone into the plastic, and although the reasoning remained confidential, it was 'possibly' not unrelated to some of Peter Belt's unorthodox thinking on electrical fields; and (c) that the wow and flutter was caused by a belt with varying diameter running in a V-groove motor pulley. The letter also claimed that platter bell modes were damped by using a 'peripheral wave trap' - the drive belt itself!

Next I receive a *Rebel*, Revolver's new budget player, which has just such a platter, slightly dished in profile and rim driven by a round section belt from a dual diameter pulley attached to a mains driven synchronous motor. It is topped by a felted card 'Starmat' mat. It is sold with a fixed headshell Japanese OEM arm, prefitted with arguably the best budget magnetic in its class - a modified AT95E. All the moving bits, even the motor, are rigidly attached to a wooden sheet resiliently decoupled from a more massive sheet that sits on feet. Finish is a high class textured grey paint, and the deck comes with a good quality lid.

## LAB REPORT

The arm is fairly typical of its *genus*. There is some bearing slack, though friction levels are very low, and some sub-assemblies - the cueing platform especially - are weak and resonant. The arm resonance plot shows fairly encouraging break up modes but is noisy higher up; taken in context, performance is good for the price.

Speed stability is not the *Rebel's* forte, the numbers suggesting more than merely subtle audibility. Whilst running, the belt kept riding up the pulley and then snapping back, a likely cause of some of the problem. Bearing noise is high, but improved towards the end of the test. Energy transmission through the plinth is on the high side, and frequency selective. However, Revolver appears to be right about the platter's bell modes at least. Platter rock and ringing are low though not absent, and record excitation is almost perfectly linear with frequency. The electrical noise plot should be ignored: the motor just doesn't like running without a load.

## SOUND QUALITY

I was impressed and disappointed alike by this design. Wow (low rate speed variation) was only a problem with some material, and is assumed not to be typical for the purposes of this discussion.

On my smaller, office system, I found the *Rebel* particularly engaging, revelling in its forward, explicit character and the punchy, almost clipped style of delivery. On the other hand, used in the higher grade, wide bandwidth system the forwardness was exposed as partly a manifestation of muddle, and deep bass was marred by a boominess, indicative of a loss of control. Adding confirmation to this observation, there was some deterioration of sound quality at high volumes.

## CONCLUSIONS

There are too many rough edges to warrant a Recommendation as it stands, the wow problem in particular being endemic and due to the design of the belt and/or motor pulley, and requiring rectification. But there's innovative thinking here, and the tantalising promise of something special lurking below the surface. There's a good cartridge too. This is a design to watch.

## TEST RESULTS

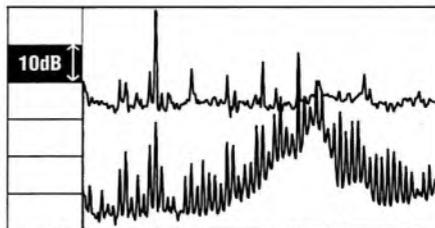
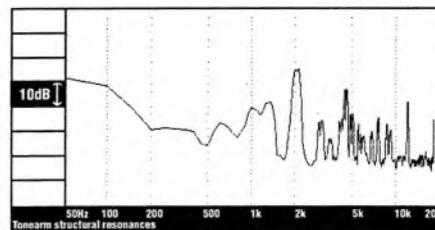
Type	manual, belt-drive integrated player
Platter mass/damping	620g/good
Finish and engineering	good/average
Type of mains connection leads	3-core, captive
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.25%/0.40%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.40%/0.18%
Absolute speed error	+0.16%
Speed drift 1 hour/load variation	synchronous/-0.41%
Start up time to audible stabilisation	1 sec
Rumble DIN B Wtd L/R/L + R	-65dB/-65dB/-73dB

### Arm section

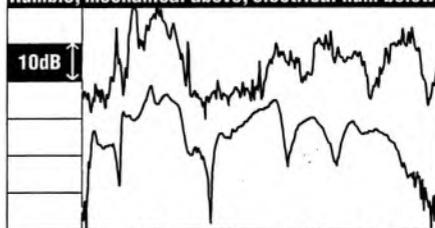
Approx effective mass inc screws, excl cartridge	13g
Type/mass headshell	fixed/n/a
Geometric accuracy	good
Adjustments provided	overhang/lateral
Ease of assembly/set-up/use	average
Friction (typical) lateral/vertical	10mg/<10mg
Bias compensation method	dial
Bias force, rim/centre (set to 1.5g elliptical)	190mg/220mg
Downforce calibration error 1g/2g	0g
Cue drift	slight
Cue rate ascent/descent	1 sec/1 sec
Arm resonances	average
Arm damping method	none

### System as a whole

Size (h x w x d)/clearance for lid rear	13 x 42 x 36.5cm/8cm
Typical acoustic breakthrough and resonances	poor
Subjective sound quality of complete system	average
Hum level/acoustic feedback	fair/average
Vibration sensitivity/shock resistance	below average
Estimated typical purchase price	£160



Rumble, mechanical above, electrical hum below



Breakthrough acoustic (above), vibration (below)

# ROKSAN ARTEMIZ

ROKSAN ENGINEERING LTD., 21 DOOLE RD., LLANDRINDOD WELLS, POWYS LD1 6DF. TEL: (0597) 4911.



The basis of the £350 *Artemiz* – the first ever tonearm from the makers of the *Xerxes* turntable – is a cross-shaped yoke whose vertical bearing operates in the plane of the record. Each bearing consists of three 2mm balls press fitted to the yoke at the bearing points; single 1.5mm balls set in cones on the end of screws that project through the bearing housing bears onto the centre of the fixed section. The bearing assembly is very small with very low velocity sliding areas, which is claimed to be responsible for intrinsically very low noise.

The armtube is a uniform wide aluminium tube, with the headshell press formed. There's only one structural break, just forward of the bearing housing.

Uniquely, the uncalibrated counterweight is suspended in a unipivoted cradle on an adjustable carrier on the arm's rear extension, and can therefore be lifted clear. The design is such that arm accelerations don't immediately rotate the counterweight around the arm pivot point and reduced effective mass in both planes is claimed. Bias is applied by a thread and weight system which in turn bears on a small spring (!), in a configuration intended to vary bias force across the record roughly in the manner dictated by theory.

Arm cabling is Isoda (which Roksan also distributes) which employs aluminium and brass as well as copper cores. The arm is well made and finished, and handles slightly unusually in that the stylus will always set down in the run-in groove, even if cued over the area outside the record edge.

Arm installation requires a single hole which (coincidentally or otherwise; Roksan says the former) happens to work with Rega type cutouts if the arm pillar is pushed against the side of the hole facing the main spindle. *Artemiz* is therefore one of very few convenient upgrade alternatives for a player already using a Rega arm.

## LAB REPORT

*Artemiz* offers a high standard of rigidity and moderately low mass. One side effect of the hanging counterweight is that the weight to bearing distance – and hence the downforce – varies as the arm rises and falls over record warps. Regrettably, downforce is at a minimum as the stylus rides the crest of the warp and vice versa, so this inevitably reduces tracking margins, albeit only by a little.

The bearings themselves were over-tight and notchy as originally supplied, but were adjusted to the manufacturer's directions (probably ending up a little too loose). But some slack is engineered in and is automatically taken up when the arm is playing a record (says Roksan). The high bearing frictions levels shown were measured before the adjustment had been made, and this accounts for some of the excessive HF 'noise' on the structural resonance plot. The rest is probably due to inadequate structural damping.

## SOUND QUALITY

The arm was auditioned on a Roksan *Xerxes* of recent vintage, with the usual Audio Technica and Koetsu *Rosewood Signature* cartridges, amongst others. Sonically and musically I find it has something approaching star quality.

Against the firmament of arm design generally, *Artemiz* is sharply delineated with a tuneful, propulsive bass and a lean, tidy mid-band. It has good perspectives and excellent separation. But treble quality is over-energetic, and this lends the arm a slightly over-emphatic quality, with transients perhaps too explicitly etched. The arm as a whole is too lean in balance to be totally convincing.

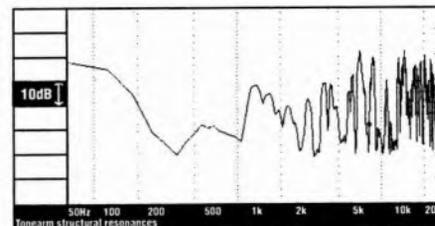
## CONCLUSIONS

Roksan claims that initial response to *Arte-*

*miz* has been extremely strong, and that they're likely to be back-ordered for some time. Roksan is talking real numbers too. By my reckoning *Artemiz* is a fine arm with a distinctive and informative character, but it needs further development before its full potential is realised.

## TEST RESULTS

Approx effective mass inc screws, excl cartridge	8g
Type/mass headshell	integral/n/a
Geometric accuracy	very good
Adjustments provided	overhang, lateral
Finish and engineering	excellent/very good
Ease of assembly/set-up/use	good/average/good
Friction (typical) lateral/vertical	250mg/100mg
Bias compensation method	adjustable spring & thread
Bias force, rim/centre (set to 1.5g elliptical)	150mg/200mg
Downforce calibration error 1g/2g	n/a
Cue drift	negligible
Cue rate ascent/descent	instant/3 seconds
Arm resonances	below average
Arm damping method	none
Estimated typical purchase price	£350



# ROKSAN XERXES

ROKSAN ENGINEERING LTD., 21 DDOLE ROAD, LLANDRINDOD WELLS, POWYS, WALES LD1 6DF. TEL: (059) 4911.

RECOMMENDED



The Roksan *Xerxes* is a 'clean sheet' design which throws many of the clichés of turntable design overboard. Development has been rapid in the last couple of years, and not only is recent production substantially better turned out than before, there have been important engineering changes, notably to the spindly main bearing which is now a meticulously engineered three-piece design. All such mods are retrofittable – at a price. The Roksan is available in many arm fittings (forget armboards – the entire top plate must be changed), and various high quality veneers.

A normal spring suspension is eschewed in favour of a stiffly floating top surface, sawn part through to control panel modes. The felt-topped platter is a complex and superbly engineered medium weight structure with high inertia, and the synchronous motor is allowed to rotate about the pulley axis against a spring, but is restrained in other planes. The key idea, which also finds expression elsewhere in the design, is to live with resonances by placing them where they don't matter, rather than attempting to sink them by adding mass (the brute force solution).

The deck is driven from an external quartz referenced power supply, finished in keeping with the turntable. This drives each phase of the motor using its own Class A amplifiers, and runs hot as a result. Uniquely, the centre spindle is detachable to ensure records only contact the mat, not the main bearing directly.

The Roksan is physically large and its aesthetics are plain, but the finish is Al, especially the now diamond turned metalwork. Only the lid is rather flakey; it would benefit from rubber stops and counterspringing to replace the friction hinges. Setting up, simple in principle, is fiddly in practice and best left to the dealer (and his stethoscope!).

## LAB REPORT

Wow and flutter is excellent, the Roksan achieving significantly lower wow than a number of the super-decks with ultra-heavy platters. The *Xerxes* also responded as well as almost any of the impulse and acoustic feedback tests, with a notably smooth energy trend, but some increased 'noise' at the lowest frequencies and to a lesser extent near 500Hz too. The former demonstrates the need for a good, firm isolating platform. Platter damping is relatively poor but resistive, in line with expectations for a non-clamped felt covered platter, and the initial transient was quickly damped in the impulse test. Rumble levels were excellent and the spectrum clean.

## SOUND QUALITY

Sound quality is top class. To start with, the basics are right: the deck runs at the right speed, with no audible dynamic wow, superb pitch resolution, speed and bass integration, and operates with a range of arms. When a note stops, *Xerxes* stops too – it has less overhang than almost any upmarket turntable. Aside from these prerequisites, stereo resolution is particularly fine, with stable soundstaging and explicit depth information in a suitable system. The sense of control is apparent at all volume levels, but never impedes the liveliness of the music. Early samples seemed to compress the dynamic range somewhat, but this criticism no longer applies with the latest production.

*Xerxes* works well with a range of arms, including the Mission *Mechanic*, but can sound a little lightweight in some situations. However, the Linn *Iitok* is less happily accommodated than on the *LP12*. Conversely the Rega *RB300*, which doesn't sound too happy on a Linn, could have been made for *Xerxes*.

## CONCLUSIONS

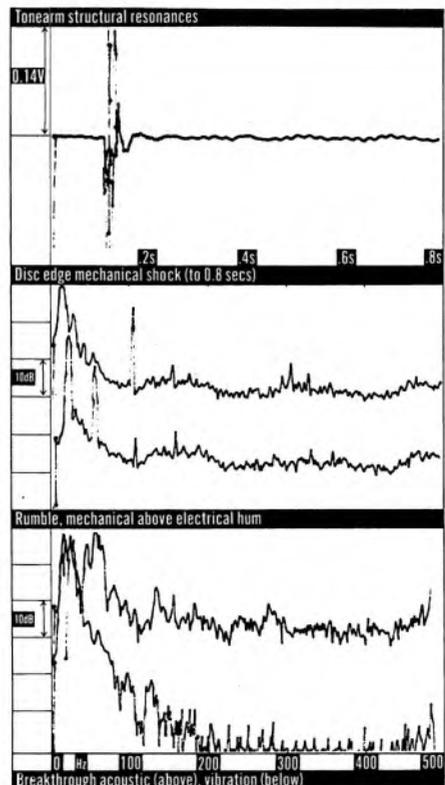
One version of the state of the art, and an unequivocal Recommendation. Great value with the Rega *RB300* too, but be careful about siting.

## TEST RESULTS

### Motor section

Type	manual motor unit
Platter mass/damping	2.1kg/good
Finish and engineering	excellent
Type of mains connection, leads	3-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.07%/0.12%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.13%/0.02%
Absolute speed error	+0.13%
Speed drift 1 hour/load variation	-0.06%/-0.03%
Start up time to audible stabilisation	5 sec
Rumble DIN B Wtd L/R/L+R	-78dB/-80dB
Size (h x w x d)/clearance for lid rear	15 x 48 x 39cm/7cm
Ease of use	average
Typical acoustic breakthrough and resonances	excellent
Subjective sound quality of complete system	excellent
Hum level/acoustic feedback	excellent/excellent
Vibration sensitivity/shock resistance	good/good
Estimated typical purchase price	£665

Reprinted from issue No 55







# SANSUI SR-222 MK V

SANSUI ELECTRONICS UK LTD., AXIS 4, RHODES WAY, WATFORD, HERTS. WD2 4YW. TEL: (0923) 226499.



Now in *Mk V* form, this Sansui is one of precious few serious low to mid price turntables still produced by a Japanese hi-fi industry that has switched wholesale to digital audio.

It isn't the lightweight it once was. The current £159 *SR-222* has a heavy 8.3kg plinth made from layers of particle board. The platter is a high inertia item with access holes for belt threading, formed in one piece with a concealed inner rim for the belt drive. The drive system uses a DC motor with electronic speed change servo control system; in contrast to UK practice this is a high speed, small pulley design. The plinth sits on springy feet, in lieu of a suspension.

Unusually in an integrated player, the arm is height adjustable. Elsewhere it has a fixed headshell and a straight arm tube with an internal brass tube strengthening the structure over part of its length. Aluminium is used for the headshell and (presumably) the arm tube, and the arm base is a zinc alloy.

What hasn't changed over the years is the finish – a superb piano black gloss, with a lid that looks as though it's fabricated rather than moulded, plus a superbly detailed arm. No cartridge is supplied and operation is manual.

## LAB REPORT

The measurement programme showed that the classic concerns of turntable designers, primarily wow and flutter and rumble, have been well optimised. On the whole, however, the subtler aspects of structural control are less well handled. As an example, the excellent looking arm turns out to have only modestly low lateral friction (vertical friction is good) yet perceptible bearing slack; had the bearings been tight, a little friction would have been more understandable. Additionally, bias force varies wildly across the record surface. Bearing geometry is also wrong, causing the cartridge to tilt slightly (as viewed from the front), when riding

warps. Finally, effective arm mass is extremely high, suggesting that only very low compliance (and preferably low mass) cartridges will be ideally suited.

The platter takes some time to settle down after being excited; it appears to ring in a fairly complex way, the spectrum analysis showing a sharp energy peak near 250Hz.

Breakthrough via the chassis is only moderately well suppressed, the lack of suspension telling here. But the plinth itself appears to behave quite well, and motor breakthrough is low.

## SOUND QUALITY

The Sansui impressed as a competent performer. It works well with good moving magnets and budget 'coils – the test Audio Technica *AT-F5* is a little over the top here – and has a lively, energetic quality with a firm, precise and tuneful bass. This bass is rather different to the kind you may be used to from many UK specialist designs, but is no less effective or valid.

The arm dominates matters higher up, however, and is probably responsible for what turns out to be a rather cluttered, edgy sound when reproducing particularly hot recordings. There were obvious losses of detail at such time too (I'm thinking here of some powerful choral passages from the Abbado/DGG recording of Prokofiev's *Alexander Nevsky*), and tracking margins are slightly impaired with known cartridges, though high arm inertia may have been partly to blame.

## CONCLUSIONS

The Sansui *SR-222 Mk V* isn't quite as good as it looks, but on the other hand it's not as expensive as it looks either. It is sharp and clear, offers good pitch stability, and has the kind of aesthetics that turns heads. Not bad – not bad at all.

## TEST RESULTS

### Motor section

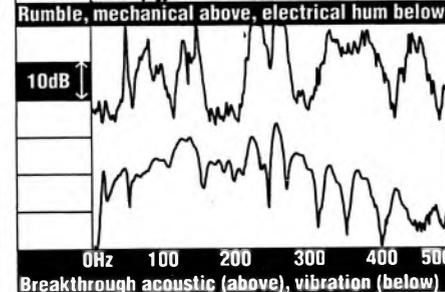
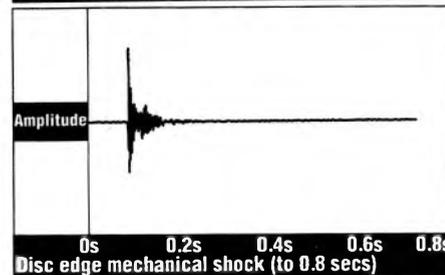
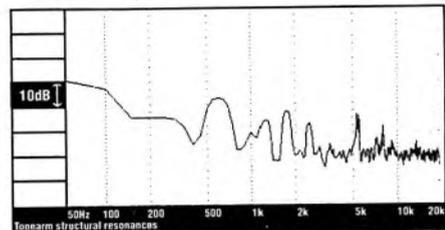
Type	manual belt-drive integrated player
Platter mass/damping	1.5kg/poor
Finish and engineering	excellent/average
Type of mains connection leads	captive 2-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.076%/0.13%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.13%/0.06%
Absolute speed error	+0.09%
Speed drift 1 hour/load variation	0.3%
Start up time to audible stabilisation	2 sec
Rumble DIN B Wtd L/R/L + R	-78dB/-82dB/-82dB

### Arm section

Approx effective mass inc screws, excl cartridge	16g
Type/mass headshell	semi fixed/n/a
Geometric accuracy	very good
Adjustments provided	height, overhang, lateral
Finish and engineering	very good
Ease of assembly/set-up/use	excellent/very good/good
Friction (typical) lateral/vertical	25mg/10mg
Bias compensation method	calibrated dial
Bias force, rim/centre (set to 1.5g elliptical)	80mg/180mg
Downforce calibration error 1g/2g	0.05g/0.10g
Cue drift	negligible
Cue rate ascent/descent	instant/3 sec
Arm resonances	poor
Arm damping method	none

### System as a whole

Size (h x w x d)/clearance for lid rear	16 x 43 x 39cm/8cm
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	average
Hum level/acoustic feedback	good/average
Vibration sensitivity/shock resistance	poor
Estimated typical purchase price	£159



# SOURCE SO

SOURCE/ODYSSEY LTD., 157 CURLE ST., GLASGOW G14 0TS. TEL: (041) 954 5585.

RECOMMENDED



The *So* – a cheaper derivative of and replacement for the original *Source* – represents the first important design input since the change of ownership. The company used to be associated with Jack Lawson of The Music Room fame, but is now independent of dealer involvement. The changes to the product are intended to be evolutionary rather than revolutionary, but have the very useful side effect of reducing the selling price by £170 to £675.

The major points of departures from the old *Source* are as follows. The motor is a new DC unit from Papst, with a completely new outboard power supply fitted in a smaller, neater case, partly facilitated by a change to toroidal transformers. It supplies two sine-wave outputs in quadrature, driving the motor as though it was an AC type. Mild wow problems with the earlier model have been tackled by using a less compliant belt and improved, more stable Cermet trimmers.

The platter has been completely redesigned and is lighter than before. The inner machined (not cast) aluminium hub has been enlarged, and the outer, which concentrates a great deal of weight around the periphery, is made from phosphor bronze. This juxtaposition of non-similar materials promises good mutual damping properties.

Certain features are unchanged. They include the magnificent sculpted solid wood plinth (mahogany or oak) and 5-spring suspension (the extra springs tackle out of balance forces), though the subchassis and leatherette covered top plate are now made of MDF instead of steel. There's even an enigmatic reference in the literature to a choice of lid height for those who require it. This will be welcome news to those who had difficulty squeezing any kind of lid out of *Source* – under the old management, I hasten to add. The player sits on cones, and on/off and speed change are selected using a switch at stage front.

## LAB REPORT

As promised, the wow problem pinpointed in the last turntable issue has been cured, the current 0.13 per cent figure being excellent by any standards. Source also supplied some belts of different compliances – one harder and the other softer than the 'standard' one; both gave significantly inferior measurements. Flutter is low anyway, flattened by the steamroller-like inertia of the system. However, slowing under load is a little high, as is rumble, though the bearing was brand new and there was no opportunity to run it in prior to measuring, as was done with most other decks, and there were signs of improvement later into the listening.

The other tests gave satisfactory results or better. The most notable feature is the well damped platter, though this does show a sharp null at 290Hz, which is close to a resonant spike that appears on virtually all the plots.

## SOUND QUALITY

The *So* is a much improved turntable over its previous incarnation. In our last test, the *Source* was described as 'rich, powerful but... slow' sounding, as well as suffering audible (as well as measured) wow. The bass used to be slightly bloated – I'm told the steel panels used to ring – but these things have been cured in this new deck, which is much closer to what a top end turntable should be about.

With a good arm – and designs as disparate as the SME *Series IV* and Alphason *HR-100S* suit well – the *Source* now sounds lean and powerful. There are no traces of speed problems of any kind, and the deck's mid-band imagery and timing are first class. The suspension system is refined and effective.

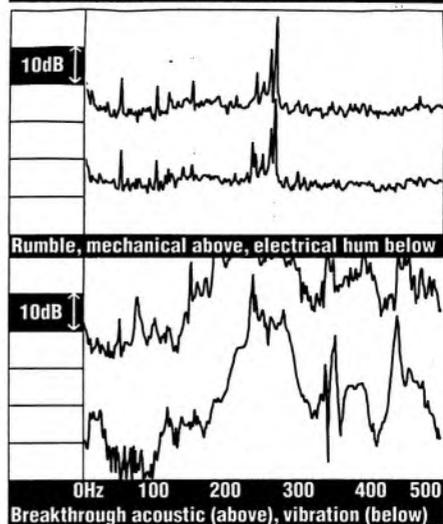
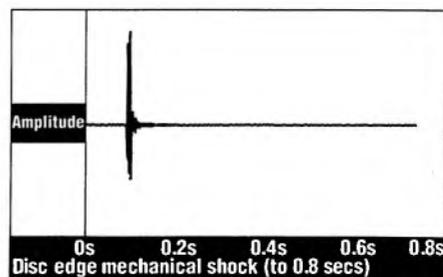
## CONCLUSIONS

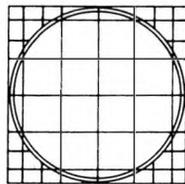
I'd like to see still better LF separation and

the deck lacks the turn-on-a-sixpence agility of the very best, but the structural solidity in the bass and midband is almost unrivalled. The speed problems are now well and truly behind it, and the *So* is at last a *Source* that can be safely Recommended.

## TEST RESULTS

Type	manual belt-drive motor unit
Platter mass/damping	5.2g
Finish and engineering	excellent
Type of mains connection leads	3-core, captive (via PSU)
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.07%/0.13%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.13%/0.048%
Absolute speed error	-0.67%
Speed drift 1 hour/load variation	0.82%
Start up time to audible stabilisation	5 sec
Rumble DIN B Wtd L/R/L + R	-66dB/-67dB/-68dB
Size (h x w x d)/clearance for lid rear	16.5 x 50 x 40cm/7cm
Ease of use	good
Typical acoustic breakthrough and resonances	fair
Subjective sound quality of complete system	good
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	average
Estimated typical purchase price	£675





**SOURCE-ODYSSEY LTD.**  
157 CURLE STREET, GLASGOW G14 0TS, SCOTLAND, U.K.  
Telephone: 041-954 5585. Telex: 776563 Fax: 041-954-5586

## **THE S.O.**

Developed to reproduce the best possible sound from the best medium to-date.

The S.O. manufactured to the highest possible standards and from the finest materials available.

Each Deck is hand built with pride so that you can enjoy its use well in to the next century.

The S.O. is a two speed electronically switched suspended sub chassis turntable designed with extensive outboard power supply, offering outstanding value for money at –  
**£675.00** Including V.A.T.

Ask your Dealer for a demonstration, or contact us direct at above address.

# TOP 50

## FROM STEVE BOXSHALL AUDIO

Dual, Denon, Rotel, Creek, QED, Yamaha, KEF, Wharfedale, Monitor Audio, Target, Mordaunt-Short, Systemdek, Sennheiser, Cambridge Audio, Celestion, JPW, Mantra, Audio Technica, Tannoy, Sumo, Gale, Quad, Rogers, Nakamichi, Roksan, Meridian, Helius, Marantz, Audiolab, Musical Fidelity, Ruark, Lynx, Beard, Inca Tech, Acoustic Energy, Gyrodek, Orell, Revox, Source, VDH, Oxford Acoustics, Stax, SME, Clear Audio, Oracle, Sonus Faber, P.S. Audio, Air Tangent, Koetsu, Magneplanar, Krell, Audio Research

**SONY**

**HI-FI  
NEWS  
&  
RECORDS  
REVIEWS**

*Dealer Awards  
1987*

REGIONAL  
WINNER

*Steve  
Boxshall*  
**AUDIO**

A MEMBER OF BADA

**41 VICTORIA ROAD, CAMBRIDGE (0223) 68305**

# SYSTEMDEK IIX

SYSTEMDEK LTD., UNIT 34, KYLE ROAD, IRVINE INDUSTRIAL ESTATE, IRVINE, SCOTLAND. TEL: (0294) 71251.

RECOMMENDED



The £170 *IIX* is the least costly version of Systemdek's mainstream middle market model, (the £250 *IIXE* is reviewed separately). We've teamed it with Dunlop's own arm, which makes an attractive and affordable package. When purchased this way, the deck arrives set up and ready to run for £248 all in.

What is it all about? The *IIX* is a 3-point suspended player using familiar ingredients: three similar and more or less undamped springs used in extension rather than compression, a strong but not too heavy alloy subchassis, a Medite armboard (interchangeable for all popular arm types), a Medite subplatter which provides the drive surface and a Rega-like 10mm thick glass platter with thin lambswool felt mat. The hollow plinth is a traditional looking wood veneered item of good appearance and finish. The lid, complete with friction hinges, is very well built, but best removed for heavy earbaling.

The drive system is equally classic in principle. A slow speed 24-pole mains driven synchronous motor is clamped to the chassis in a cage like arrangement described as an anti-vibration assembly. Drive is transferred by flat belt from a split diameter pulley. Speed change is manual. The main bearing consists of a stainless steel spindle running in an unsleeved solid bronze sleeve – an uncompromising piece of engineering but evidently rather noisy until properly run in.

The arm is a standard looking off-the-shelf Japanese OEM design, probably from Jelco, with straight armtube and well made bolt-on headshell. The bearings are correctly offset to maintain cartridge azimuth over warps. The cueing mechanism works well and the arm is easy to set up and to use.

## LAB REPORT

The suspension is set to around 5Hz (estimated) and effectively decouples the deck

from all but the lowest frequency components of impinging waveforms. There is some breakthrough, but it's well spread out with no dominant effects. There is some platter ringing too, but it's quickly damped. Motor breakthrough and rumble artefacts are well suppressed. Wow and flutter are pretty good, though not exceptionally so, and rumble levels (as opposed to the rumble spectrum) are exceptionally low once run in.

The arm is less than brilliant from a structural viewpoint. The armtube has a significant first breakup mode around 850-900Hz, and a series of poorly damped modes spaced along the band like telegraph poles. Effective mass is moderate, and although there is some friction, it isn't high and bearing slack is negligible. The bias mechanism is well engineered and the arm accurately calibrated.

## SOUND QUALITY

The arm is an acceptable enough design, though it falls a little short of the best budget Japanese arms and well short of Rega standards, for example. But it's incisive and poised enough and it certainly won't offend.

The player itself is lucid and articulate. Presentation is distinctly forward, creating a tangible if rather pushy soundstage as a result. Very energetic passages tend to sound rather cluttered – almost 'glassy' in fact – but the bottom line finding is that the Systemdek *IIX* is detailed, spacious and articulate. The bass end may be lean in balance but it's extremely well controlled.

## CONCLUSIONS

As well as being amongst the cheapest decks with a fully effective suspension, the *IIX* has an air of rightness and fitness for purpose. It behaves just like what it is – a cut price version of an expensive turntable. The arm is adequate if not exceptional, and the package overall is clearly Recommended.

## TEST RESULTS

### Motor section

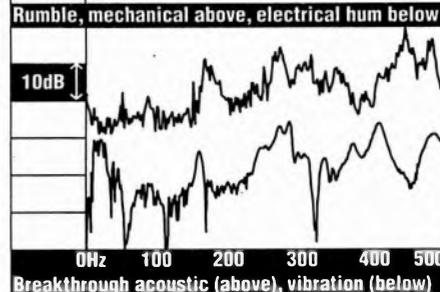
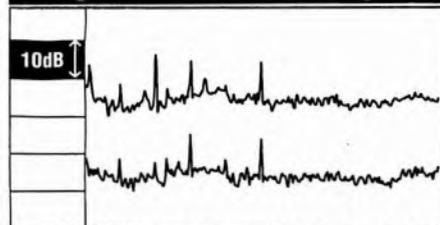
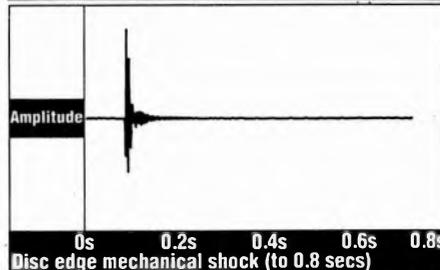
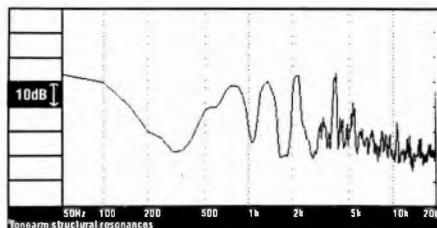
Type	manual motor and arm
Platter mass/damping	1.73kg
Finish and engineering	good
Type of mains connection leads	captive 3-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.17%/0.19%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.19%/0.09%
Absolute speed error	+0.3%
Speed drift 1 hour/load variation	synchronous/0.03%
Start up time to audible stabilisation	3 sec
Rumble DIN B Wtd L/R/L + R	-80dB/-83dB/-85dB

### Arm section

Approx effective mass inc screws, excl cartridge	11g
Type/mass headshell	semi fixed/n/a
Geometric accuracy	good
Adjustments provided	lateral/overhang/tilt
Finish and engineering	good
Ease of assembly/set-up/use	good/good/average
Friction (typical) lateral/vertical	20mg/25mg
Bias compensation method	dial
Bias force, rim/centre (set to 1.5g elliptical)	150mg/160mg
Downforce/calibration error 1g/2g	0/0.05g
Cue drift	slight
Cue rate ascent/descent	instant/2 sec
Arm resonances	poor
Arm damping method	none

### System as a whole

Size (h x w x d)/clearance for lid rear	14 x 47 x 36cm/6cm
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	average
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	good
Estimated typical purchase price	£170 (£248 inc. arm)



# SYSTEMDEK IIX ELECTRONIC

SYSTEMDEK LTD., UNIT 34, KYLE ROAD, IRVINE INDUSTRIAL ESTATE, IRVINE, SCOTLAND. TEL: (0294) 71251.



The middle model in Dunlop's *Systemdek* turntable range is this *IIX Electronic*, or *IIXE* for short, which sells for £248 alone, or £326 with arm fitted.

The *I* series generally and the *IIXE* specifically are designed to have traditional appeal. Carpentry takes the form of a wood veneered box, complete with horizontal feature strips; the top plate is inset a few millimetres below the level of the sides and the base is sealed in with a hardboard sheet. Cut-outs are provided for the platter bearing and armboard, which are coupled by an alloy girder subchassis. Suspended by three springs from the top plate, the subchassis can be levelled using neat socket headed adjusters accessible from above. Levelling – and arm lead dressing, for which a P-clip is provided – are the only suspension adjustments needed.

The drive system uses a mixture of familiar materials and techniques, including a 24-pole synchronous motor which drives a Medite subplatter through a flat belt. The platter is a Rega-esque glass disc topped with a rather excellent thin felt mat. The platter interfaces with the spindle via a precision hard plastic insert. The suspension is tuned to a low frequency (circa 4Hz) and is essentially undamped.

Where the *Electronic* version departs from the *IIX* is in its use of an outboard power supply, a small box which houses a synthesised twin-phase circuit and has a front panel switch for speed change.

This *Systemdek* embodies some excellent engineering, and is well built and presented. It's also a safe choice in the sense that it is very easy to set up (it comes preadjusted for 'average' weight arms) and use. The only long term problem I can foresee is possible sagging of the base panel which could be avoided (or rectified) by using extra screws.

## LAB REPORT

This deck was measured and assessed with

the *Systemdek* arm, used also to test the *IIX*. The *IIXE* behaves roughly on a par with that model in most respects, but there is one notable difference. The *Electronic* version has higher low rate speed inaccuracies than the mains driven one; it also slows more under load (though not seriously so) and takes one second longer to reach running speed. All of which suggest that torque of the *Electronic* supply version might be increased to advantage.

A small amount of electrical breakthrough was found, but the main bearing is excellent and rumble is low. Acoustic coupling via the suspension is well suppressed, and the platter is quite well damped even though some ringing is present at almost exactly 300Hz.

## SOUND QUALITY

The outboard electronics make the deck much more convenient to use for those into 45s, since there's no need to remove the platter and move the belt. But this convenience is achieved at the expense of added wow: is the considerable extra cost justifiable on other grounds?

The answer is yes. The *IIX* is an excellent turntable for the price, but it can sound a little cluttered and 'glassy' when the music gets busy. The *IIXE* still leans perceptibly in the same direction – it doesn't have the easy, relaxed presentation that is the hallmark of the best in analogue record playing hardware. But stridency is much reduced, and reproduction is more homogeneous and consistent as a result.

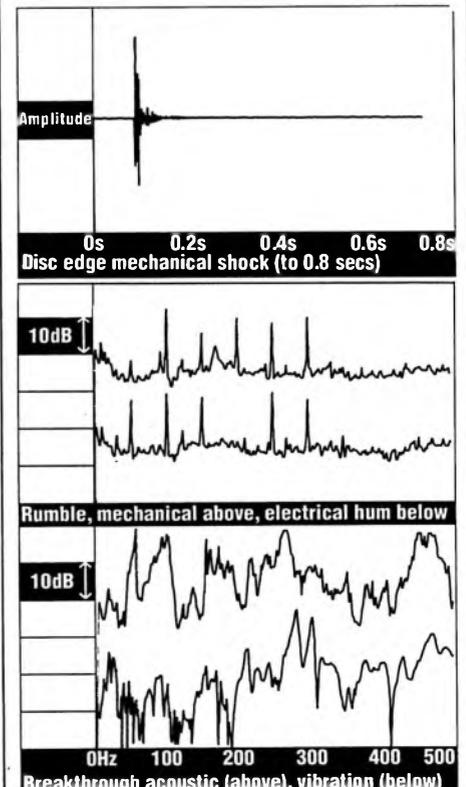
## CONCLUSIONS

This is one of the better middle price turntables. It has a simple and effective suspension and gives every indication that it will behave consistently in the long run. The price penalty over the *IIX* is manifestly well spent, even though motor dynamics are not ideal. Recommended.

## TEST RESULTS

### Motor unit

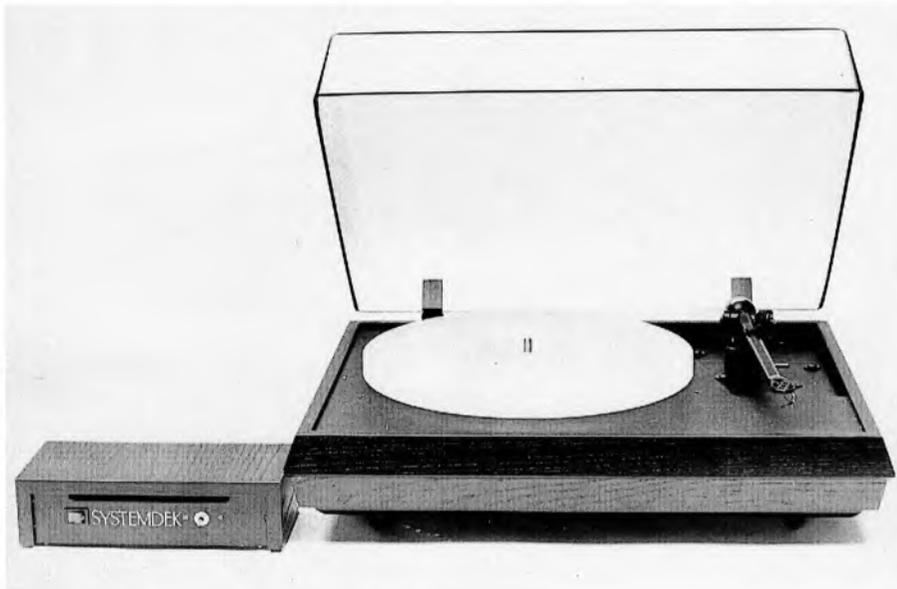
Type	manual motor unit, external PSU (optional arm)
Platter mass/damping	1.75kg/average
Finish and engineering	good
Type of mains connection leads	captive 3-core from PSU
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.17%/0.30%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.32%/0.074%
Absolute speed error	+0.32%
Speed drift 1 hour/load variation	none/0.25%
Start up time to audible stabilisation	3.5 sec
Rumble DIN B Wtd L/R/L+R	-79.5dB/-83dB/-84dB
Size (h x w x d)/clearance for lid rear	14 x 47 x 36cm/6cm
Ease of use	good
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	above average
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	good
Estimated typical purchase price	£248 (£326 inc. arm, see <i>IIX</i> review)



# SYSTEMDEK IV ELECTRONIC

SYSTEMDEK LTD., UNIT 34, KYLE ROAD, IRVINE INDUSTRIAL ESTATE, IRVINE, SCOTLAND. TEL: (0294) 71251.

RECOMMENDED



The *Systemdek IV* is an engine for driving high grade arms and cartridges, but is built on much the same principles as the more familiar, less costly *IIX* and *IIXE*, though very few components are shared. From examination, the sleeveless bronze and steel main bearing and the drive system are the obvious exceptions, but these seem well up to their tasks. At one time, Dunlop engraved a spiral shape around the outside of the bearing spindle to act as an oil pump, but this has been dropped.

The suspension system is based on an elaborate subchassis hanging from the wood top plate by three coil springs. The arrangement is inherently stable – it assumes a natural balance when levelled – and has a very low and apparently undamped natural resonance (though in reality the springs are foam cored). Spring tension is adjustable from above.

The platter is a two piece affair consisting of a very well made alloy drive hub/subplatter on which rests a very slightly dished acrylic platter with label recess. In this feature, and also in the basic suspension topology, the *Systemdek IV* quite closely resembles the Pink Triangle. The drive system uses an out-board synthesised supply with electronic speed change driving Systemdek's usual motor, which in this model is encased within a full screening cage.

I admit to being not a fan of black ash, but there's nothing wrong with the quality of the neatly sculpted plinth, which is enclosed in from below by a reinforced wood panel. The lid is a fine quality component too. The only jarring elements are the crude bolt arrangement that secures the arm base to the subchassis and the lack of adequate on/off switch suppression.

## LAB REPORT

The deck was supplied with a Rega armboard, and was tested with a Rega *RB250*

(for the measurements) and a *RB300* (for listening). Like the other electronic drive *Systemdek* (the *IIXE*), the *IV*'s only obvious weakness is higher than expected wow, but audible flutter is absent, and I detected no obvious signs of wow in normal use that couldn't have been explained away as out of centre records, for example. Still, this matter deserves further attention.

The main bearing is good and rumble is low. Electronic breakthrough is extremely well controlled, and even hum sensitive cartridges like an old Grado I had available were happy. Acoustic breakthrough via the suspension was higher than ideal above 150Hz or so, but this is partly due to the lack of clamping – the record sits straight on the bare platter – and a simple puck like device (the *Revolver Pig* for example) is a good idea, both on paper and in practice. The platter itself is extremely well behaved, with one mild resonant feature near 400Hz, but no sustained ringing following excitation.

## SOUND QUALITY

The *IV* works; compared to the cheaper *Systemdek* models this one has a wider effective bandwidth, especially at low frequencies. Individual instruments are better separated and tonal colours are more distinctive and richer hued.

There's another factor here too. For some peculiar reason, the glass platter models impose what amounts to a slight 'glassiness' on the music; the *IV*'s vinyl-like platter is sweeter, more relaxed and in stereo terms more spacious. Happily all this is achieved without loss of clarity. Just the opposite in fact. Add these qualities together and you have a deck that is only a rung or so below the top stratum of turntables, and one that most of us will take a long time to outgrow.

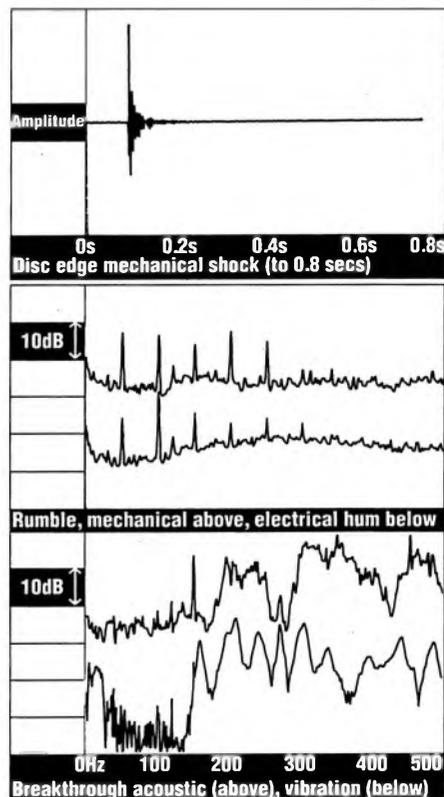
## CONCLUSIONS

The *Systemdek IV* is Recommended for its all

round competence and mainstream appeal. It will make an excellent heart for some quite ambitious systems, and clearly betters the cheaper *Systemdek* models on information retrieval and euphony alike.

## TEST RESULTS

Motor unit	
Type	manual belt drive motor unit (optional arm)
Platter mass/damping	4kg
Finish and engineering	good
Type of mains connection leads	captive 3-core from PSU
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.27%/0.34%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.44%/0.074%
Absolute speed error	+0.44%
Speed drift 1 hour/load variation	+0.03%/–0.31%
Start up time to audible stabilisation	4 sec
Rumble DIN B Wtd L/R/L+R	–79dB/–83dB/–81.5dB
Size (h x w x d)/clearance for lid rear	18 x 50 x 40cm/7.5cm
Ease of use	good
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	very good
Hum level/acoustic feedback	very good/average
Vibration sensitivity/shock resistance	good/average
Estimated typical purchase price	£495 (£570 inc. Systemdek arm)



# AMPLIFICATION by SYSTEMS



ION SYSTEMS LTD, 61 Mochdre Business Park, Newtown, Powys, SY16 4LE. Tel (0686) 25266 Fax (0686) 25241

## VICTORIA AUDIO

3 Warwick Way  
Victoria  
London SW1

Tel: 01-630 9444



**MAIL ORDER  
FREE CARRIAGE  
Anywhere in the U.K.**

<b>ARISTON</b>	<b>AUDITION</b>
Q DECK.....£139.00	THE NEW
ICOM.....£210.00	'AVALON' TURNTABLE

**OAKLEY  
IMAGE  
PRE-AMP**



101.....	£139
205.....	£199
301.....	£269
401.....	£399
AMS Black.....	£469
AMS White.....	£489
RM1.....	£179

STOCKIST OF:

ALPHASON, AUDIO TECHNICA, A&R CAMBRIDGE, ARISTON, BOSE, B&W, BEYER, CASTLE, DYNAVECTOR, ELITE, FOUNDATION, HARMAN, KARDON, JBL, KUZMA, MANTICORE MANTRA, NAKAMICHI, ONKYO, QED, TARGET, TOWNSHEND, VAN DEN HUL

★ SINGLE SPEAKER DEM ROOM ★

## WEST MIDLANDS AUDIO

HI-FI CONSULTANTS



LINN, REGA, NAIM, ROKSAN, CREEK, ROTEL, A & R, MORDAUNT SHORT, DENON, EPOS, ACOUSTIC ENERGY, HEYBROOK, GALE, INCATECH, MISSION, TDL, ION SYSTEMS, YAMAHA, ETC . . .

158 Ombersley Rd., Worcester, WR3 7HA  
OPEN 9.30 am to 8.30 pm

**Tel: WORCESTER (0905) 58046**

# THORENS TD280

PORTFOLIO MARKETING LTD., HILLBOTTOM RD., SANDS IND. EST., HIGH WYCOMBE, BUCKS HP12 4HT. TEL: (0494) 463345.

BEST BUY



You've heard it said about a certain beer; here we have a Thorens that goes where no Thorens has previously gone. The *TD280* is an integrated semi-automatic record player from this famous stable which sells at a surprisingly keen £149.90.

Low price notwithstanding, the platter is a two piece design – a plastic inner hub and a relatively massive alloy main casting; three keyhole slots break up the top surface and appear to serve no useful function – Thorens please note. The record sits directly on the usual rubber mat, which has a ribbed bottom.

Drive is provided by flat belt from a low voltage 24-pole synchronous motor which in turn is fed from a servo circuit with speed change electronics. The motor is bolted straight to the chassis which acts as a mass damper. The player has no internal suspension; compliant feet provide a degree of environmental isolation.

The arm is a recent design called the *TF28ES*, but it's an integrated part of the package despite the separate model number. This conventional design has a straight armtube and offset fixed headshell. It's unusual only in lacking the quirks of older Thorens' arm designs; established Thorens' customers will know what I mean.

The control system is elegant simplicity. All controls are ranged along the front top surface: cueing, speed selection (and 'off') and a start key are all self explanatory. At end of side, the electronics detect the increases in lateral arm speed as the stylus traverses the end scroll, triggering the arm lift and cutting the motor. The system is totally friction free and should never need adjustment as it senses velocity rather than position. The deck is finished in a textured black vinyl of reasonable quality, and the lid is well made with effective friction hinges.

## LAB REPORT

The lab test results are, on the whole, clean.

The deck has an excellent low noise main bearing and an effectively damped platter with smooth energy transmission – ie it doesn't strongly favour particular frequencies. The main carcass is a little more frequency selective, with significant energy transmission around 230Hz and again an octave higher. Motor breakthrough is also significant and can just be heard, but only under unrepresentative (if not completely unrealistic) conditions. There is some (0.27%) linear wow, but little slowing under load, and the deck runs very close to the nominal speed.

The arm is structurally modest, with breakup modes extending without uninteruption from around 500Hz, including some nasty looking spikes deep in the treble. Arm mass is on the heavy side of average at 13g, but bearing friction levels are quite low and also free of detectable slack.

## SOUND QUALITY

The audible result of the chassis structural effects described above can be heard quite clearly as a lower midband coloration, with a consequent loss of dynamics in this region.

The Thorens is unquestionably not as fast on its feet as some, yet the bass has excellent reach and poise, and the system is fairly clean and consistent in its primary attributes – dynamics, coloration and soundstaging especially, and at higher frequencies too. The arm is best suited to low-to-medium compliance moving magnet cartridges, working well with an Audio Technica *AT-95E*.

## CONCLUSIONS

To an even greater extent than usual, the *TD280* is an astonishing amount of hardware for the money. It's also well made and is backed by one of the best and most professional names in the business. It would be gross negligence not to award it Best Buy status.

## TEST RESULTS

### Motor section

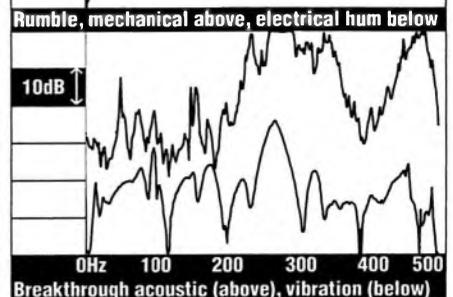
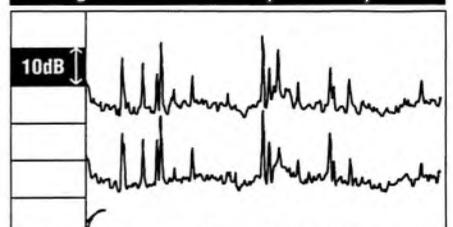
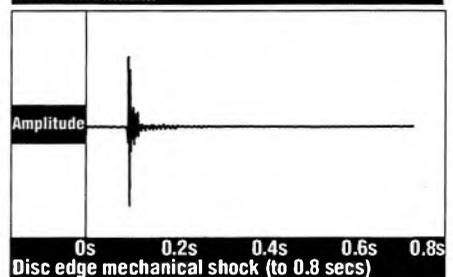
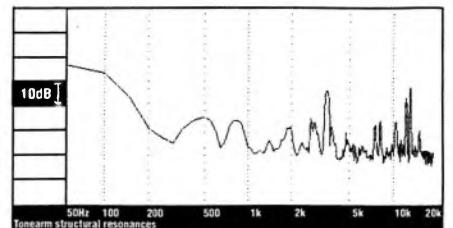
Type	semi-auto belt drive integrated player
Platter mass/damping	1.3kg/good
Finish and engineering	adequate/good
Type of mains connection leads	detachable (transformer plug)
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.15%/0.24%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.27%/0.05%
Absolute speed error	+0.28%
Speed drift 1 hour/load variation	none/-0.4%
Start up time to audible stabilisation	4 sec
Rumble DIN B Wtd L/R/L+R	-78dB/-82dB/-84dB

### Arm section

Approx effective mass inc screws, excl cartridge	13g
Type/mass headshell	semi-fixed/n/a
Geometric accuracy	very good
Adjustments provided	overhang/lateral
Ease of assembly/set-up/use	good
Friction (typical) lateral/vertical	20mg/<10mg
Bias compensation method	dial
Bias force, rim/centre (set to 1.5g elliptical)	200mg/180mg
Downforce calibration error 1g/2g	0/-0.4g
Cue drift	moderate
Cue rate ascent/descent	<1 sec/3 sec
Arm resonances	good
Arm damping method	none

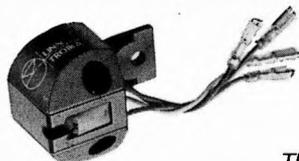
### System as a whole

Size (h x w x d)/clearance for lid rear	13.5 x 44 x 36cm/8cm
Typical acoustic breakthrough and resonances	below average/good
Subjective sound quality of complete system	average to good
Hum level/acoustic feedback	below average
Vibration sensitivity/shock resistance	average
Estimated typical purchase price	£149.90



# ★ LISTEN HERE ★

- ★ PERFORMANCE
- ★ PRICE
- ★ PLEASURE



*The 3 Point Solution*

USE OUR EXPERTISE  
TO SELECT THE BEST SOUND  
FROM OUR EXTENSIVE RANGE

**HAVE YOU HEARD:-?**

*Rega Planar 3 + Elys  
Creek CAS4040/2  
Ruark Swordsman*  
**£610.00**

*(A slice of the best)*

*Linn Sondek LP12 + Ittok + Troika*

*Naim 32-5, Hi-Cap, NAP 140*

*NEW Naim IBL*

**£3585.00**

*(Hearing is believing)*

WE CAN ALSO DEMONSTRATE NAIM IBL or SBL  
'ACTIVE' SYSTEMS'

*Phone for details*

*Linn Axis + K9  
Inca Tech Claymore  
Ruark Sabre*

**£1062.00**

*(A clear cut winner)*



*All Loudspeaker cables supplied (up to 10 metres)*

- LINN
- ROKSAN
- REGA
- CREEK
- I.T.L.
- NAIM
- EXPOSURE
- QUAD
- INCA TECH
- ONIX
- A&R
- EPOS
- RUARK
- KEF

## NOW PERFORMING THE NEW

LINN EKOS Tonearm on the .....£895

(In)famous LINN SONDEK LP12 with .....£539 black

The NEW LINN K18 Cartridge .....£140

Amplified by the latest LK1/LK280 combination. £459/£595

and Beautiful Sounds emitting from the unbelievable

NEW Loudspeakers – The LINN HELIX .....£259  
(Stands £69)

**£2950**  
including  
cables

WE WERE TRULY STUNNED INTO SILENCE

ALL PRICES INCLUDE VAT

- MONITOR AUDIO
- ROYD
- DENON
- YAMAHA
- NAKAMICHI
- TARGET AUDIO
- ORIGIN LIVE

FREE DELIVERY

2 YEARS WARRANTY

AT

## Photocraft Hi-Fi



AUDIO DEMONSTRATION  
FACILITIES

40 HIGH STREET,  
ASHFORD,  
KENT,  
TEL: (0233) 624441/2



# THORENS TD166 Mk II

PORTFOLIO MARKETING LTD., HILLBOTTOM RD., SANDS IND. EST., HIGH WYCOMBE, BUCKS HP12 4HT. TEL: (0494) 463345.

BEST BUY



Continuing unmodified for its umpteenth season (with a break straddling the change in distribution a few years back), the *TD166* is reassessed afresh for this issue. It's no longer the budget model in the Thorens range, being undercut by the 30 per cent cheaper *TD280*, but the '166 is the cheapest of the classic *TD150/160* derivatives, offering the minimum necessary compromises within the strict cost constraints. The arm, for example, has a fixed headshell, and the player eschews automation of any kind.

For many people the *TD166* will be too familiar to need much description. For the rest, the player is built around a three-spring lightly damped floating subchassis of conventional design, a two piece platter consisting of a plastic inner driven hub, and a heavy diecast zinc alloy outer. The mat is flat on the top surface and ribbed on the rear (why?). The motor is a low voltage 16-pole unit, equipped like other Thorens players with a slipping clutch for trauma free start-up. Speed change is by switch which operates mechanically by guiding the belt from one pulley diameter to the other.

The arm is called the *TP21*. It has gimbal bearings, a straight arm tube and a conventionally offset headshell. The design has a neatness and lack of fuss that contrasts favourably with some of Thorens' earlier tonearm designs. The plinth is a well made wooden box with a steel top plate and black vinyl wrap side covering. The overall level of engineering is very high at the price. Cueing, which is controlled by a classic Thorens tear-drop control near the front, works smoothly, but the arm tends to drift sideways a little.

## LAB REPORT

Speed stability is good on the whole, though wow levels are not quite low enough to be completely negligible. Noise from the bearing is at a low level, but there are some discrete energy peaks, and motor breakthrough

is not entirely absent. Acoustic breakthrough and shock resistance rank as good, and the platter is extremely well behaved. It's effectively damped, and almost non-resonant.

The arm, however, is less than wonderful. The first point is that effective mass is high, appearances notwithstanding. Friction levels are also high at 75mg in both planes, though this at least was matched by a lack of bearing play. The bias mechanism is well designed, but counterweight calibrations underestimated tracking force by about 15 per cent – something of a Thorens speciality, oddly enough. Structurally, the Thorens was a mess of resonances, mostly severe, high Q ones, extending upwards from a few hundred Hertz.

## SOUND QUALITY

The *TD166* is one of a myriad of examples which confirm Thorens as unusually capable of producing a thoroughly professional and well engineered piece of kit, and placing it on sale at a price that few others could hope to come near.

It is also yet another example of the truism that Thorens is more at home designing turntables than they are tonearms. Despite all the flak the company has received over the years, all the efforts expended on arm design are still lacking when it comes to making music. Although it's not always easy to ascribe effect to cause with integrated players, some mid and high frequency roughness and loss of stereo focus and depth noted during the tests are certainly arm related. The player dominates elsewhere, however, with its deep, tuneful bass, its consistency with level and with its obvious range and stability.

## CONCLUSIONS

The arm still isn't wonderful, but the package as a whole continues to shine, and probably always will as long as Thorens can maintain present pricing. Best Buy.

## TEST RESULTS

### Motor section

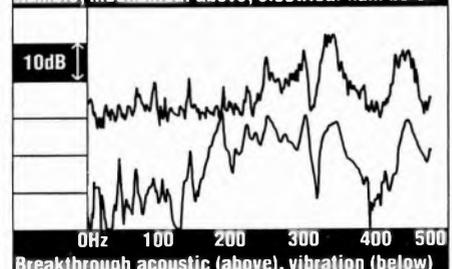
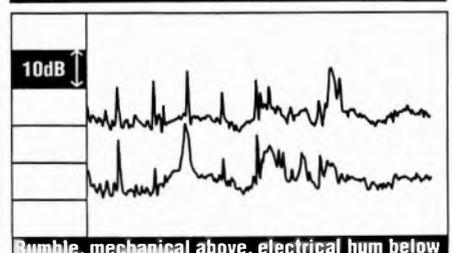
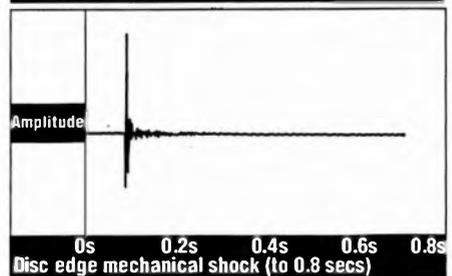
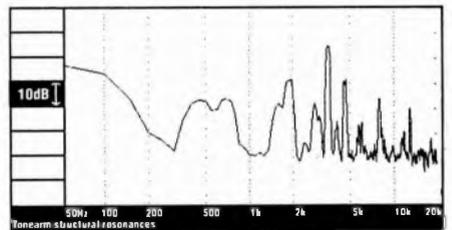
Type	manual integrated player
Platter mass/damping	2.7kg
Finish and engineering	average/good
Type of mains connection leads	detachable, transformer in lead
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.11%/0.22%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.24%/0.044%
Absolute speed error	-0.03%
Speed drift 1 hour/load variation	-0.12%/+0.79%
Start up time to audible stabilisation	3 sec
Rumble DIN B Wtd L/R/L + R	-78dB/-79dB/-83dB

### Arm section

Approx effective mass inc screws, excl cartridge	13g
Type/mass headshell	semi-fixed/n/a
Geometric accuracy	very good
Adjustments provided	overhang/lateral
Ease of assembly/set-up/use	good/average/good
Friction (typical) lateral/vertical	75mg/76mg
Bias compensation method	thread & weight
Bias force, rim/centre (set to 1.5g elliptical)	150mg/120mg
Downforce calibration error 1g/2g	-0.15g/-0.3g
Cue drift	moderate
Cue rate ascent/descent	<1 sec/2 sec
Arm resonances	poor
Arm damping method	none

### System as a whole

Size (h x w x d)/clearance for lid rear	43 x 35 x 15cm/8.5cm
Typical acoustic breakthrough and resonances	good
Subjective sound quality of complete system	above average
Hum level/acoustic feedback	good
Vibration sensitivity/shock resistance	good
Estimated typical purchase price	£179.90



1. Louis Armstrong *West End Blues* 2. Johann Sebastian Bach *Brandenburg Concertos* 3. The Beatles *White Album* 4. Ludwig Van Beethoven *Symphony No 8 "Pathétique"* 5. Irving Berlin *Puttin' On The Ritz* 6. Chuck Berry *Sweet Little Sixteen* 7. Big Country *In A Big Country* 8. Georges Bizet *Carmen* 9. David Bowie *Space Oddity* 10. The Boys Of The Lough *Lochaber No More* 11. Benjamin Britten *Peter Grimes* 12. Big Bill Broonzy *Made A Date With An Angel* 13. Kate Bush *The Man With The Child In His Eyes* 14. Johnny Cash *A Boy Named Sue* 15. Tracy Chapman *Talkin' Bout A Revolution* 16. The Chieftains *Celtic Wedding* 17. Frederic Chopin *Piano Concerto No 1* 18. The Christians *Harvest For The World* 19. Nat King Cole *Mona Lisa* 20. Sam Cooke *Chain Gang* 21. Curiosity Killed The Cat *Ordinary Day* 22. Miles Davis *Bye Bye Blackbird* 23. Deacon Blue *Raintown* 24. Frederick Delius *A Song Of Summer* 25. Dire Straits *Brothers In Arms* 26. Bob Dylan *Highway 61 Revisited* 27. Antonin Dvorak *Symphony No 9 "From The New World"* 28. Edward Elgar *The Dream Of Gerontius*

29. Duke Ellington *Mood Indigo* 30. The Eurythmics *Who's That Girl?* 31. Everything But The Girl *Each And Every One* 32. Frankie Goes To Hollywood *Relax* 33. Ella Fitzgerald *Every Time We Say Goodbye* 34. Peter Gabriel *Sledgehammer* 35. George Gershwin *Porgy And Bess* 36. Gilbert and Sullivan *H.M.S. Pinafore* 37. Philip Glass *Satyagraha* 38. Benny Goodman *Let's Dance* 39.

King Sweet Sixteen 52. The Kinks *You Really Got Me* 53. Peggy Lee *Why Don't You Do It Right?* 54. Jerry Lee Lewis *Great Balls Of Fire* 55. Gustav Mahler *Symphony No 5* 56. Felix Mendelssohn *A Midsummer Night's Dream* 57. Glenn Miller *I've Got A Girl In Kalamazoo* 58. Charlie Mingus *Wednesday Night Prayer* 59. Thelonius Monk *Monk's Mood* 60. Morrissey *Every Day Is Like*

73. Django Reinhardt *Sweet Georgia Brown* 74. Little Richard *Good Golly Miss Molly* 75. The Rolling Stones *Brown Sugar* 76. Diana Ross *Mahogany* 77. Gioacchino Rossini *The Barber Of Seville* 78. Sade *Your Love Is King* 79. Franz Schubert *Death And The Maiden* 80. The Sex Pistols *Anarchy In The UK* 81. Dmitri Shostakovich *Symphony No 5* 82. Nina Simone *My Baby Just*

# 100 good reasons for coming to In Hi-fi.

*Cares For Me* 83. Simple Minds *Once Upon A Time* 84. Frank Sinatra *Nice 'n' Easy* 85. Bruce Springsteen *Born To Run* 86. Richard Strauss *Salome* 87. Igor Stravinsky *The Right Of Spring* 88. Talking Heads *Stop Making Sense* 89. Pyotr Ilyich Tchaikovsky *1812*

Merle Haggard *Okie From Muskogee* 40. George Frederic Handel *Messiah* 41. Coleman Hawkins *A Strange Fact* 42. Jimi Hendrix *All Along The Watchtower* 43. Billie Holiday *That Ole Devil Called Love* 44. Buddy Holly *Peggy Sue* 45. Gustav Holst *The Planets* 46. Michael Jackson *Thriller* 47. Elmore James *Dust My Blues* 48. Jean Michel Jarre *Oxygene* 49. Waylon Jennings *This Time* 50. Louis Jordan *Choo Choo Ch'Boogie* 51. B.B.

Sunday 61. Wolfgang Amadeus Mozart *Don Giovanni* 62. Carl Perkins *Blue Suede Shoes* 63. The Pet Shop Boys *Actually* 64. Iggy Pop *Wild Child* 65. Cole Porter *Night And Day* 66. Bud Powell *Bouncing With Bud* 67. Elvis Presley *Jailhouse Rock* 68. The Proclaimers *Letter From America* 69. Sergei Prokofiev *Romeo And Juliet* 70. Giacomo Puccini *La Bohème* 71. Serge Rachmaninoff *Piano Concerto No 2* 72. Otis Redding *The Dock Of The Bay*

*Overture* 90. U2 *Rattle And Hum* 91. Guiseppe Verdi *La Traviata* 92. Gene Vincent *Be-Bop-A-Lula* 93. Antonio Vivaldi *The Four Seasons* 94. Richard Wagner *Tristan and Isolde* 95. Fats Waller *You Rascal You* 96. Muddy Waters *You Can't Lose What You Ain't Never Had* 97. The Who *My Generation* 98. Jacky Wilson *Reet Petite* 99. Stevie Wonder *Uptight (Everything's Alright)* 100. Lester Young *These Foolish Things Remind Me Of You*

Music. We can't think of a better reason for visiting us. **IN HI-FI**

IN HI-FI, 63 GEORGE STREET, EDINBURGH. TELEPHONE 031-225 8854. WESTOCK KEF, MISSION CYRUS, MERIDIAN, QED, MUSICAL FIDELITY, MARANTZ, CASTLE, HEYBROOK, DENON, AR, ARCAM.

by **ION** SYSTEMS

**X-PAK 1** 120 VA. POWER SUPPLY SYSTEM ION SYSTEMS

**OBELISK 3X** STEREO INTEGRATED AMPLIFIER ION SYSTEMS

POWER TAPE TUNER AUX/CD

ION SYSTEMS LTD, 61 Mochdre Business Park, Newtown, Powys, SY16 4LE. Tel (0686) 25266 Fax (0686) 25241

# THORENS TD160S Mk II

PORTFOLIO MARKETING LTD., HILLBOTTOM RD., SANDS IND. EST., HIGH WYCOMBE, BUCKS HP12 4HT. TEL: (0494) 463345.

RECOMMENDED



Certainly Thorens' most famous model, the *TD160S* is reassessed for this issue with the *TP16S Mk IV* arm, a package that sells for £249.90. The plain motor alone excluding arm, designated *TD160S Mk IV BC*, remains available at £229.90. In passing, it's worth noting the extraordinary amount of engineering that Thorens crams into these price points. And in a telling contrast to some competing decks from specialist suppliers, the *160* is a thoroughly user friendly design that mixes many key audiophile attributes with hassle free setup, sensible, friendly controls, a slipping clutch for smooth power take-up – even captive transit bolts.

The key design features mirror those of the *TD166*, but are significantly better executed, which is no less than you'd expect for the price. The platter, for example, has metallic inner and outer sections and is rather heavier, though Thorens spoils things a little by drilling the metal work with quite unnecessary access holes. Possibly as a result, the mat is relatively stiff and made of hard, thick rubber, where something like felt could well have suited better.

The outer plinth of the sample submitted for test was mahogany veneered with a black painted steel top plate. The inside story is the traditional one of a damped 3-spring suspension supporting a metal subchassis. The main bearing is substantial and very well made. The drive system uses a low voltage 16-pole mains locked motor driving a flat belt. Operation is by 3-position power/speed switch and a matching cueing control.

The *TP16S* arm is an elaboration of the *TP21* arm used on the *TD166*. Basically it is a conventional straight armtube/offset headshell design, with good bearing geometry, but it is distinguished by two features: the friction free magnetic sidethrust compensation, and the spring applied, dynamically balanced tracking force (in the Dual, Linn etc mould), which amongst other things

enables effective mass to be reduced – by quite a lot in this instance.

## LAB REPORT

The promised lower arm mass is delivered – 7g is a respectably low figure that gives the design something approaching universality, favouring high compliance cartridge though arm height is not adjustable. However, the arm resonance plot is very busy, with a mass of unresolved resonances extending from a few hundred Hertz. Although the bias compensation is accurately calibrated, tracking force calibrations read around 20 per cent light. Bearing friction is low, especially laterally, but there is detectable free play. The motor unit is well behaved. Disc termination is resistive and well damped, whilst electrical and acoustic breakthrough are well controlled. Speed stability is fair and rumble is very well suppressed.

## SOUND QUALITY

This deck has some difficulty resolving very fine detail cleanly, and there is some mid-band untidiness and lack of coherent stereo focus and perspectives too, possibly due to bearing rattle when the arm is thoroughly energised by music.

But the problem areas never dominate. The *TD160* is well known as a consistent and believable maker of music, allowing access to the fine inner structure, and possessing a powerful, involving quality. The bass is particularly deep and clean. The player is also consistent with level up to quite high volume levels.

## CONCLUSIONS

By and large, this well known piece of everyday exotica is as competitive as ever. It is possible to achieve better results with the right choice of third party arm, but the advantages are likely to be relatively small in most cases. Recommended.

## TEST RESULTS

### Motor section

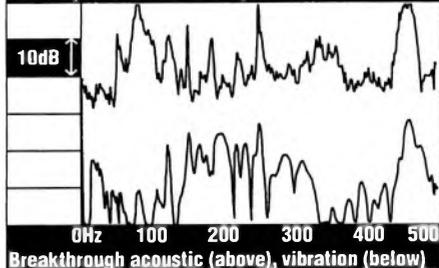
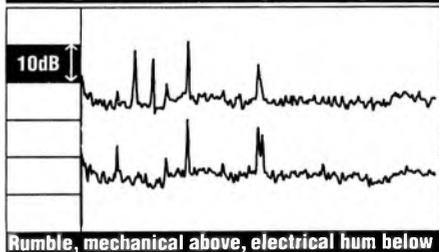
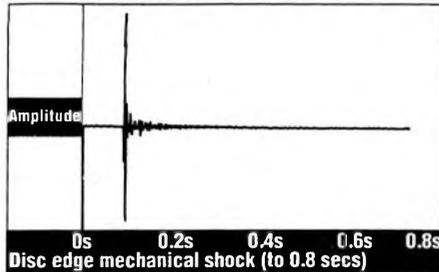
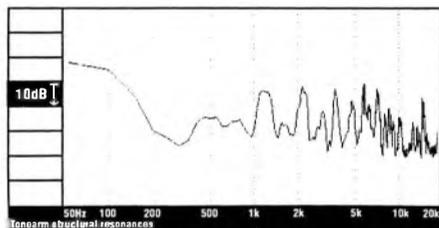
Type	manual integrated player
Platter mass/damping	3.1kg
Finish and engineering	above average
Type of mains connection leads	detachable, transformer in lead
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.12%/0.26%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.29%/0.044%
Absolute speed error	-0.41%
Speed drift 1 hour/load variation	synchronous/-0.76%
Start up time to audible stabilisation	3.5 sec
Rumble DIN B Wtd L/R/L+R	-80dB/-84dB/-86.5dB

### Arm section

Approx effective mass inc screws, excl cartridge	7g
Type/mass headshell	semi-fixed
Geometric accuracy	very good
Adjustments provided	overhang/lateral
Ease of assembly/set-up/use	good
Friction (typical) lateral/vertical	<10mg/20mg
Bias compensation method	calibrated dial
Bias force, rim/centre (set to 1.5g elliptical)	180mg/180mg
Downforce calibration error 1g/2g	-0.25g/-0.4g
Cue drift	moderate
Cue rate ascent/descent	1 sec/3 sec
Arm resonances	below average
Arm damping method	none

### System as a whole

Size (h x w x d)/clearance for lid rear	15.5 x 44 x 36cm/6cm
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	average+
Hum level/acoustic feedback	good/average
Vibration sensitivity/shock resistance	average
Estimated typical purchase price	£249.90



# THORENS TD320 Mk II

PORTFOLIO MARKETING LTD., HILLBOTTOM RD., SANDS IND. EST., HIGH WYCOMBE, BUCKS HP12 4HT. TEL: (0494) 463345.



This is another reassessed model from Thorens that has been subtly refined over the last few years – most recently with a brand new *TP90* arm. At the core of the £350 *TD320* is a main bearing, subplatter, outer platter assembly and flat rubber mat which appear to have been lifted straight from the *TD160*. The rest is different. The motor is a new low voltage 16-pole unit, which in contrast to other Thorens' models synthesises the motor drive waveform so that speed switching is electronic. Thus only a single diameter pulley is required, fitted with Thorens' usual slipping clutch.

The main difference from the *TD160* is the suspension system. In place of the coil spring/metal subchassis is a split chassis, one part suspended quite freely from the other using leaf springs which can be adjusted from above. The suspended part couples the platter to the arm, and decouples both from the environment.

The *TP90* arm is a well made, normal counterbalance design, with magnetic bias compensation, good geometry bearings, a height adjustment facility and a straight, rigid armtube. The offset headshell is interchangeable, but it uses a novel, very long coupling with two locking spigots in the manner of some of the enhanced 'standard detachable' headshells that had brief popularity some years ago.

The player is extremely well built and finished, and easily set up. Operation is semi-automatic: the deck employs a friction-free velocity sensor which detects the movement of the arm in the runout groove, and lifts the stylus, simultaneously resetting the cueing lever and cutting drive to the motor.

## LAB REPORT

Wow and flutter is significantly better than with the *TD160s*, which is a tribute to the new motor and servo. Platter termination offers good damping, *TD160* style. Rumble

and electrical noise are also even lower than with that model, and acoustic breakthrough and vibration resistance look better on paper too, helped perhaps by the less rattly build quality.

The *TP90* is a high mass arm, geared towards low compliance cartridges. It has low measured friction, but the bearings have a small amount of free play. Bias compensation decreases quite sharply towards the inside of the record, and the tracking force scaling is miles out. Use an external gauge, or set tracking force by ear (which is easier than you might think). The arm has its first severe breakup mode at a satisfactorily high 1.2kHz, but the arm is fairly lively thereafter.

## SOUND QUALITY

This is not as exciting a turntable as some, but it is very well controlled – and nearly classless in the sense that it sounds completely at home in a wide range of systems. The overall subjective impression is of consistency and neutrality. The *320* is palpably neutral in most respects, and goes loud in a calm, clean manner – there's no obvious change in character as the volume is raised, and the bass retains its character and shape.

Stereo imagery is not quite as holographic as some, and some subtle information, typically related to the shape and scale of the acoustic space captured on record, tends to be restrained. But the same consistency pervades. Images don't wander; they don't shift as a result of volume or pitch changes, and there is instrumental separation of the kind that allows simultaneous quiet and loud sounds to be followed together.

## CONCLUSIONS

This is an attractive and quietly proficient record player that is plainly much improved with the new arm. It lacks only a touch of star quality and – unusually for Thorens – sufficiently attractive pricing.

## TEST RESULTS

### Motor section

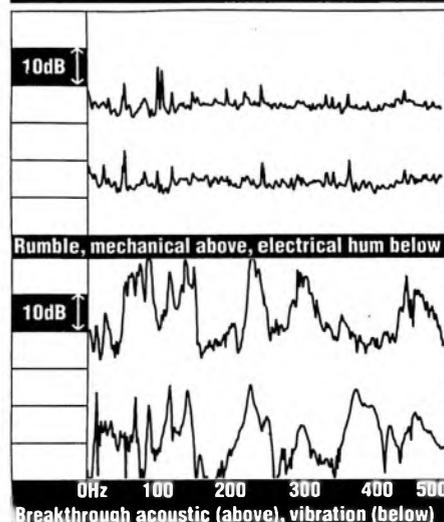
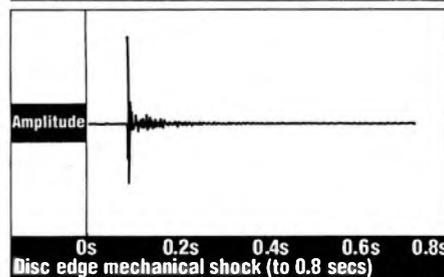
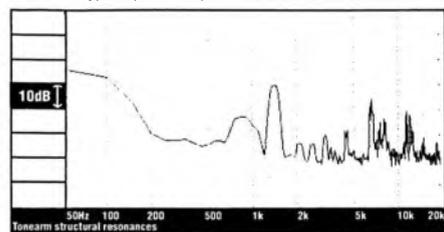
Type	semi-auto belt drive integrated player
Platter mass/damping	3.1kg/good
Finish and engineering	excellent/good
Type of mains connection leads	detachable, transformer in lead
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.10%/0.22%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.18%/0.064%
Absolute speed error	+0.16%
Speed drift 1 hour/load variation	+0.03%/–0.69%
Start up time to audible stabilisation	7 sec
Rumble DIN B Wtd L/R/L+R	–81dB/–84dB/–84dB

### Arm section

Approx effective mass inc screws, excl cartridge	14g
Type/mass headshell	detachable/10g
Geometric accuracy	very good
Adjustments provided	overhang, lateral, height
Ease of assembly/set-up/use	good
Friction (typical) lateral/vertical	<10mg/<10mg
Bias compensation method	magnetic
Bias force, rim/centre (set to 1.5g elliptical)	160mg/125mg
Downforce calibration error 1g/2g	–0.2g/–0.4g
Cue drift	slight
Cue rate ascent/descent	<1 sec/3 sec
Arm resonances	average
Arm damping method	none

### System as a whole

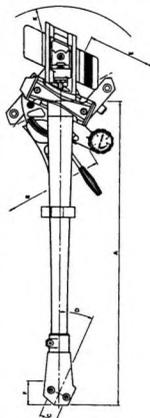
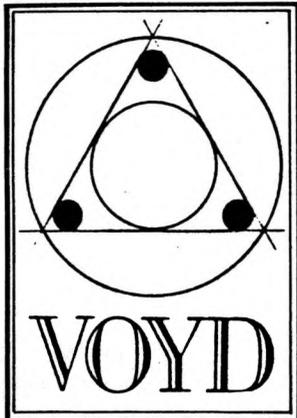
Size (h x w x d)/clearance for lid rear	17 x 44 x 35cm/9.5cm
Typical acoustic breakthrough and resonance	good
Subjective sound quality of complete system	good
Hum level/acoustic feedback	very good
Vibration sensitivity/shock resistance	good
Estimated typical purchase price	£349.90



## EVEN ORDERS

### THE ANALOGUE OPTION.

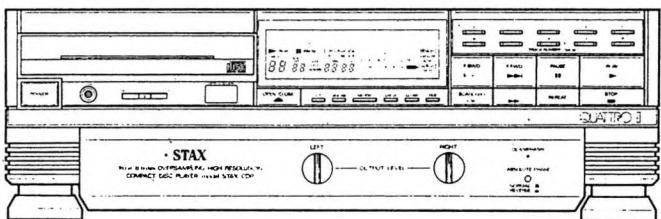
With a significant proportion of enthusiasts still committed to the long-term use of analogue equipment,



an opportunity to acquire one of the most thoughtfully designed combinations to emerge in the post-cd period: The **VOYD** turntable, **SME Series 310** tonearm, **R.A.T.A.** Torlyte support and, *free of charge*, an **Audio-Technics AF-OC7** cartridge ..... **£1595**

### THE DIGITAL SOURCE.

Newly available in the U.K., the Quattro II has



## STAX<sup>®</sup>

already achieved reference status. In addition to its sonic performance, it offers a level of design and build quality unlikely to be surpassed even in this fast growing technology. Its price of £2995 includes a complete home demonstration and installation service.

### THE AMPLIFIER INFLUENCE.

Significant recent additions are the **Matisse** Reference valve pre-amplifier and the **Aragon 004** Series power amplifiers. The former represents the first attempt by a U.K. manufacturer to apply proven valve design principles to practical ends at a realistic price level (**£2995**), while the latter continue the outstanding tradition of U.S. amplifier design, but are the first to offer it at the cost of domestic units (**£1195; £1795.**)

For full details of current products and services, including guaranteed second-hand equipment, contact:

## PHONOGRAPH

60a Erpingham Road, Putney,  
London SW15 1BG.

Tel: (01) 789-2349

Mon.-Fri. 10am-1pm, 3.30-8pm.  
Sat. 10am-1pm.

Demonstrations by appointment.  
Free delivery UK mainland.

**FULL EXPORT FACILITIES AVAILABLE**

♯ 1 2 3 4  
 ♪ **WELL YOU CAN**  
 DO ANYTHING  
 ♪ ♪ ♪  
 BUT LAY OFF OF  
 MY  
 BLUE SUEDE

**CLICK**

## IT WON'T HAPPEN WITH THE NEW DENON 100.

Nothing's worse than a favourite song cut short because the tape isn't long enough.

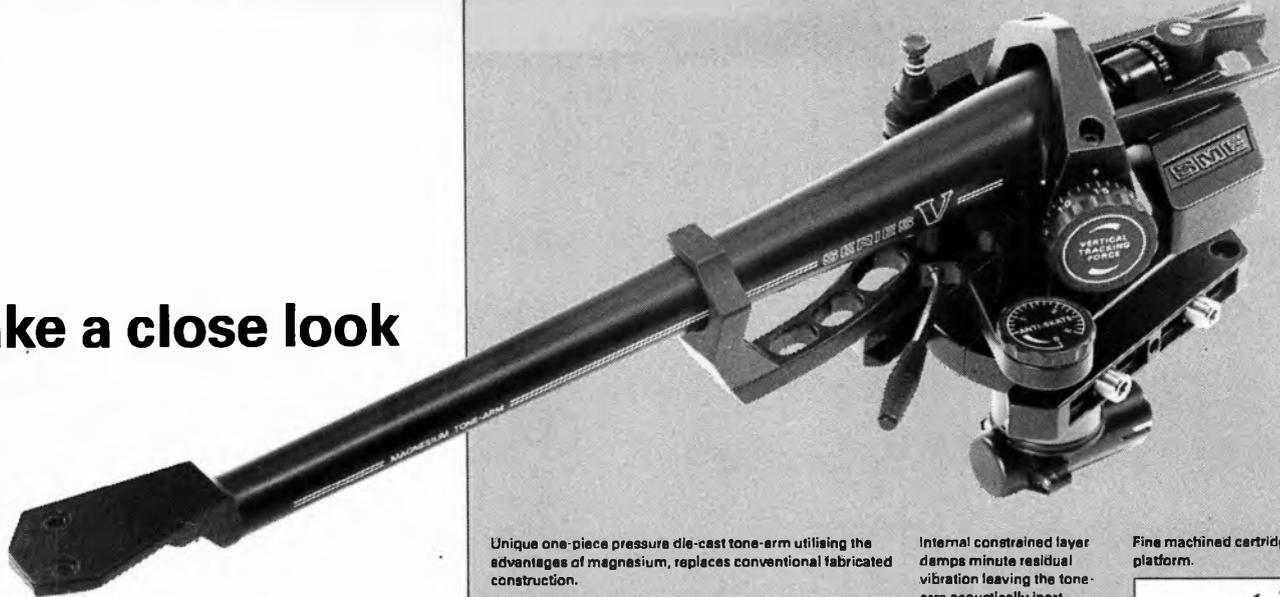
Now the new Denon 100 gives you a full 100 minutes playing or recording time on high quality chrome or metal tapes. (Making them ideal for CDs and longer albums).

Ask your local stockist for details of the full Denon Range.



Distributed by Hitachi

# Take a close look

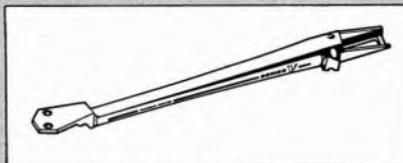


A close look at the unique Series V precision pick-up arm will reveal a wealth of design and engineering features of which only twenty are illustrated on this page. Some of these are concerned with ease and accuracy of adjustments essential for optimum cartridge performance; from others stem outstanding sonic qualities enabling the full detail and dynamics of the music to be heard, often for the first time.

It is said that the best reproduction of LPs ranks next to the original performance for the critical home listener and the Series V used in concert with a comparable cartridge and deck will do much to reinforce this opinion.

The arm is described in greater detail in a four-page colour brochure which we shall be happy to send you on request.

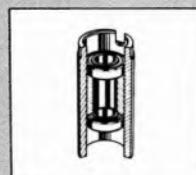
Unique one-piece pressure die-cast tone-arm utilising the advantages of magnesium, replaces conventional fabricated construction.



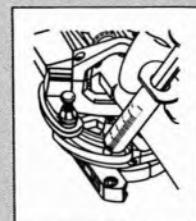
Unique assembly gives high rigidity and allows bearings to be critically adjusted before tone-arm is fitted.



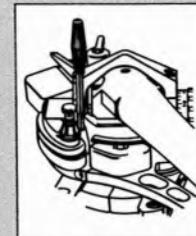
23mm diameter steel pillar, heat treated, ground and honed, carries two 17mm ABEC 7 ball races, widely spaced to resist tilt.



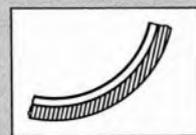
Subsonic lateral mode fluid damper can be instantly adjusted or cancelled.



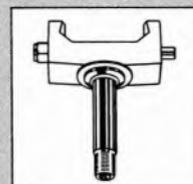
Fine adjustment of arm height (VTA).



Internal constrained layer damps minute residual vibration leaving the tone-arm acoustically inert.



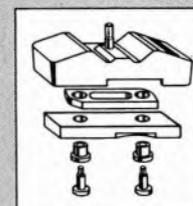
Stainless steel vertical shaft, ground and thread ground, with integral 16mm diameter flange to couple shaft and yoke.



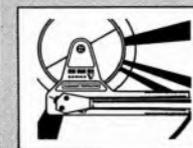
Anti-skate control operates through tension spring and filament. Dial corresponds with VTF and has positive OFF position.



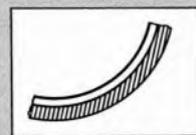
Tungsten-alloy balance weight carried on damped two-point suspension. Extra-low inertia design assists warp riding.



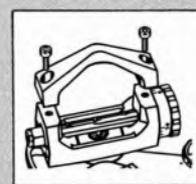
New design alignment protractor sets HTA with great accuracy.



Internal constrained layer damps minute residual vibration leaving the tone-arm acoustically inert.



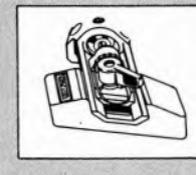
Stainless steel cross shaft, ground and thread ground. Carried in massive yoke on 10mm ABEC 7 ball races. Axis at record mean level to minimise warp-wow.



Lowering/raising control gives smooth positive action. Height of lift can be adjusted.



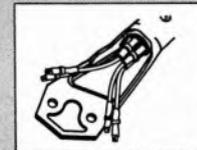
Understung weight housing corrects centre of gravity and provides non-reflective tone-arm termination. Adjustment leadcrew journalled in twin ball races with lever clamping.



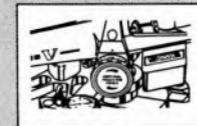
Advanced jig/template system guarantees correct positioning.



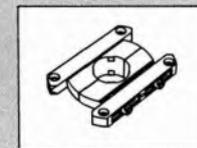
Fine machined cartridge platform.



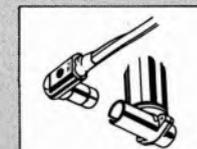
Dynamic balance - graduated vertical tracking force (VTF) control applies 0-3 grams x 0.125 gram through resonance controlled spring.



Dual-lock base provides movement control with high rigidity.



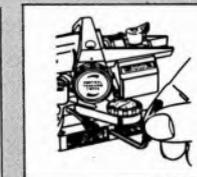
Swivelling damped output-socket minimises vibration transmission in sub-chassis use.



Reference lines on tone-arm facilitate VTA setting.



Fine adjustment of horizontal tracking angle (HTA).



# TOWNSHEND AVALON

TOWNSHEND INT., UNIT 2, NORTH WEYLANDS IND. EST., MOLESLEY RD., WALTON-ON-THAMES, SURREY TEL: (0932) 246850.

RECOMMENDED



Townshend's new lower cost player retains the key Cranfield Institute of Technology derived features made familiar by the original *Rock*, including the radial silicone-filled trough which damps the arm/cartridge LF resonance by clamping the arm solid at low frequencies using an outrigger attached to the headshell. Various arms can be specified, but for this test the *Avalon* was fitted with a Rega *RB250*.

The new *Rock*-like looks neater and more modern than any previous *Rock* incarnation. The plinth has a smooth, shiny laminated top, and is edged with a metal wrap-around strip. The platter consists of just under 2kg of black PVC sitting on an alloy subplatter and inverted main bearing whose tip is at its centre of gravity.

The record is clamped over a dome washer which forces the playing area into intimate contact with the platter. The drive system has a manual speed change, and the motor is a synchronous design driving a vaguely round section belt. Environmental isolation is provided by three Sorbothane ball feet. The fluid filled trough is like the one fitted to previous *Rocks* except that to save cost it's made of plastic rather than metal. It is swung out of the way to change records, adding a few seconds overhead to the task of playing a record. I was impressed by the build standards of this deck, which is by far the best yet from this small but innovative engineering based outfit.

## LAB REPORT

Wow and flutter of the (early) test sample was high, the 0.54% measured linear wow being just audible with some music. There's relatively little bearing rumble, and the spectrum analysis is favourable. Electrical hum is also low except for a sharp breakthrough spike at 100Hz.

Structurally, the deck displays some shortcomings. However, the platter, which

shows some sharp initial ringing following a transient shock, does in fact damp very quickly. The unit also behaved poorly in the vibration and feedback tests, in both cases showing some severe coupling at 150Hz, in a narrow band centred on 250Hz and again at higher frequencies. Yet, to show the efficacy of the design, it's interesting to note that very little energy from the motor appears on the cartridge output – even though the motor is rigidly clamped to the main chassis.

Aside from damping the LF arm/cartridge resonance as claimed, the effect of arm damping in the test set-up (Rega *RB250*/Audio Technica *AT-F5* cartridge) was most beneficial. Arm structural resonances were reduced by an average of 4.5dB over most of the 20kHz audio bandwidth. It's worth noting, however, that resonances in the plinth system are not as well damped as they are in the more expensive *Rock* turntable, and maybe the fluid trough itself is the cause of some resonances.

## SOUND QUALITY

It's not bad, but I remain mildly disappointed by this player. The measured wow problem was readily audible given the right (wrong?) kind of music, which is not a good start, though it's safe to assume that our review *Avalon* was a rogue sample.

Perhaps more difficult to resolve is the deck's disappointingly thick sound quality. The senior *Rock* is able to layer the sound and provide explicit image placement at low frequencies, but the *Avalon* is not really in quite the same class. The deck is dynamically muted too when compared to the *Rock*, though clearly one needs to take into consideration the £150 price saving. Indeed some dealers who stock Townshend turntables claim to prefer the softer overall sound balance of the *Avalon*, feeling that its easy-going nature marries in better with the majority of hi-fi systems they sell.

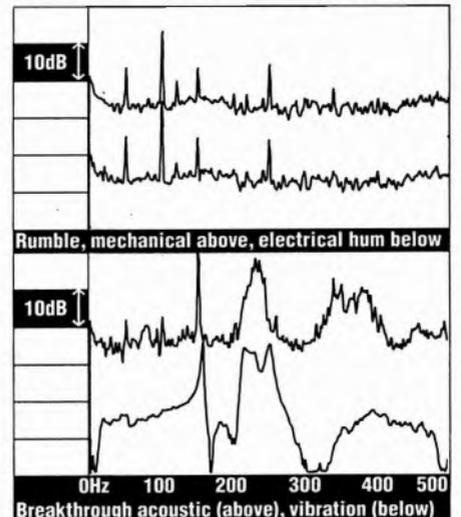
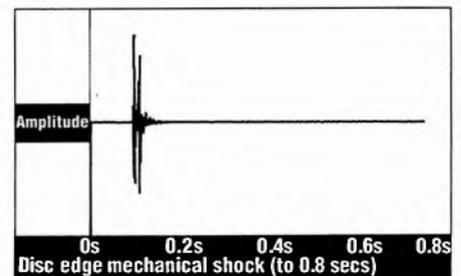
## CONCLUSIONS

The *Rock* has come a long way since the original model which had a Granitan composite platter and a large area, high drag bearing. Remove the damping trough from this deck and you have something that is well enough finished but not particularly distinctive; with the damping trough in position, resonances and perceived colorations are substantially reduced.

I'm not a great fan of the *Rock*-type sound, but other audio commentators (our Editor included!) swear it's the closest you can get to the sound of the original master tape recording. Clearly, then, you should audition it for yourselves to see whether you think the Cranfield Institute's arm damping ideas offer the closest approach to the original sound.

## TEST RESULTS

Type	manual belt drive motor unit
Platter mass/damping	1.9kg/average
Finish and engineering	good
Type of mains connection leads	captive 3-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.32%/0.64%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.54%/0.084%
Absolute speed error	none
Speed drift 1 hour/load variation	synchronous/-0.51%
Start up time to audible stabilisation	6 sec
Rumble DIN B Wtd L/R/L+R	-76dB/-77dB/-81dB
Size (h x w x d)/clearance for lid rear	15 x 43.5 x 36cm/8cm
Ease of use	poor at first, practice helps
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	good
Hum level/acoustic feedback	average
Vibration sensitivity/shock resistance	poor
Estimated typical purchase price	£299



**SONY**  
**HI-FI**  
**NEWS**  
&  
**RECORD REVIEW**

*Dealer Awards*  
*1988*

REGIONAL WINNER

audio eXcellence



*acoustat, acoustic energy, ar, alphason, a&r arcam, audiolab, audio research, audio technica, b&w, dual, celestion, deltec, denon, gale, heybrook, kef, koetsu, krell, linn, magneplanar, marantz, meridian, martin logan, quid, missio, revolver, mordaunt short, monitor audio, nad, nakamichi, naim, pink triangle, quicksilver, sme, revox, rotel, spendor, sd acoustic's, systemdek, tannoy, thorens, trio-kenwood, wharfedale, yamaha*

## NATURAL SELECTION

134/6 CRWYS RD, CARDIFF (0222) 228565

9 HIGH ST, SWANSEA (0792) 474608

58 BRISTOL RD, GLOUCESTER (0452) 300046



**MISSION**

# WELL TEMPERED TURNTABLE & ARM

ABSOLUTE SOUNDS LTD., 318 WORPLE RD., LONDON WS20 8QU. TEL: (01) 947 5047.

RECOMMENDED



Almost no feature of this player is as you'd expect. Even lifting it up is not for the unwary since the motor and a section of plinth associated with it stay behind, being totally separate. The platter is a dished acrylic item with a screw clamp. The synthetic flat peripheral drive belt certainly isn't as you'd expect, and neither is the complete lack of suspension. Instead structural control is maintained by a heavy composite chassis of Medite sandwiching about 14lbs of lead. The heavily weighted AC motor has a plastic drive pulley with steps for the two different speeds.

The well into which the spindle fits is massively oversize, and is filled with silicone fluid. The platter and inner bearing are restrained by plastic (PTFE?) studs inside the bearing well – and the drive belt.

If it's possible, the arm is even more idiosyncratic than the turntable. The aluminium armtube is unfashionably thin and the headshell a screwed-on cross member which offers a small area of contact to the fingerlift and only indirect contact to the armtube. The fingerlift can even be rotated to adjust the offset angle.

The real novelty, however, is the 'bearing'. The arm is literally suspended on a hoop of what appears to be fishing line, in a vice like arrangement that can be opened to vary the amount of twist which acts to provide bias compensation. An enormous paddle attached beneath the pivot sits in a well of high viscosity silicone fluid, and is heavily damped to say the least. The arm has very simple, quick methods of adjusting cartridge azimuth (as viewed from the front), VTA and several other parameters.

## LAB REPORT

The first resonance of this otherwise well damped, low mass arm is a bending mode at the cartridge/arm mount, and this turns out to be a critical point. Merely adjusting the

mounting screws is enough to place the resonance anywhere from 300-800Hz. Everything else is adjustable or peculiar: geometry is arbitrarily good, while friction doesn't exist at all in the formal sense.

The player is only slightly less odd. Speed stability is good and motor breakthrough moderate. The plinth acts as a somewhat uneven mechanical filter, being microphonic around 170Hz, and the platter tends to ring too, with several discrete frequency components identified by spectrum analysis.

## SOUND QUALITY

On audition, this deck possesses a lovely '3-D' quality. The treble is sweet and pure, the midband 'liquid', and the bass, perhaps surprisingly, is light and crisp. Timing is a strong point. The deck has a sharp attack, a clear sustain and releases quickly once the stimulus has passed. More striking than any of this, however, is the sense of quiet between notes – and on a grander scale, the extraordinary way the whole soundstage is laid bare.

For all this, the sound is slightly 'over-damped', and detail is not as explicit as with some competitors. But if asked to pinpoint a quality that is truly out of character, it is that the WT doesn't go quite far enough along the road the designer has mapped out. The arm especially sounds microphonic at quite high frequencies, and is responsible for an overlay of coloration on the sound. This can be shifted around a bit by tweaking the setting up, but not completely eliminated.

## CONCLUSIONS

Those who love the sound of a good valve power amp ought to feel comfortable here. The Well Tempered combination is all about feeling comfortable with your record collection. It challenges dogma by breaking every tenet of traditional thinking, yet provides living proof that there is another way – and it works; Recommended.

## TEST RESULTS

### Motor section

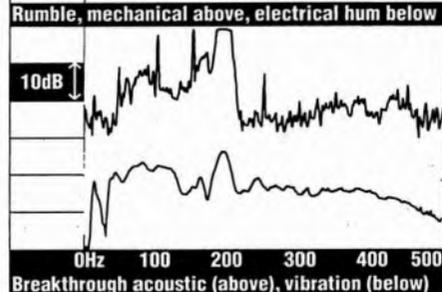
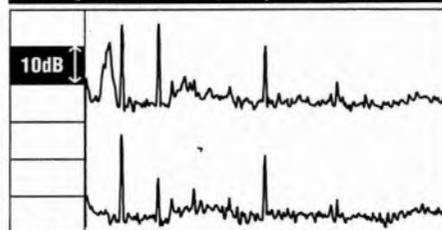
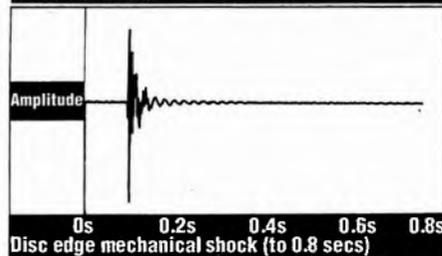
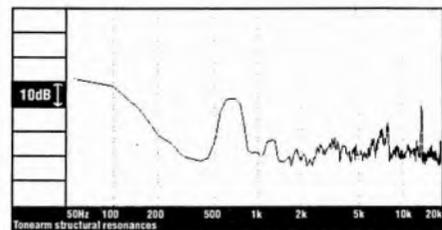
Type	manual belt-drive player
Platter mass/damping	1.75kg
Finish and engineering	very good
Type of mains connection leads	captive, 2-core
Speed options	33/45rpm
Wow and flutter (DIN peak Wtd)	0.11%/0.14%
Wow and flutter (Lin peak Wtd 0.2-6Hz/6-300Hz)	0.14%/0.058%
Absolute speed error	-0.13%
Speed drift 1 hour/load variation	synchronous/-0.09%
Start up time to audible stabilisation	1.5 sec
Rumble DIN B Wtd L/R/L + R	-76dB/-79dB/-79dB

### Arm section

Approx effective mass inc screws, excl cartridge	7.5g
Type/mass headshell	fixed
Geometric accuracy	excellent
Adjustments provided	tilt, overhang, lateral, height
Ease of assembly/set-up/use	average
Friction (typical) lateral/vertical	n/a
Bias compensation method	twisted thread
Bias force, rim/centre (set to 1.5g elliptical)	130mg/150mg
Downforce calibration error 1g/2g	n/a
Cue drift	poor
Cue rate ascent/descent	n/a/1 sec
Arm resonances	below average
Arm damping method	very viscous fluid and heavy decoupling

### System as a whole

Size (h x w x d)/ clearance for lid rear	18 (to top of arm) x 48 x 39cm
Typical acoustic breakthrough and resonances	average
Subjective sound quality of complete system	very good
Hum level/acoustic feedback	good/below average
Vibration sensitivity/shock resistance	good
Estimated typical purchase price	£1690 (optional cover £75)





# JOIN THE CROWD

Join the crowd now going to Doug Brady Hi-Fi. An increasing number of people are discovering that at Doug Brady Hi-Fi 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.

Since opening the London shop last year

there have been so many customers listening and buying we have had to double the number of staff. We have also quadrupled our stock and to fit it all in we've almost doubled our size by taking over the shop next door.

If you are looking for the best in hifi, and the best place to buy it, phone us to book a demonstration.



## Doug Brady Hi-Fi

Kingsway Studios,  
Kingsway North,  
Warrington, Cheshire.  
(0925) 828009.  
Open six day .

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.  
Open seven days.

We stock AE · AR · Alphason · Apogee · Apollo  
Arcam · Ariston · Audiolab · Audioplan · Audio  
Research · Audio Technica · Beyer · B+W  
Cambridge · Castle · Celestion · Chord · Creek  
Cyrus · Denon · DNM · Dual · Elite · Epos  
Foundation · Gale · Goldring · Goodmans  
Heybrook · Infinity · Jecklin · JPW · KEF · Koetsu  
Krell · Linn · Linx · Magnapan · MAP · Marantz  
Meridian · Michell · Mission · MA · Mordaunt Short  
Moth · Musical Fidelity · NAD · Nagaoka · Naim  
Nakamichi · Oracle · Ortofon · Oxford · Philips  
Pink Triangle · QED · Quad · Rata · Revolver · Revox  
Rogers · Roksan · Rose · Rotel · Royd · Ruark · SD  
Sennheiser · Slate · SME · Sonus Faber · Sony ES  
Spica · Stax · Systemdeck · Tannoy · Target · TDK  
Thats · Technics · Van Den Hul · Veda · WBT  
Wharfedale · Yamaha · among others.

### BRADY'S THE MUSICAL EXPERIENCE!



**BADA**



# TURNTABLES AND ARMS TECH TALK

*Alvin Gold explains the technicalities behind the turntable and tonearm reviews.*

The test programme for the turntables and tonearms is mostly represented by the plots and tabulated measurements at the end of each review, though some test results are not reproduced. An example is the spectrum analysis of platter impulse behaviour, which is not shown for lack of room, though they are referred to where appropriate.

At this point I acknowledge my debt to Martin Colloms, who established and refined the basic form of the bench tests over the years – tests I have aimed to emulate as far as possible. Indeed, MC is still responsible for the arm tests.

Four turntable plots are reproduced. One shows the effect of disc damping according to the 'Moncrieff method', the essential features of which include exciting the platter with a shock at its periphery (applied at 45 degrees to the horizontal) and placing a transducer (the cartridge) at the opposite end of the disc diameter. The equalised output is captured and displayed as a level vs time plot. Points to look for here are the rate at which excitation dies away, and the presence of any dominant resonant modes (bell modes for example) which will show as a slowly dying sinewave superimposed on the output. The absolute level of the initial transient is arbitrary in these tests, only the shape of the succeeding disturbance is of interest.

The other plots are made similarly, but following impulse capture the resulting information was analysed by the Fast Fourier method, and presented as a spectrum analysis over a 0-500Hz range (linear, not logarithmic). The breakthrough plots show acoustic breakthrough, which is the effect of excitation of the complete system by a high level pseudo music signal (pink noise) from a nearby wide-bandwidth loudspeaker. Below this is a plot labelled vibration, which represents the deck's response to a large impulsive shock fed to the (isolated) shelf on which the turntable stands. The motor and rumble analysis plots are made in

analogous fashion, but the cartridge sits on the platform of a Thorens rumble coupler attached to the turntable spindle. The upper plot shows rumble plus electrical noise, the lower the electrical contribution on its own, with the platter stationary.

In all cases, absolute levels should be ignored – it's the trends that count. Look suspiciously at decks which sharply favour certain parts of the audio frequency spectrum above others. The arm analysis is similar to the other spectrum analysis plots except that the frequency bandwidth measured is 20kHz and the x-axis is logarithmic.

The other measurements need little explanation, but include numerical test results for rumble (providing the absolute levels missing from the spectrum analysis plots), wow and flutter (with the two components separate, and together in both weighted and unweighted form), a figure for absolute speed error, slowing under load and so on. For this issue we were able to eliminate some residual noise from the system which means that the test results look about 3-4dB better than before – take care when comparing with results from back issues. In the case of the arms the most important measurements concern effective mass (the inertia experienced by the cantilever, which dictates cartridge compatibility) and friction levels, any comments arising being included in the reviews.

Let me finish this section with a short plea concerning the interpretation of test data. It has often been said that a properly informed laboratory measurement programme is the only properly dispassionate and analytical tool for the assessment of turntable and arm behaviour, not to mention other high fidelity components. In my opinion this view, if unqualified and used simply as a stick with which to beat the so-called subjectivists, betrays a lack of understanding, not least of scientific method.

In particular, of course, even the most complete structural

analysis of turntable behaviour begs many questions, such as the correlation (which has never been rigorously explored) between structural resonances and perceived sound quality. Obviously the link exists, but it is complex and difficult to quantify. If further proof is needed that lab test programmes don't hold the final key to understanding turntables, it is dramatically provided by the fact that a clear appreciation that turntables sound different was scarcely even hinted at before Linn Products appeared on the scene.

So what purpose do lab tests serve, if any? My own reading is that the measurements can help inform and illuminate the listening, in the first case by suggesting where problems might arise, and in the second case by helping to provide explanations of phenomena that have been identified as a result of listening. But because the link between individual measurements and sound quality is so tenuous, at the present state of the art (or science) listening must always be the final arbiter, *not* measurements. The historical record provides all the justification any sceptic may need. You can't simultaneously get it so consistently wrong for

such a long period and still claim to have all the right answers...

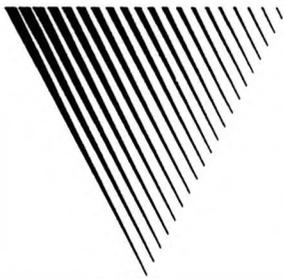
## BEHIND THE TESTS

The monitoring system was a high resolution one, consisting of DNM and Pink Triangle *Pip* preamplifiers, late sample Musical Fidelity *A370* power amplifier, and Apogee *Caliper* and Musical Fidelity *MC4* loudspeakers, all wired with solid core Mission cable (the loudspeakers bi-wired). For comparative purposes, several Audio Technica *AT-F5s* were used (from the specially selected '10th year in Great Britain' Limited Edition, which also features PC-OCC wiring). A Koetsu *Rosewood Signature* and an Ortofon *MC3000* was used for more critical listening with selected components.

A wide range of records was employed, drawn from a substantial library of old and new material in various genres. Classical and rock were played in roughly 60:40 proportions in line with the requirements of the tests – and of course, whatever music I felt like listening to at the time.

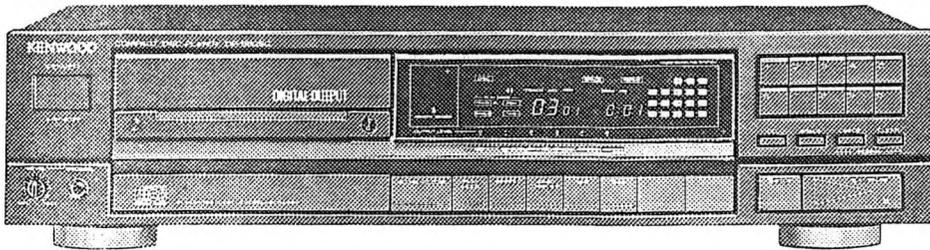
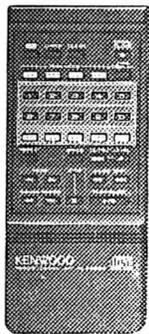
Thanks to Robert King, who played FFTs and rumble couplers; to Thorens, Kenwood, and Martin Colloms.





# KENWOOD

## HOME Hi-Fi



YET ANOTHER  
BEST BUY  
FROM  
KENWOOD

DP 880 SG C.I. PLAYER

### Movement Audio

588 Ashley Road,  
Parkstone, Poole  
Tel: (0202) 730865

### Weymouth Hi-Fi

Formerly Dorset Electronic Centre  
28/29 Walpole Street,  
Weymouth DT4 7HJ  
Tel: 0305 785729

### Salisbury Hi-Fi

15 Catherine Street,  
Salisbury SP1 2DF  
Tel: (0722) 22169

### Movement Audio

926 Wimbourne Road,  
Moordown, Bournemouth  
Tel: (0202) 529988

You won't believe  
your ears



### at the ASTON AUDIO

MUSICAL EVENING FOR ALPHASON  
SPECIALIST AUDIO PRODUCTS

STANNEYLANDS HOTEL  
STANNEYLANDS ROAD WILMSLOW  
8.30pm Tuesday, 31st January 1989

## ALPHASON SPECIALIST AUDIO

*Close your eyes and you're there at*

**ASTON AUDIO**

4 West Street, Alderley Edge, Cheshire. Telephone 0625 582704

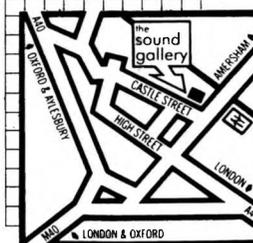
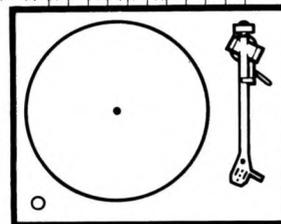


ALL CONSULTANTS ARE  
THE SAME. AREN'T THEY?

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 HP13 6RN  
TELEPHONE (0494) 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 ■





# TURNTABLES AND ARMS: CONCLUSIONS, BEST BUYS AND RECOMMENDATIONS

*Alvin Gold sums up the reviews with a round-up of the recommended models.*

It's encouraging to find that the hi-fi industry continues to support the 12inch 33.3rpm black vinyl record with apparently undiminished enthusiasm, and if I'm not mistaken quite good sales to show for its efforts. A time must come when the market begins to wind down; if for no other reason than the steady switchover from black to silver by the software industry. But it hasn't happened yet, and it shows no signs of happening imminently. A number of companies I spoke to during this test claimed to be selling everything they were able to churn out.

Anyone torn between buying either records or CD almost certainly won't be disappointed by a decision in favour of black vinyl (albeit these days probably in parallel to CD). The disadvantages of records are too well rehearsed to bear repetition here, but what is worth reiterating is that records are still capable of outperforming other sources, and yes I mean CD, though a very good record player and first class set-up will be essential.

The group of turntables, arms and integrated players covered in this issue mainly achieved a surprisingly high standard, though more than a few models had to be ruled out due to what should have been readily identifiable problems like excessive wow and flutter – a problem which simply shouldn't occur.

Our final list of Recommendations and Best Buys starts like this. There are two excellent sub-£100 players, the NAD 5120 (Best Buy) and the Dual CS430 (Recommended), both selling for £89. The two represent exceptional value for money and each is packaged complete with a simple magnetic cartridge. The NAD has been the subject of a useful updating exercise, and both looks and sounds in better voice than ever. The Dual, meanwhile, is simply much better than previous such mopping up exercises. Neither model really breathes fire, but you may be surprised by what

they can do.

Dual's mainstream CS505-3 (£139) continues to creep up in price, but again the specification continues to evolve in parallel. Anyone who hasn't set eyes on a 505 for a while will be surprised at what they see.

The antithesis of the Dual approach is found in the Thorens' models included in this issue. They are incredibly well engineered at their respective prices, and the arm designs seem to be improving, though not as fast as I'd like. The Thorens TD280 is a particularly good buy. The £150 price tag almost looks like a mistake at first glance, but the TD166, which costs only £30 more, is not far behind – both models achieve Best Buy. On the Recommended front Thorens's TD160S, now in Mk 4 guise, is less competitively priced at £249, but



*The Oracle Alexandria makes good.*

is still an excellent suspended subchassis/heavy platter model, and a very good platform for third-party arms. But I can't help thinking it would take so little to transform the TD160 into a truly excellent one.

All three Systemdek models achieved Recommended status – the Systemdek IIX (£248 with tonearm), which is the basic AC motor version of their mainstream range, the outboard power supply variant, the Systemdek IIXE (£248) and finally the more costly Systemdek IV (£495). The former can sound slightly congested but is

excellent value for money, especially as it has an effective suspension. The Electronic version is less cluttered and more informative. The IV looks a little expensive at first sight, and clearly needs more refinement, for example, to reduce wow and flutter. It's an excellent deck though, the acrylic platter apparently being responsible for some of the sweetness and depth.

Although mildly disappointed with the performance of the Townshend Avalon (£299) supplied for review, reports elsewhere have been very favourable and it's clearly well worth checking out.

At the expensive end of the market, things are moving too. The Source So (£675) is both a better and cheaper deck than its predecessor – an early success for the new management. The

ability to work at all, so effectively does it ride roughshod over every accepted tenet of turntable design. It's perfectly true that the WT doesn't do everything you'd expect a high class turntable to do – it's less detailed than some, and dynamics are definitely a touch restrained, notwithstanding some wildly over the top US press coverage to the contrary. Yet it has a natural sweetness and absence of artificiality that is quite special and could even be unique.

Finally, two of the three arms tested are Recommended outright. One is the Audio Technica AT1130 (£186), which is one of the few remaining respectable (but not ideal) low cost arms. The other is the Linn Ekos (£895), which is a from the ground up, no holds barred attempt at doing the Ittok again but to a much higher standard.

Also included in the group are a few of the better machines from previous tests, the Best Buy being Ariston's answer to the Dual 505 – the Q-Deck, a snip at £140. Three Recommended models have also been included – Heybrook's stalwart 772 and arm (£279/£249), the exquisite Michell Synchro (£265) and Alvin's reference – the venerable Roksan Xerxes (£655). For a listing of other recommended models from previous tests check the Directory.

## BEST BUYS

NAD 5120	(£89)
Ariston Q-Deck	(£140)
Thorens TD-280	(£150)
Thorens TD-166	(£179)

## RECOMMENDATIONS

Dual CS430	(£89)
Audio Technica AT1130	(£186)
Systemdek IIX	(£248)
Thorens 160SMk 4	(£249)
Michell Synchro	(£265)
Systemdek IIXE	(£248)
Townshend Avalon	(£299)
Systemdek IV	(£495)
Pink Triangle PT TOO	(£650)
Source So	(£675)
Linn Ekos	(£895)
Oracle Alexandria	(£825-£995)
Well Tempered Turntable and Arm	(£1,690)



# “W.H.A.A.T!”

“JUST LOOK AT THOSE BEST BUYS”  
(AND RECOMMENDED)

THEY'VE GOT THE DUAL 505-3  
IN STOCK NOW



We also have other “Best Buy” turntables on display –  
such as Ariston and Manticore.

WE HOLD COMPREHENSIVE STOCKS OF:

Aragon, Acoustic Energy, Akai GX Series & Video, Appolo, Audio Technica, Ariston, Cambridge Audio, Canton, Dual, Denon, Harmon/Kardon Infinity, Infinity-in-car, JBL, JBL-in-car, JPW, Kenwood-in-car, Maxell, Manticore, Monster, Musical Fidelity, Nakamichi, Nagaoka, Ortofon, QED, Rotel, Rose Valve Pre-Amp, Ruark, Supra, S.D Acoustics, Sansui, Stax, Sennheiser, Tannoy, Target, That's, Van den Hul, Linx

## ACOUSTIC ENGINEERING

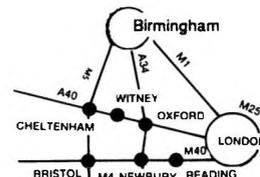
Unit 3, Range Road, off Downs Rd,  
Witney, Oxon.

Please ring (0993) 703053

If you cannot get to us personally we  
are happy to supply by post.

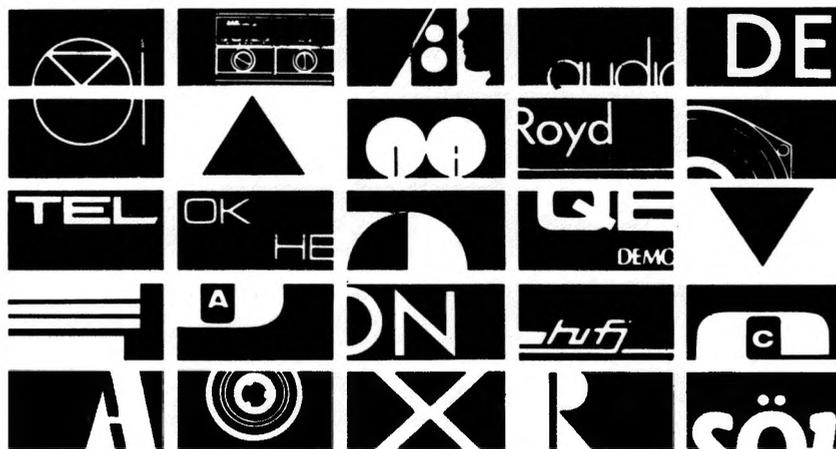
Access, Visa.

OPEN TUES TO SAT 9am to 6pm



▶ GOODMAN'S YAMAHA REVOLVER MARANTZ ONIX JWS HEYBROOK QED ROTEL

▶ OPEN 10am – 6pm. CLOSED WEDNESDAYS



## ▲ AUDIO VENUE ▼

24 CHURCH ROAD CRYSTAL PALACE  
LONDON SE19 2ET TEL: 01-771 7787

▶ LINN NAIM A&R CREEK DENON DUAL MANTRA BLQ ROYD

2 YEAR WARRANTY ON ALL GOODS FREE DELIVERY AND INSTALLATION INTEREST FREE CREDIT ◀



# CHOOSING AND USING . . . CARTRIDGES

*Paul Messenger guides you through choosing your cartridge and Paul Miller explains our test procedures.*

The cartridge is the 'business end' of the record playing system but is also a slave to the bigger mechanical components.

There are two common kinds of cartridge, moving magnet and moving coil: the former tend to be cheaper but the latter better. All amplifiers cope with moving magnets, but some of the cheaper amps don't handle moving coils.

One reason moving-coils are generally more expensive is that they are rather more difficult to manufacture. Because the mechanical engineering needed to make them work at all has to be more precise, the mechanical integrity of the generator assembly and its mounting tends to be inherently better too. Most MC types have fixed styli whereas most MMs have user-replaceable stylus assemblies, but the inconvenience of the fixed approach is merely another price paid for superior mechanical behaviour.

The mechanics of the generator within the body is only one element; the mechanics of the fit between body and headshell can also play a part. If the cartridge is not fixed really securely, it will of course move or vibrate at some frequency or other, and take the 'fine edge' off the sound. To have a reasonable chance of working well the body should be designed with strong fixing lugs and a flat headshell contact surface, so that the moving stylus/generator works against the whole cartridge/arm mass/stiffness (even the turntable itself), not just a poorly secured lightweight cartridge.

Most of the cost of a cartridge goes into the stylus and cantilever, so a range may share the same body while spanning a price difference of 5X, with differing standards of cantilever, stylus and quality control. These additional degrees of refinement have little if any effect at low and mid frequencies, which have much more to do with the mechanics and engineering of the whole moving element. Improved styli can enhance high frequency, but only if the turntable and arm is good enough not to scramble the potential improvement. However, one

additional reason for choosing a good quality cartridge is to give your record collection a better chance of retaining much of its original quality. A further reason for spending a little more for a cartridge is to make sure that the stylus is delicate and shaped accurately enough to preserve the record collection in the best possible condition.

A cartridge is a transducer, changing the mechanical stylus/groove energy into electrical energy. It therefore has a specific tonal balance, which is largely determined by the frequency response and in this respect cartridge selection can be a useful technique for 'fine-tuning' the overall balance of a system. Moving magnet cartridges often have a response which is modified by interaction with the characteristics of the amplifier; this is probably undesirable *per se*, but can be similarly useful nonetheless. Frequency response can also give an indication of the inherent mechanical integrity of a cartridge, but another key measurement, the stereo separation response, reveals any shortcomings much more clearly.

A final important factor is the mechanical matching of arm and cartridge, based on a simple mathematical formula so that the combination has its main mechanical resonance in the range of frequencies where it will do least harm.

This resonance is a major cause of record player ills, and cannot be avoided. Damping may be present in arm and/or cartridge, but this is no cure-all. More important is to place the resonance low enough to avoid upsetting the bass sound quality, but high enough to avoid excitation from disc warps. The generally accepted ideal range is 8-12Hz, but carefully chosen systems can operate satisfactorily a little beyond. Lowering the resonance can improve the bass reproduction, but usually at the expense of stability at higher frequencies, and vice versa.

## TEST PROCEDURE

For the laboratory testing a current specification Michell

*Gyrodec* turntable fitted with SME *Series V* tonearm was pressed into service, while my usual Pink Triangle *PT100/SME V* combination was utilised for the subjective evaluation. Stax *Lambda Signature* headphones (*SRM-T1* energiser) were used for critical alignment.

An Ortofon *TC3000* test computer was used for rudimentary checks on resonant frequency, phase, bias adjustment and tracking ability. All output and spectral analyses were conducted with both channels loaded: 47kohm/50-450pF (MM) and 10-200ohm (MC). This issue of *Choice* cartridges sees a new wideband frequency response running at  $\pm 5$ dB from 10Hz to 50kHz highlighting both ultrasonic and subsonic irregularities in the cartridges' output. The former may be of importance if 2nd or 3rd-order IMD is precipitated at the input stage of the amplifier, the distortion products tracking into the audio band. Stereo separation was assessed over this same bandwidth and although the plots have not been published any relevant data is discussed.

## Total Harmonic Distortion and Squarewaves

Assessed at 300Hz and 1kHz (+9dB or 31.6 $\mu$ m) without equalisation, this gives an indication of generator linearity vs frequency. The 2D plot also contains information concerning harmonic distortion at low and high frequencies, whereupon the distortion complement may be ascertained. Up to 20dB more 2nd harmonic products may be tolerated in comparison with the harsher-sounding odd-order distortions for instance. Values below 2 per cent are preferred.

The squarewave test (1kHz, 5cm/sec peak, lateral) contains information about the rise time, stability, tip mass and response of the cartridge. Linearity figures around or below -40dB represent very good results.

## High Frequency Distortion

This is a straightforward examination of a 10.8kHz tone (15cm/sec peak) modulated at a rate of 270Hz. Second-order

effects dominate this result so the profile of the stylus, vertical replay errors and tracking prowess all come into play. The published figures are *without* equalisation and are therefore strictly related to the linear performance of the cartridge. Remember, the ratio of 270Hz product to 10.8kHz signal will be altered by 20dB through RIAA equalisation in an amplifier. For a 'real-life' result you should multiply distortion by 10.

## SMPTE IMD/Distortion Plot

Lateral tracing errors inherent with all pivoted arms will produce large amounts of second-order distortions, so the analysis of 3rd-order *generator* non-linearities is a worthwhile exercise. A SMPTE IMD test is also run at +9dB or 31.6 $\mu$ m and uses two tones at a 4:1 (12dB) ratio - these are the 400Hz and 4kHz signals displayed on the accompanying distortion plots. The geometry-related 2nd-order products can be seen at 3.6kHz and 4.4kHz while the subjectively important 3rd-order products are visible at 3.2kHz and 4.8kHz. Note also the 2nd harmonic of the 4kHz signal at 8kHz and the subsequent 400Hz sidebands arising from that IM interaction.

## Vertical Tracking Angle

Few styli are set near the IEC standard of 20 degrees, though most commercial records are cut some 3-5 degrees above this.

The VTA is assessed using a special record containing two tones (370Hz/630Hz) which are cut at a progressively increasing vertical angle; when the cartridge VTA matches that on the record then the 1kHz 2nd-order IMD product is at its lowest. However, as some cartridges appear to exhibit a VTA in excess of 30 degrees (a physical impossibility in some cases) we must assume that this test is highlighting geometric non-linearities in the generator as well as the stylus/groove interface. Either way, such cartridges will still be incurring a high vertical distortion (and therefore compromising the lateral stereo imaging) when replaying commercial vinyl.



There's now a further refinement to our successful musical formula where 'E' is pure musical enjoyment and 'MC' are our unique dual moving microcoils, set at 45° to the left and right in the same configuration as the original record cutter head.

The AT-F3 and AT-F5 are rapidly setting new standards in affordable analog listening with a specification that's ideally matched to the demands of modern audiophile turntables and tonearms. In addition, both models feature the latest advance in electrical systems... OCC internal wiring (Ohno Continuous Casting) which greatly enhances signal transfer.

Recent press comments on the F3 have included 'to go one better in all respects you would be looking for a great deal more' (HI-FI ANSWERS)... 'the AT-F3 remained perfectly in control separating and presenting the music's individual strands in a persuasive and believable way' (NEW HI-FI SOUND)... and on our F5... 'there was a transparency of texture and champagne like quality on transients, strings, brass and percussion' (GRAMOPHONE)... 'digs out detail better than many cartridges at twice the price' (HI-FI REVIEW)... 'the way the AT handles stereo is sure to become one of it's recognised hallmarks. It's brilliant.' (HI-FI ANSWERS).

Please contact us for a full information pack and call in soon for a personal audition at your specialist hi-fi store or local BADA dealer.

	AT-F3 OCC	AT-F5 OCC
Frequency response	15-50,000 Hz	15-50,000 Hz
Output voltage (1 kHz, 5 cm/sec)	0.25 mV	0.20 mV
Channel separation (1 kHz)	17 dB	21 dB
Channel balance	1.5 dB	1.5 dB
Recommended load	15 Ω	14 Ω
Load impedance	20 ohms	20 ohms
Rated impedance	200-200 Ω	200-200 Ω
Compliance	25 mm/s	25 mm/s
Stylus geometry	0.025 x 0.20 mm square shank/0.015 tip	0.07 x 0.20 mm square shank/0.015 tip
Vertical tracking error	23°	23°
Weight	8.0g	8.0g

The only complete transducer family

CARTRIDGE • HEADPHONE • MICROPHONE • VITAL LINKS



**audio-technica**

□ INNOVATION □ PRECISION □ INTEGRITY

Technica House, Lockwood Close, LEEDS LS11 5UU. Tel: 0632 771441

25 years in Hi-Fi

FOR THE BEST  
IN QUALITY  
HI-FI

**SWIFT** OF WILMSLOW

AR, AIWA, ARKAM, AUDIO LAB,  
B&W, CELESTION, DENON,  
HEYBROOK, INFINITY,  
KENWOOD, MARANTZ, MISSION,  
MONITOR AUDIO, MORDAUNT-  
SHORT, NAD, PHILIPS, PIONEER,  
QED, ROGERS, 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

BADABADABADABADA

Two overlapping circles

**sound advice**

THE MIDLANDS LEADING  
BRITISH EQUIPMENT SPECIALISTS,  
FOR OVER A DECADE

NAIM LINN MISSION ROYD  
A & R ROKSAN EPOS REGA MORDAUNT SHORT  
CREEK MONITOR AUDIO HEYBROOK CAMBRIDGE AUDIO  
MONITOR AUDIO NAKAMICHI YAMAHA  
REVOK ROTEL  
SENNHEISER

Callers welcome  
Demonstrations are by appointment

SOUND ADVICE, THE SOUND FACTORY, DUKE ST  
LOUGHBOROUGH LE11 1ED TELEPHONE 0509 218254  
SOUND ADVICE, 162 ALCESTER RD, MOSELEY  
BIRMINGHAM B13 8HS TELEPHONE 021 449 3328

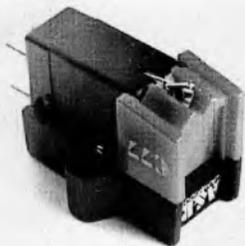
Established TEN YEARS  
East Midlands exclusive Rega agent

BADABADABADABADA

# A&R ARCAM C77Mg

A&R CAMBRIDGE LTD., DENNY END IND. CENTRE, WATERBEACH, CAMBRIDGE CB5 9PB. TEL: (0223) 861550.

BEST BUY



Derived from A&R's classic moving magnet series, the C77's Mg suffix denotes the use of a cast alloy (magnesium/aluminium/zinc) block to replace the compliant plastic carrier used on earlier models. Unfortunately, the detachable plastic stylus assembly will always remain a weak link in the overall scheme of things. A standard spherical profile C77 stylus is fitted, though the 30cu compliance will restrict the choice of partnering arm despite a paltry increase in the effective mass of just 0.3g.

## LAB REPORT

Requiring a 300-400pF load for an optimum HF response the C77Mg's output still dropped by 2.4dB at 6.5kHz before recovering at 20kHz to the nominal 0dB level. A rounded squarewave response was noted while some lateral misalignment increased the 2nd-order SMPTE IMD product to a massive 17.5 per cent – both influenced by the crude stylus profile. Tracking seemed fairly secure at

1.8g, but HF distortion would reach some 7.8 per cent with RIAA correction. VTA was also too high at 29 degrees, potentially influencing the resolution of L/R stereo images.

## SOUND QUALITY

Typically punchy and dynamic, this cartridge tended to emphasise the frequency extremes rather than any subtle tonal shadings contained within the midband. It was cleaner and better focused than the earlier C77, particularly at very high frequencies, these enjoying a greater freedom or acoustic 'air'. Nevertheless, with the spherical (conical) stylus profile majoring in second-order distortions, most recordings sounded smoother and slightly richer than expected – a positive feature in the context of a budget system. Stereo depth was also retrieved with some success, though the lateral separation was compromised slightly.

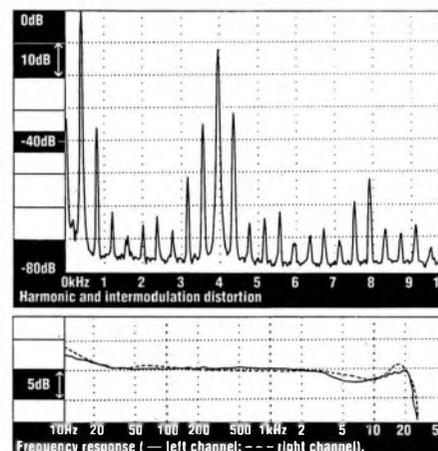
## CONCLUSIONS

A&R's rigid alloy mounting plate has subjectively spruced-up the C77 sound making it more enjoyable. A Best Buy is still in order for this classic amongst cartridges, the £10 premium being very reasonable.

## TEST RESULTS

Type, body mass	moving-magnet, 6.2g
Stylus type	Spherical, 15µm dia

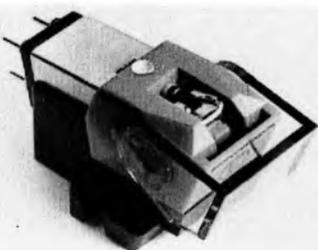
Compliance, vert/lat	30.1cu/23cu
Tracking Force Range/Test	1.6g-2.0g/1.8g
Tracking ability, L/R	>80µm/73µm
LF res., vert/lat	7Hz @ 13dB, 8Hz @ 15dB
Output at 1kHz, 5cm/sec, L/R	4.081/3.817mV
Separation, L/R	100Hz 1kHz 15kHz
	26.2/23.6 22.4/21.8 21.5/22.6dB
Channel balance	0.58dB
Coil resistance	435.6ohm
Vertical Tracking Angle	29 degrees
Loading Requirements	47kohm/300-400pF
Typical retail price	£30



# AUDIO TECHNICA AT-420E OCC

AUDIO TECHNICA LTD., TECHNICA HOUSE, LOCKWOOD CLOSE, LEEDS LS11 5UU. TEL: (0532) 771441.

RECOMMENDED



Distinguished by a dull orange stylus assembly, the AT-420E shares the same body as the cheaper AT-110E but benefits from a finer elliptical stylus profile and PC OCC copper wiring. The black plastic body includes a pair of open mounting lugs, although they do appear tough enough to accommodate standard Allen bolts. A trace of a damping material is applied to the crimped alloy cantilever but the cartridge's lateral resonance is still fairly strong. A symmetrical 14cu compliance makes it ideally suited to medium effective mass tonearms.

## LAB REPORT

Output is high at 4.3mV despite the low 400ohm coil resistance, indicating either a high moving mass or very efficient generator. Erring towards the former, the 0.7dB channel imbalance increased further at high frequencies, while an anomalous resonance was detected on the right channel at 37kHz. Separation steadied at a moderate 25-26dB

midband but worsened to around 19.6dB at 10kHz. Very sensitive to loading, a low parallel capacitance yielded the preferred down-tilting response (-3dB to -5dB at 20kHz) while values as high as 400pF resulted in a +1.4dB peak at 10kHz.

## SOUND QUALITY

This MM cartridge gave a smooth if slightly confused rendition of treble detail and offered a reasonably pleasant and balanced performance. Brush, without sounding unpleasantly bright, the AT-420E seemed better suited to punchy pop recordings than classical works. Bass lines were a little light but the cartridge was mercifully free of any thick or plummy colorations. Generally, it did not possess a particularly memorable character, but should be widely compatible.

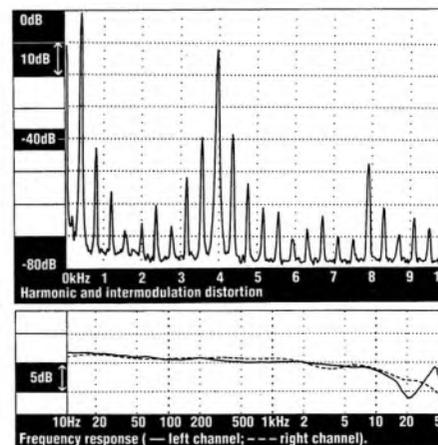
## CONCLUSIONS

This cartridge doesn't present any difficulty over arm matching, but care should be taken over the electrical loading if its optimum performance is to be realised. A cautious Recommendation seems most appropriate.

## TEST RESULTS

Type, body mass	moving-magnet, 7.2g
Stylus type	Biradial, elliptical, 300x700µm
Compliance, vert/lat	13.9cu/13.9cu
Tracking Force Range/Test	1.0g-2.0g/2.0g

Tracking ability, L/R	>80µm/79µm
LF res., vert/lat	10Hz @ 14dB, 10Hz @ 16dB
Output at 1kHz, 5cm/sec, L/R	4.266/3.933mV
Separation, L/R	100Hz 1kHz 15kHz
	26.2/24.6 21.5/24.6 28.8/26.9dB
Channel balance	0.71dB
Coil resistance	399.3ohm
Vertical Tracking Angle	22 degrees
Loading Requirements	47kohm/150pF
Typical retail price	£30



**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

**MISSION**  
ELECTRONICS

**Cyrus**  
by MISSION

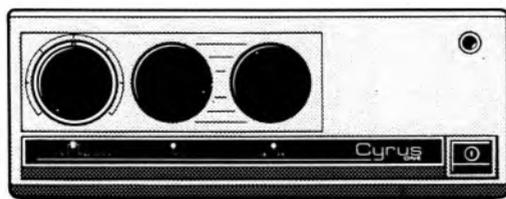
## MY FRIEND SAID THAT YOU'D SORT ME OUT

(IN THE NICEST POSSIBLE WAY!!)



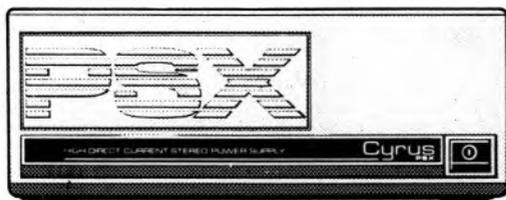
Most of our customers come to us on the recommendation of a friend. There are probably a number of reasons for this.

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.



<b>Cyrus I Amplifier</b>	<b>£179.90</b>
<b>Cyrus II Amplifier</b>	<b>£299.90</b>
<b>Cyrus PSX Power Supply</b>	<b>£199.90</b>
<b>PCM II CD Player</b>	<b>£599.90</b>
<b>Cyrus Tuner</b>	<b>£199.90</b>

**THIS SUPERB NEW RANGE WITH IMPROVED PERFORMANCE FACILITIES AND FINISH NOW ON DEMONSTRATION**

HIGH QUALITY HI-FI FROM:

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

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

Visit either of our superb showrooms and discuss your requirements with our enthusiastic and knowledgeable staff who will be pleased to tailor to suit **you**



**3 YEARS PARTS AND LABOUR GUARANTEE ON HI-FI SYSTEMS**

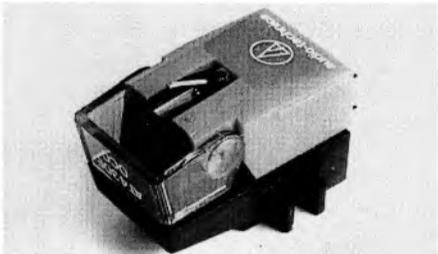
LICENCED CREDIT BROKERS - FULL FINANCE FACILITIES AVAILABLE - DETAILS ON REQUEST - APR 26.5%



**THE SPECIALISTS**

# AUDIO TECHNICA AT-430E OCC

AUDIO TECHNICA LTD., TECHNICA HOUSE, LOCKWOOD CLOSE, LEEDS LS11 5UU. TEL: (0532) 771441.



Based on the original 430 dual moving magnet cartridge, this version (like so many others in AT's current range) utilises PC OCC copper for the coil windings. However, mechanical integrity is less of a strong point as the metal body is sandwiched between a large, red plastic stylus assembly and black plastic mounting plate. A fairly discreet, extended-elliptical stone is mounted on the end of a rather long alloy cantilever but the system's compliance makes the cartridge most suitable for lower mass tonearms.

## LAB REPORT

A huge +1.4dB channel imbalance was detected at 1kHz though the channel separation was excellent at 31.33dB midband. VTA was spot on at 21 degrees, reducing any vertical distortions - HF distortion measured a low 0.28 per cent which is a tribute to the efficacy of this stylus profile. Interchannel matching was better throughout the treble than with the AT-420E, though the +2.2dB

rise at 10kHz is enough to add a subjective 'sting'.

## SOUND QUALITY

As predicted, the sound did err on the bright side of neutral, and the 430 also demonstrated an above average sensitivity to surface noise. An icy coloration tainted the resolution of percussive or brass instruments, which did tend to become uncomfortable over a period. However, a fair stab was made at retrieving deep and spacious ambient details, the sound clearly benefiting from a warm and full bass which, to some extent, redressed the harder, more forward presentation at higher frequencies.

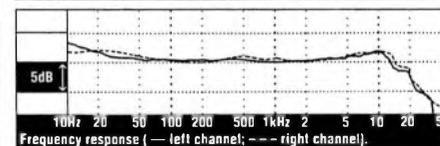
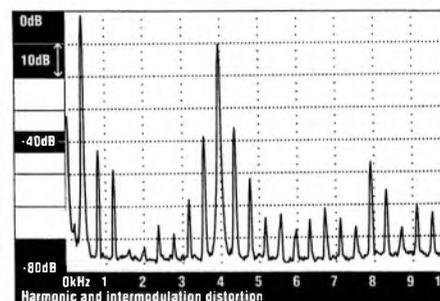
## CONCLUSIONS

Having tested an early sample of the AT-430E OCC some 15 months ago it's clear that while the compliance has been increased, little has been done to ameliorate either the channel imbalance or the aggressive frequency trend. As a result, the cartridge remains a dubious mixture of vices and virtues and so cannot be Recommended on a general basis.

## TEST RESULTS

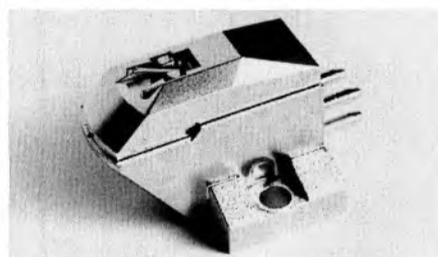
Type, body mass	moving-magnet, 6.2g
Stylus type	Bi-radial, elliptical, 200x700µm
Compliance, vert/lat	23cu/30.1cu
Tracking Force Range/Test	1.0g-1.8g/1.7g

Tracking ability, L/R	>80µm/>80µm
LF res., vert/lat	8Hz @ 12dB, 7Hz @ 15dB
Output at 1kHz, 5cm/sec, L/R	4.032/3.420mV
Separation, L/R	100Hz 1kHz 15kHz
	24.1/23.5 31.8/33.5 21.0/20.4dB
Channel balance	1.43dB
Coil resistance	593ohm
Vertical Tracking Angle	21 degrees
Loading Requirements	47kohm/150pf-250pf
Typical retail price	£42



# AUDIO TECHNICA AT-F3/OCC LE

AUDIO TECHNICA LTD., TECHNICA HOUSE, LOCKWOOD CLOSE, LEEDS LS11 5UU. TEL: (0532) 771441.



In celebration of Audio Technica's ten years of independent trading from its base in Leeds, anniversary or Limited Edition versions of the top MCs are now available. Any real technical differences between the gold-coloured LE F3 and 'standard' PCOCC F3 reviewed earlier are tenuous in the extreme, but the new model does look prettier. The cartridge's compliance is a little asymmetric but nonetheless ideally suited to a wide range of medium mass tonearms.

## LAB REPORT

Crosstalk was a trifle uneven across the audio spectrum, actually attaining an incredible 40.1dB at 5kHz on the right channel!

The output measured a sensible 0.34mV. VTA alignment was superb but a lateral error caused the 2nd-order SMPTE IMD product to reach a heady 16 per cent. The +2.5dB 'sting' at 12kHz was missing from our last AT-F3, as was the massive +7.2dB rise at 40kHz. This seems an odd result.

## SOUND QUALITY

It was clear that the characteristic 'fizz' of the original AT-F3 had returned, adding extra zest to all records without necessarily lapsing into a cold or unforgiving presentation. Indeed, the AT-F3 proved very tolerant of surface noise, musical transients rose up with an uncommon speed, while all percussive sequences possessed a crisp bite without tonal hardening. Bass was tight and rhythmic though on occasions perhaps lacking in vigour, the principal concern being with powerful female vocals where harmonics exacerbated the 12kHz 'sting' from time to time.

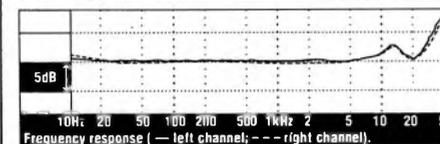
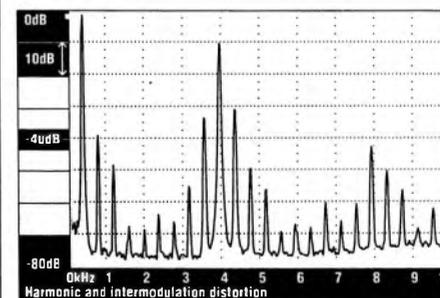
## CONCLUSIONS

Both technically and subjectively this so-called 'Limited Edition' AT-F3 bore a stronger resemblance to the original (LC OFC) F3 than its immediate forebear - could this indicate a degree of sample variation from the AT stable? Nevertheless, with its clean, fresh and wholly transparent perspective this cartridge comfortably trounces any other in this price sector.

## TEST RESULTS

Type, body mass	moving-coil, 5g
Stylus type	Bi-radial, elliptical, 200x700µm
Compliance, vert/lat	13.1cu/19.5cu
Tracking Force Range/Test	1.25g-1.75g/1.6g

Tracking ability, L/R	>80µm/>80µm
LF res., vert/lat	11Hz @ 9dB, 9Hz @ 15dB
Output at 1kHz, 5cm/sec, L/R	352.2/337.9µV
Separation, L/R	100Hz 1kHz 15kHz
	25.2/24.6 34.8/22.1 14.1/15.2dB
Channel balance	0.36dB
Coil resistance	11.89ohm
Vertical Tracking Angle	21 degrees
Loading Requirements	>20ohm
Typical retail price	£70



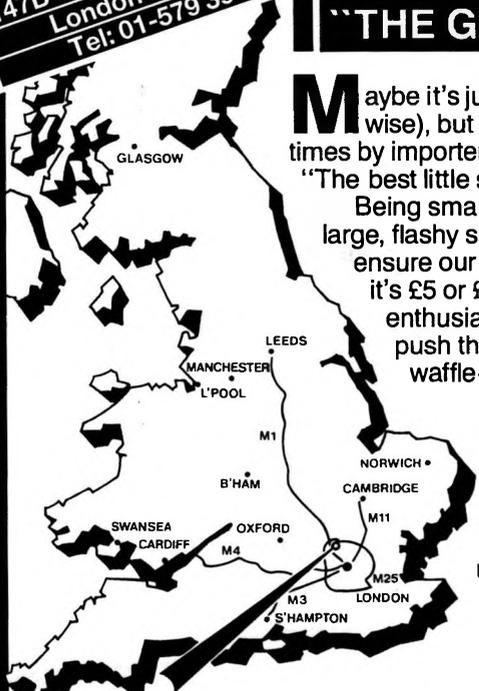
BEST BUY

**New Shop Open**  
**SOUNDS GOOD**  
 147B Uxbridge Rd., Ealing,  
 London W13 9AU.  
 Tel: 01-579 3963

# Radlett Audio

CONSULTANTS

"THE GREATEST LITTLE SHOP IN THE COUNTRY"



Maybe it's just an opinion (we're too modest to suggest otherwise), but during our 10 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. 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 • AUDIO RESEARCH • CROFT  
 • AUDIO INNOVATIONS • COUNTERPOINT • KOETSU • CREEK •  
 AUDIOLAB • VTL • VOYD • J.A. MICHELL • EPOS • KRELL • QUAD  
 • SNELL • SD ACOUSTICS • MAGNEPAN • ORACLE • ELITE •  
 PINK Δ • HEYBROOK • MUSICAL FIDELITY • SME • SPACE •  
 TANNOY • DENON • B+W • KEF • A+R • CAMBRIDGE • YAMAHA  
 • MONITOR AUDIO • EAR • CONCORDANT



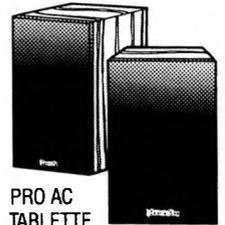
LINN LP 12



AUDIO RESEARCH D70



KOETSU RED



PRO AC  
TABLETTE

Radlett Audio Consultants  
 141 Watling Street, Radlett, Herts.  
**0923 856497**

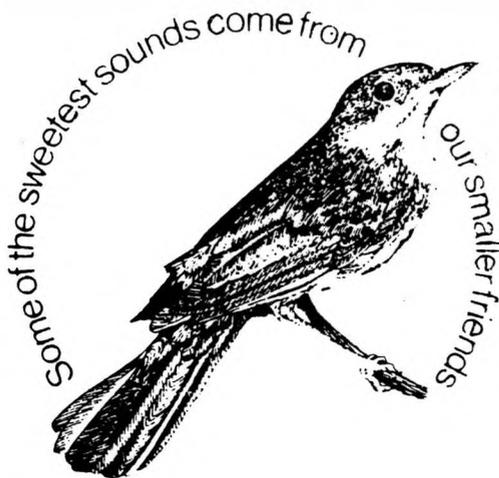
♪ ADVICE, SERVICE, MUSIC ♪

for

OVER 50 YEARS

from

Jeffries  
Hifi



Agents  
for:-

A & R CAMBRIDGE  
 AIWA  
 AUDIO RESEARCH  
 CELESTION  
 CREEK  
 DENON  
 DUAL  
 ELITE  
 EPOS  
 HEYBROOK  
 ION SYSTEMS  
 JPW  
 KEF  
 LINN  
 MAP  
 MERIDIAN  
 MISSION  
 MORDAUNT SHORT  
 MUSICAL FIDELITY  
 NAIM  
 QUAD  
 REGA  
 ROTEL  
 SENNHEISER  
 SONY ES  
 TANNOY  
 VAN DEN HUL  
 WHARFEDALE

4 ALBERT PARADE - GREEN STREET - EASTBOURNE - (0323) 31336  
 69 LONDON ROAD - BRIGHTON (0273) 609431

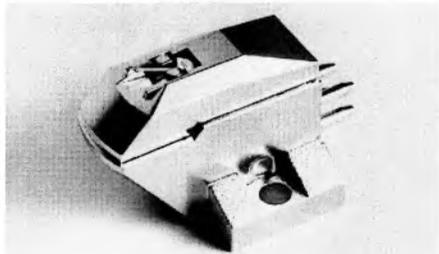
now with 3 separate demonstration rooms at each shop  
 CLOSED MONDAYS. LATE NIGHT WEDS - 8 p.m.



# AUDIO TECHNICA AT-F5/OCC LE

AUDIO TECHNICA LTD., TECHNICA HOUSE, LOCKWOOD CLOSE, LEEDS, LS11 5UU. TEL: (0532) 771441.

BEST BUY



Now re-packaged as the 'Anniversary' AT-F5 this cartridge is less easily distinguished from the cheaper AT-F3 – look for the white AT logo on the front face. Structurally, the cartridge appears identical; it features a broad alloy mounting plate, V-shaped coils in the generator, a rigid but very lightweight beryllium cantilever and exquisitely finished elliptical tip. Its compliance is a little higher than the AT-F3 so fractionally lower mass tonearms are preferred. However, the sub-sonic resonance is better damped in the F5 so compatibility should not pose any real problems.

## LAB REPORT

Once again, a very bumpy crosstalk spectrum (max sep. of 41.5dB at 7.4kHz) contrasted with a remarkably flat and even frequency response. For some reason tracking was poor on the right channel, requiring more bias than expected. VTA, THD and HF distortions were all appropriately low but (as the plot

demonstrates), 2nd-order IMD was unusually high.

## SOUND QUALITY

Sharing the quietly spacious, dark acoustic generated by the cheaper F3, the latest AT-F5 was also moderately smoother and sweeter into the bargain. If the previous AT-F5/OCC required a smidgen of extra 'sparkle' then this LE version would seem to have redressed the situation, as it was clearly the most neutral and natural sounding cartridge in this test. In common with far costlier MCs it possessed a most beguiling fluidity, a seamlessness and tonal integration that stretched from the upper bass to the far treble without audible discontinuity.

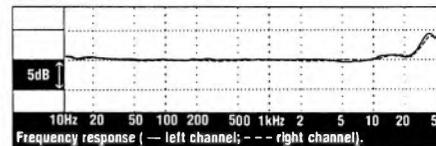
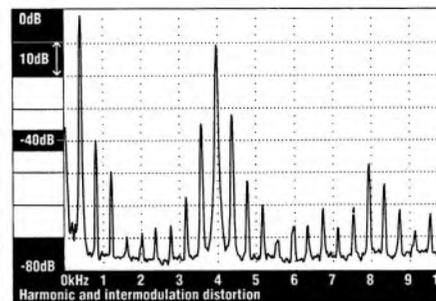
## CONCLUSIONS

£100 is still a heady price to pay for such a seemingly insignificant piece of equipment, yet perceived value aside the AT-F5/OCC LE represents a particularly wise investment. Some reservations about the tracking prowess of this cartridge exist but assuming this was something of a rogue sample the Best Buy rating will still apply to 99 per cent of available AT-F5s!

## TEST RESULTS

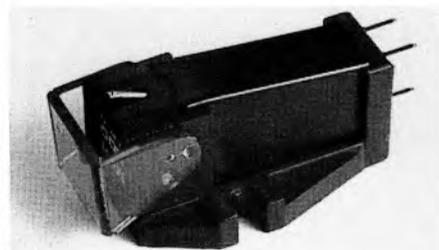
Type, body mass moving-coil, 5g  
Stylus type Extended elliptical, 70x140µm

Compliance, vert/lat	19.5cu/19.5cu
Tracking Force Range/Test	1.25g-1.75g/1.6g
Tracking ability, L/R	>80µm/68µm
LF res., vert/lat	9Hz @ 8dB, 9Hz @ 13dB
Output at 1kHz, 5cm/sec, L/R	355.8/327.7µV
Separation, L/R	100Hz 24.5/26.0    1kHz 34.3/38.4    15kHz 19.5/21.9dB
Channel balance	0.71dB
Coil resistance	11.34ohm
Vertical Tracking Angle	22 degrees
Loading Requirements	>100ohm
Typical retail price	£100



# EMPIRE 800MKII

AUDIOFREAKS, 15 LINK WAY, HAM, SURREY TW10 7QT. TEL: (01) 948 4153.



The 800MKII is clearly based on Ortofon's highly successful VMS series of cartridges, and appears to be most closely allied to the stalwart VMS10E11. The tubular alloy cantilever is fitted with an elliptical stylus at one end and a permeable armature at the other. This moves between coils set in the field of a permanent ring magnet – hence the term Variable Magnetic Shunt. The resulting output is extremely high at 6.5mV (5cm/sec peak) and so will drive any standard moving magnet input.

## LAB REPORT

As expected from an Ortofon design, THD was suitably low and the VTA spot-on at 21 degrees. A lateral misalignment persisted though, resulting in 2nd-order SMPTE IMD attaining some 15.1 per cent. Furthermore, a 4-7dB asymmetry was seen between the L/R channel crosstalk spectra. With 100-200pF loading, the response peaked at 3kHz (+0.8dB) and 20kHz (+3dB) so a higher

parallel capacitance is needed in order to achieve a reasonably flat response (as published).

## SOUND QUALITY

The initial impressions of a generally pleasant but slightly lean balance soon deteriorated as the 800MKII reproduced music with an almost superficial regard – essentially accurate but lacking in body and conviction. Tonal integration was very good but this seamlessness simply allowed individual instruments to slide over one another, their distinctions blurred and images soft and lazy. There was a further loss of control near the end of side, where a pinched quality affected strong female vocals.

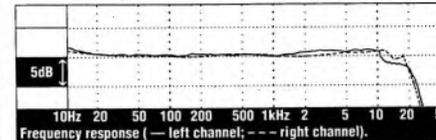
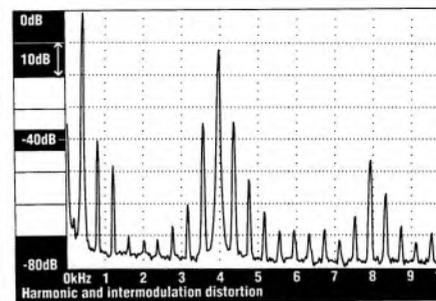
## CONCLUSIONS

At some point the Empire 800II has lost its spark of vitality, and a universal blandness seemed to pervade the acoustic of most recordings. The sound is safe enough but simply failed to illicit any real emotional enthusiasm which is an unfortunate result, considering its broad electrical and mechanical compatibility.

## TEST RESULTS

Type, body mass moving-magnet, 5g  
Stylus type Nude elliptical  
Compliance, vert/lat 13.1cu/19.5cu

Tracking Force Range/Test	1.7g-2.3g/2.0g
Tracking ability, L/R	>80µm/79µm
LF res., vert/lat	11Hz @ 8dB, 9Hz @ 13dB
Output at 1kHz, 5cm/sec, L/R	6.804/6.227mV
Separation, L/R	100Hz 28.1/22.6    1kHz 30.1/23.7    15kHz 28.6/24.7dB
Channel balance	0.77dB
Coil resistance	818ohm
Vertical Tracking Angle	21 degrees
Loading Requirements	47kohm/300-400pF
Typical retail price	£33



# The Audio File

## New Year's Fayre

### Entree

JBL JUICE	MISSION MOUSSE
LINN LANGOUSTINES	MARANTZ MELON
DEVILLED DENON	ROKSAN RAMEKINS
PRO-AC PATE	KEF KEBABS

### Main Course

ENTRECOTE EXPOSURE	GRILLED GALE
CAMBRIDGE AUDIO CURRY	B&W BOUGUIGNONNE
GOODMANS GOULASH	REGA RISOTTO
SONY STROGANOFF	SIZZLING SENNHEISER
BRAISED BEYER	MINCED MONITOR AUDIO
QUAILED QUAD	TANDOORI TANNOY
ROTEL RATATOUILLE	CREAMED CREEK
QUICHE QED	DUAL DUMPLINGS
CRISPY CELEF	HEYBROOK HAKE
RUARK RISsoles	FOUNDATION FLAMBE

### Dessert

NAKAMICHI NOISETTE	ICED INCA TECH
APPLE ARISTON	NEAPOLITAN NAIM
ARCAM ALASKA	WHARFEDALE WAFFLES
CITRUS CYRUS	YAMAHA YOGHURT

FRESH COFFEE WITH  
ACOUSTIC ENERGYS



SERVICE CHARGE OF 0%  
ON ALL MEALS



The Audio File  
HI-FI Dealer  
of the year  
1988

AUDIO FILE, HI-FI MEAL OF THE  
YEAR 1988

27a & 40 HOCKERILL ST.,  
BISHOPS STORTFORD, HERTS.  
TEL: (0279) 506576



...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, Beyer, Decca, Denon,  
Foundations, Goldring, Hellus, Jecklin-Float, JPW, JBL, Marantz,  
Nagaoka, Nakamichi, Ortofon, Pink Triangle, Pirates, QED, Revox,  
Rotel, The Rock, Sennheiser, Snell, Sony, Sugden, Suma, Supra,  
Systemdek, Torlyte Platforms, Target, Valdi, Voyd.

## Audio South

"Professional record cleaning service now available"  
Ex-Demonstration and Second Hand equipment available -  
ing for details

5 Mead Lane, Farnham, Surrey GU9 7DY  
Tel: (0252) 714555



Open Monday to Saturday 10-6 pm  
Demonstrations by Appointment



# Aylesbury Hi-Fidelity



The real Hi-Fi specialists in Buckinghamshire

MONITOR AUDIO R852 MDs  
R352MD/R300MD  
NOW IN STOCK  
CAMBRIDGE P40/CD2  
DISC PLAYER IN STOCK  
MARANTZ  
CD65MK11 SE  
CD94 IN STOCK  
AR EB101  
ON STOCK  
DUAL CS 503-1  
IN STOCK  
MOTH ARM  
IN STOCK

1/3 down  
Balance over  
six months  
Personal callers  
Subject to Status

**0% CREDIT**

MICHELL  
GYRODECK  
ON DEM  
EXPOSURE IN  
STOCK  
AUDIO TECHNICA  
ATF3/ATF5/OC7/  
OC9 IN STOCK  
SYSTEMDEK IIX  
IN STOCK  
ARISTON  
0' DECK STOCKED  
MANTICORE  
MANTRA IN  
STOCK  
ALPHASON  
ZENON  
IN STOCK

7 Day Exchange  
Part Exchange  
Home demonstrations  
Service Facilities  
Expert Installations

Mail Order  
Available  
Export Services:  
Turntable set up  
facility



Alwa, AKG, Alphason, Audio Technica (CD Players also), ADC, AR A&R, Beard,  
Boston, BLO, Castle, Celestion, Celestion, Denon, Dieris, Dual, Exposure, Gale, Goldring,  
Goldring, Grado, Gyrodek, Heybrook, Harmon, Kardon, KFF, Logic, Linn Arms, Monitor,  
Audio, Michell, Magnum, Mantra, Musical Fidelity, Meridian, Mission, Mordant,  
Short, Marantz, Monster, Myst, Nakamichi, Nagaoka, NVA, NAD, Ortofon, Paragon,  
Philips (CD only), P.S. Audio, Proac, Proton, Quad, QED, Rata, Rotel, Revox, Revolver,  
Rogers, Sennheiser, Something Solid, Sordex, Stand & Deliver, Spendor, Systemdek,  
Tannoy, Target, Teac CD, Thorens, Trio CD, Walker, Wharfedale, Yamaha, Zeta



98 Cambridge Street, Aylesbury, Bucks

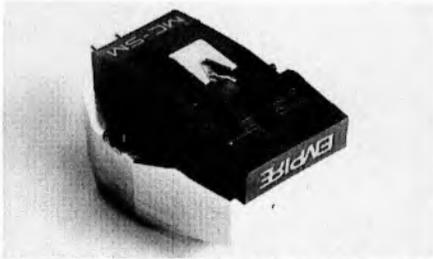
HI-FI MARKETS (0296) 28790

TOP TAPE

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

# EMPIRE MC-5M

AUDIOFREAKS, 15 LINK WAY, HAM, SURREY TW10 7QT. TEL: (01) 948 4153.



Now imported through Audiofreaks (after a short spell with Automation Sciences) the low-output *MC-5M* has been given a new lease of life. This chunky black and gold cartridge appears to use the same yokeless generator assembly as the Glanz cartridges, four gold-anodised magnets forming a mutually perpendicular 'V' above the detachable moving-coil assembly. However, Empire has discarded the ineffectual plastic carrier as fitted to the Glanz cartridges and replaced it with a light, alloy mounting block complete with fully enclosed lugs. Empire also supplies a set of miniature step-up transformers (cf. Ortofon *T-5*) and brass mounting hardware in the presentation case.

## LAB REPORT

Better suited to medium/high mass tonearms, the *MC-5M* offered a 0.43mV output, together with a remarkably flat and extended frequency response – in fact within 0.5dB tolerance to 50kHz! Compliance was a

little asymmetric at 6.5/14.7cus, as was the stereo separation (29.9dB/22.7dB at 1kHz). Tracking was not so hot either with the cartridge failing the 70µm band on the right channel.

## SOUND QUALITY

Compared to the related Glanz cartridges the *MC-5M* was certainly tighter and more dynamic. The balance erred on the warm side throughout the lower mid but it still enjoyed plenty of energy and sparkle across the treble. Vocals were not projected too forcibly but the stereo image was convincingly tactile, bathing in a slightly soft but pleasantly broad and deep acoustic. However, unless the stylus guard was removed a slightly vague, boxy coloration persisted.

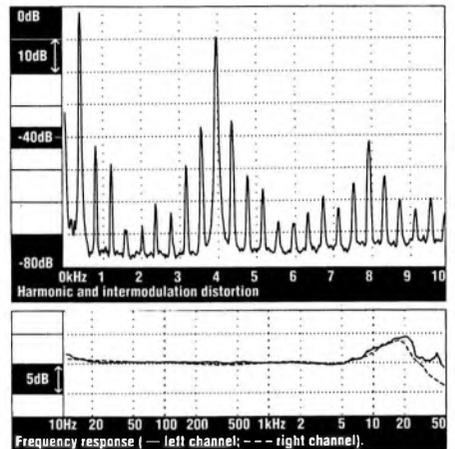
## CONCLUSIONS

Extra care in the Empire's *MC-5M*'s construction has clearly paid off, for it afforded a leap in detail resolution over the Glanz cartridges. However, the £100+ price tag works against the competitiveness of this cartridge, earning it a 'try-before-you-buy' Recommendation.

## TEST RESULTS

Type, body mass	moving-coil, 6.2g
Stylus type	Square parilinear, 5µm x 45µm
Compliance, vert/lat	6.5cu, 14.7cu

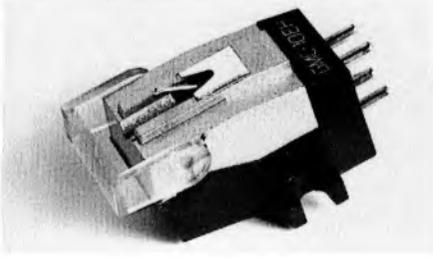
Tracking Force Range/Test	1.6g-2.0g/1.8g
Tracking ability, L/R	77µm/66µm
LF res., vert/lat	15Hz @ 9dB, 10Hz @ 13dB
Output at 1kHz, 5cm/sec, L/R	453.4/416.2µV
Separation, L/R	100Hz 26.5/23.1    1kHz 29.9/22.7    15kHz 25.7/23.8dB
Channel balance	0.74dB
Coil resistance	23.1ohm
Vertical Tracking Angle	30 degrees
Loading Requirements	40-100ohm
Typical retail price	£110



RECOMMENDED

# GLANZ GMC-10EH

PRESENCE AUDIO, THE OLD POST HOUSE, PLUMMERS PLAIN, HORSHAM, W. SUSSEX. TEL: (0403) 76777.



Glanz is better known for its moving-flux cartridges, so this high-output moving coil is something of a departure. The body and stylus assembly are a lightweight plastic, but any remaining hint of rigidity is thwarted by the open mounting lugs. A long alloy cantilever features a standard elliptical diamond, while beneath the detachable stylus assembly lie two pairs of mutually perpendicular and yokeless SaCo magnets. Despite the low 129ohm coil resistance, this powerful generator still produces 2.5mV (at 5cm/sec peak), sufficient for most normal MM inputs.

## LAB REPORT

Lateral and vertical compliances were wildly different, but the *GMC-10LX* is still best suited to medium effective mass tonearms. The crosstalk spectrum was also rather erratic, reaching a maximum of 28.7dB at 4.6kHz; an average figure of 23-24dB would be more appropriate in the midband. The cartridge is insensitive to loading and suffered a strong

HF rise of +4.9dB at 20kHz, though surface noise proved more troublesome than any treble 'sting'. Tracking was secure at 2.0g, offering good -36.8dB squarewave linearity and HF distortion of just 0.22 per cent (with-out equalisation).

## SOUND QUALITY

Almost in defiance of the startling HF response trend the *GMC-10EH* refused to sound overtly bright. In fact it was liked for its inherent smoothness – perhaps slightly wispy but tonally very even. Vocal projection seemed slightly reticent but stereo images were integrated into a very approachable, inoffensive bundle. A little extra weight was needed at low frequencies to add more authority, but at least the *GMC-10EH* was sufficiently convincing to capture the listener's attention.

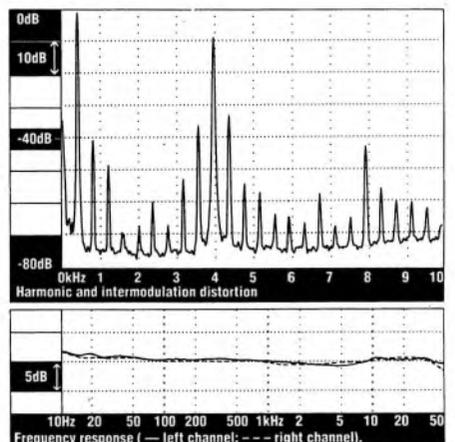
## CONCLUSIONS

This is a lightweight performer that would undoubtedly benefit from a structural rebuild. However, it offered a smooth 'MC sound' without the penalty of a low output. In all, the performance was quite sufficient to warrant a cautious Recommendation.

## TEST RESULTS

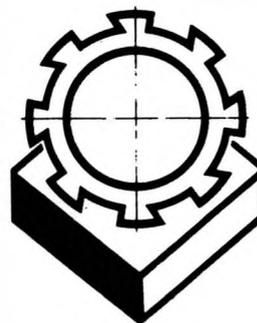
Type, body mass	high o/p moving-coil, 4.2g
Stylus type	Elliptical

Compliance, vert/lat	16.7cu/34cu
Tracking Force Range/Test	1.7g-2.3g/2.0g
Tracking ability, L/R	>80µm/>80µm
LF res., vert/lat	10Hz @ 8dB, 7Hz @ 12dB
Output at 1kHz, 5cm/sec, L/R	2.526/2.421mV
Separation, L/R	100Hz 26.5/22.7    1kHz 26.2/24.9    15kHz 21.9/20.5dB
Channel balance	0.37dB
Coil resistance	128.9ohm
Vertical Tracking Angle	26 degrees
Loading Requirements	<10kohm
Typical retail price	£49



RECOMMENDED

# THE BEST!



HEAR THE ROKSAN WITH THE NEW ARTEMIZ TONEARM  
A NEW REFERENCE



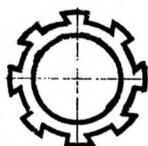
**Moorgate Acoustics Ltd.**

184 Fitzwilliam Street,  
Sheffield  
(0742) 756048

2 Westgate  
Rotherham  
(0709) 370666

Stockists of Quality Hi-Fi – including – KRELL, MAGNAPLANAR, SUMO,  
MISSION CYRUS, MUSICAL FIDELITY, ALISON, DENON, ROGERS,  
EXPOSURE, YAMAHA, MERIDIAN, CAMBRIDGE, ROTEL, NAD, etc.

**1st choice in East Anglia  
for Quality hi-fi . . .**



*By Roksan*



QUAD

SME

ROGERS	AUDIOLAB
ROYD	MICHELL GYRODEC
QUAD	PINK TRIANGLE
GALE	MISSION
ROKSAN	FOUNDATION
NAD	SENNHEISER
DUAL	SYSTEMDEK
DENON	EXPOSURE
TDL	VAN DEN HUL
A&R	SONY ES
LINX	GOLDRING
SME	TANNOY
ROTEL	AUDIO-TECHNICA
ONKYO	CELESTION
QED	BEARD
AR	MARANTZ
MOTH	SOUND ORGANISATION

- OPEN 9am to 6pm  
MONDAY TO SATURDAY  
(or by appointment)
- PROFESSIONAL INSTALLATIONS

- FULL DEMONSTRATION  
FACILITIES AVAILABLE
- FREE CUSTOMER  
CAR PARK OUTSIDE

**Lyon Audio**   
Hi-Fi Sound & Design Specialists

16 PEARTREE BUSINESS CENTRE  
PEARTREE ROAD, STANWAY, ESSEX  
Tel: COLCHESTER (0206) 560259

Credit Arranged – details on request



## PROGRESSIVE AUDIO

HOME DEMONSTRATION SPECIALISTS

**We give you six of the best!**

Systemdek IIX/Scorpio/Goldring 1010  
Sugden A25 + JPW P1

Rock/Excalibur/ATF-5

Kelvin Labs Junior Pre/Power  
Proac Super Tablettes

Valdi/Kuzma/Goldring Eroica

Audio Innovations Series 500 + Snell Type JII

Kuzma Stabi/Kuzma Stogi/OC-7

Kelvin Labs MC1/M30 + Proac Mini Towers

Michell Gyrodek/SME IV/Koetsu

Kelvin MC1/M60 + Proac EBS

Voyd/Cyalene/Audio Note

Audio Innovations 1000/2nd Audio Triodes  
Snell Type C

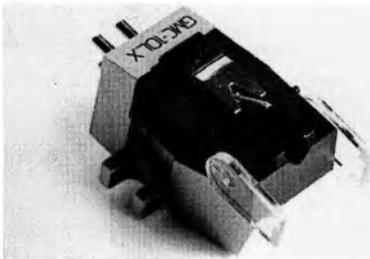
**A lesson in music!**

FOR A FIRST CLASS NO OBLIGATION HOME DEMONSTRATION OF ANY OF  
THE ABOVE SYSTEMS OR OF THE SUPERB EQUIPMENT LISTED BELOW:  
MICHELL VOYD SYSTEMDEK ROCK REGA EXCALIBUR HELIUS SME  
KUZMA KOETSU DECCA ORTOFON MILLTEK AUDIO TECHNICA GOLDRING  
AUDIO NOTE ALBARRY AUDIO INNOVATIONS SUGDEN EDISON QUICKSILVER  
INCA TECH MYST KELVIN LABS AUDION PROAC SNELL SPICA JPW  
NEW ARRIVALS: Marantz CD Players, Kimber Cable, Torlyte Platforms

**PHONE: (0634) 389004 or (0634) 366216**

# GLANZ GMC-10LX

PRESENCE AUDIO, THE OLD POST HOUSE, PLUMMERS PLAIN, HORSHAM, W. SUSSEX. TEL: (0403) 76777.



The *GMC-10LX* moving coil appears to share the same internal magnet assembly as the cheaper *GMC-10EH*, but far fewer turns on the armature places it firmly in the low-output class. Transient response should be improved by reducing the moving mass in this fashion, just as the fine line contact stylus bodes well for accurate groove tracing. Light to medium effective mass arms are best suited to this cartridge but, once again, the structural limitations of its plastic body cannot easily be overcome.

## LAB REPORT

VTA was wildly inaccurate, resulting in an extra 6.4 per cent vertical distortion. By contrast the squarewave linearity was excellent at -43.6dB as was the HF distortion residual of just 0.24 per cent. The crosstalk spectra were rather asymmetric, not only in the 10dB error between channels but also with respect to frequency. Separation fell to 21.4dB at 6.3kHz but improved either side of this point,

while additional resonances produced 'spikes' at 23kHz and 37.2kHz. Consequently, the 20-20kHz response may have been admirably flat but there was a +2.3dB increase in ultrasonic output.

## SOUND QUALITY

In many respects the *10LX* bore a similar signature to the higher output *10EH*, although in this instance the treble sounded that much more 'jangly'. A faint haze pervaded through most recordings, this cartridge lacking the crispness and stereo focus expected at the price. Deep bass notes were also restricted in extension and impact, for instance, lending a slightly insubstantial feel to large scale orchestral works.

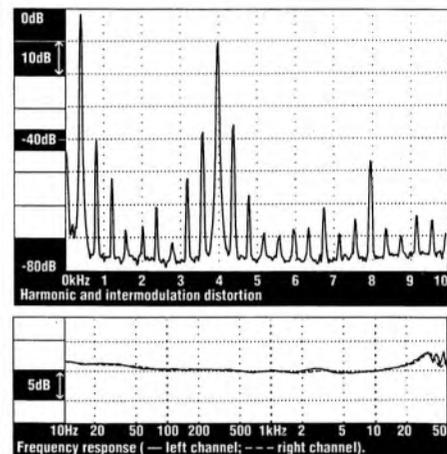
## CONCLUSIONS

In some areas of technical performance - channel balance, squarewave linearity and HF distortion - the *GMC-10LX* excelled itself. By contrast the stylus polish, tracking margins and symmetry of separation were a trifle weak. Subjectively too, this cartridge simply failed to hang together in a cohesive fashion, but perhaps other samples will be better balanced in terms of overall performance.

## TEST RESULTS

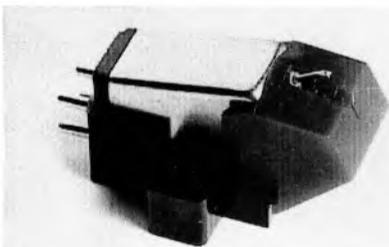
Type, body mass	Moving-coil, 4.8g
Stylus type	Line Contact

Compliance, vert/lat	16cu/19.8cu
Tracking Force Range/Test	1.7g-2.3g/2.0g
Tracking ability, L/R	76µm/71µm
LF res., vert/lat	10Hz @ 13dB, 9Hz @ 11dB
Output at 1kHz, 5cm/sec, L/R	466.4/466.1µV
Separation, L/R	100Hz 1kHz 15kHz
	28.5/15.6 30.3/17.4 25.2/18.5dB
Channel balance	0.0dB
Coil resistance	18.30ohm
Vertical Tracking Angle	32 degrees
Loading Requirements	>100ohm
Typical retail price	£79



# GOLDRING ELAN

GOLDRING PRODUCTS LTD., 8 GREYFRIARS ROAD, BURY ST. EDMUNDS, SUFFOLK IP32 7DX. TEL: (0284) 701101.



A new addition to the budget category, this moving magnet cartridge bears a striking resemblance to the ultra-budget Nagaoka *MM4*, reviewed in our last cartridge issue. An alloy body can is surmounted by an ABS plastic carrier and though this is not an ideal arrangement Goldring has at least damped the internal mechanism with various epoxy adhesives. A standard spherical stylus is fitted (as A&R *C77*), while the low 4.2g body-weight and sensible 16.7cu compliance pitch it squarely at middle mass tonearms.

## LAB REPORT

Channel separation was a little asymmetric but it reached a maximum of 41.5dB at 6.5kHz, almost too good to credit at this price! Similarly, the frequency response (measured with 380pF total parallel capacitance) was remarkably even, despite an interchannel discrepancy of 1.13dB. On the debit side both 2nd and 3rd order non-linearities were very high; the SMPTE IMD

reached a gargantuan 19.9 per cent. While employing RIAA correction the pulsed HF test yielded a 270Hz product at 12.4 per cent. Tracking was secure at 2.0g but these forms of distortion are largely determined by stylus profile.

## SOUND QUALITY

Sounding very much like the cheaper Nagaoka, the *Elan* gave a punchy and forthright sound without being overly critical of vinyl surface noise. Vocals were projected with great enthusiasm but female performers, in particular, were compromised by an occasional acerbic sibilance. Light of foot, the *Elan* maintained a fair sense of rhythm even though energy at low frequencies was diluted, lacking the solidity and bone-moving bass generated by superior (costlier) cartridges.

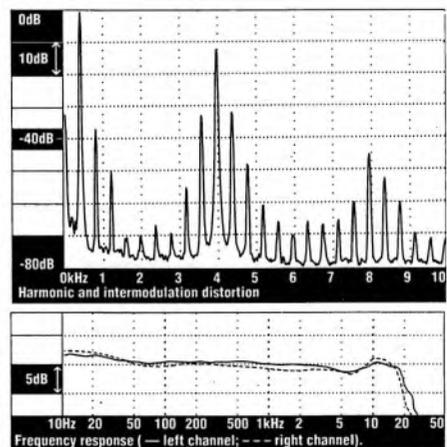
## CONCLUSIONS

The exact differences between the *Elan* and Nagaoka *MM4* remain unclear, but as a lean and punchy-sounding cartridge it should be treated as a foil for the likes of the *Revolver* and budget AT cartridges. A good starter model and Recommended.

## TEST RESULTS

Type, body mass	Moving-magnet, 4.2g
Stylus type	Spherical, 15µm x 600µm

Compliance, vert/lat	16.7cu/16.7cu
Tracking Force Range/Test	1.5g-3.0g/2.0g
Tracking ability, L/R	>80µm/>80µm
LF res., vert/lat	10Hz @ 11dB, 10Hz @ 13dB
Output at 1kHz, 5cm/sec, L/R	4.152/3.645mV
Separation, L/R	100Hz 1kHz 15kHz
	27.2/29.1 21.6/25.8 18.5/20.6dB
Channel balance	1.13dB
Coil resistance	749.5ohm
Vertical Tracking Angle	28 degrees
Loading Requirements	47kohm/150-400pF
Typical retail price	£15



RECOMMENDED



**WIN!**  
YAMAHA CDX 71  
COMPACT DISC PLAYER  
To be won every day  
in the FREE PRIZE  
DRAW

**at the Holiday Inn, Bristol**  
FRIDAY 17th FEBRUARY 12am-8pm  
SATURDAY 18th FEBRUARY 10am-6pm  
SUNDAY 19th FEBRUARY 10am-6pm

Organised by  
ABSOLUTE SOUND  
& VIDEO  
OXFORD · SWINDON ·  
CHELTENHAM · BATH ·  
BASINGSTOKE  
AUDIO EXCELLENCE  
CARDIFF · SWANSEA ·  
GLOUCESTER  
RADFORD HI-FI  
EXETER · BRISTOL ·  
WINDSOR · BATH

ADMISSION  
£2.00

(includes entry in  
prize draw  
accompanied children  
under 14 FREE)

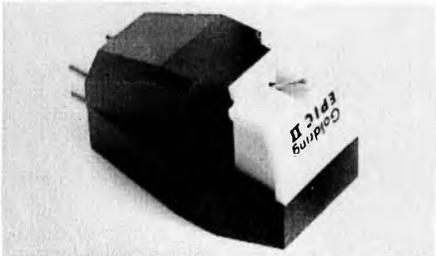
in association  
with,  
WHAT HI-FI  
NEW HI-FI  
SOUND  
HI-FI ANSWERS

- A&R
- AKG
- Absolute Sounds
- Acoustic Research
- Alwa
- Allison
- Audio Innovations
- Audiolab
- Audio Technica
- Beyer
- Cambridge Audio
- Celestion
- CD Distribution
- Chora
- DW Labs
- Foundation
- Goodmans
- Harman
- Hayden Audio
- Haymarket Publishing
- JVC
- Kenwood
- Hi-Fi Choice
- Hi-Fi News
- Hi-Fi Review
- Howland West
- IPW
- Meridian
- Linn Products
- Marantz
- Marcel Audio
- Martin Leighfield
- Maxell
- Mission
- Monitor Audio
- Mordaunt-Short
- Musical Fidelity
- NAD
- Orleyo
- Revox
- Sony ES
- Panasonic
- Path
- Phillips
- Portfolio
- Revolver
- Rotel
- Sony
- TDK
- Sansui
- SD Acoustics
- SME
- Target Audio
- Technics
- Tannoy
- Van den Hul
- Veda
- Yamaha
- Whick Compact Disc

THE WIDEST RANGE OF HI-FI PRODUCTS ● MEET AND TALK TO THE MAJOR MANUFACTURERS AND THE PEOPLE FROM THE MAGAZINES  
● MAJOR DEMONSTRATIONS OF NEW AND FAVOURITE PRODUCTS INCLUDING PHILIPS C.D.V. ● EASY PARKING NEAR HOTEL

# GOLDRING EPIC MkII

GOLDRING PRODUCTS LTD., 8 GREYFRIARS ROAD, BURY ST. EDMUNDS, SUFFOLK IP32 7DX. TEL: (0284) 701101.



Recent modifications to the established Goldring *Epic* cartridge have resulted in the launch of a MkII version. Principally, the stylus assembly is now a two-part affair offering a reduced tip mass of 0.6mg, a higher compliance and reduced mechanical damping. This new assembly, together with the bulky Pocan body, make for a firm bond between the headshell and enclosed mounting plate. Apart from the inclusion of higher quality copper wire, little or no changes have been effected to the internal generator so 'highish' parallel capacitor loads (400pF) will still yield the optimum treble response.

## LAB REPORT

Goldring has improved the frequency extension of this cartridge despite a -3.5dB sag between 4kHz-12kHz. Compliance was asymmetric as was the midband L/R separation but at least the channel balance was maintained to a tight 0.1dB tolerance. Geometric distortion was high though, both through the

excessive 32 degree VTA (5.8 per cent) and lateral misalignment (2nd-order SMPTE of 11.6 per cent). HF distortion would reach 11.8 per cent after RIAA equalisation, while on the tracking test neither channel surmounted the 80µm band.

## SOUND QUALITY

Compared to an older sample of the *Epic*, this *MkII* version was more frisky and detailed. An attenuation at high frequencies was still apparent but the balance was less laboured than before - a plodding bass line traded for a warm but breezy character. Similarly, the midband was very approachable if not as transparent nor as sharply etched as is possible. It covered its tracks cleverly, disguising those worst areas of its performance with a smooth and mellow euphony.

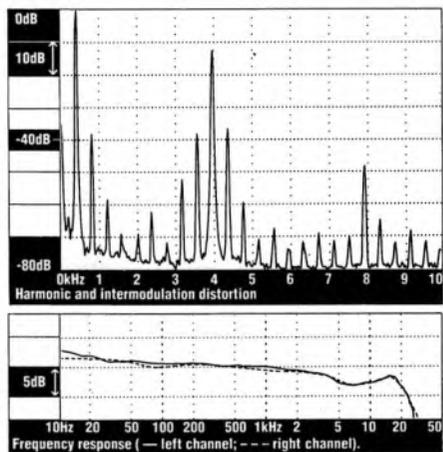
## CONCLUSIONS

Goldring has successfully built on the qualities of the older *Epic*, the new stylus assembly making for a more fluid sound quality. It's still ideally suited to the light and bright budget systems - and Goldring must address the vertical and HF distortions in order to realise the full clarity of modern records.

## TEST RESULTS

Type, body mass Moving-magnet, 7.0g  
Stylus type Nude elliptical, 18µm x 7µm

Compliance, vert/lat	17.4cu/28.7cu		
Tracking Force Range/Test	1.3g-2.3g/1.8g		
Tracking ability, L/R	76µm/69µm		
LF res., vert/lat	9Hz @ 11dB, 7Hz @ 14dB		
Output at 1kHz, 5cm/sec, L/R	4.109/4.057mV		
Separation, L/R	100Hz	1kHz	15kHz
	28.5/27.9	19.4/26.9	17.4/23.7dB
	Channel balance 0.11dB		
Coil resistance	696.7ohm		
Vertical Tracking Angle	32 degrees		
Loading Requirements	47kohm/200-400pF		
Typical retail price	£23		



RECOMMENDED

# LINN K5

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



The *K5* is cheapest of Linn's K-series and appears to adopt the dual-magnet generator system used by Audio Technica in its cheaper MM cartridges. Indeed, both the elliptical stylus, crimped alloy cantilever and compliant damper are very similar to those employed in the *AT-420E*. Nevertheless, because of the *K5*'s lower bodyweight, its mean 14cu compliance makes it better suited to medium mass tonearms.

A superior plastic stylus housing is used for the *K5* complementing the grey material used for the top mounting plate. Fully enclosed lugs and a set of non-magnetic steel bolts ensure a firm mate with the headshell.

## LAB REPORT

Increasing the load capacitance (200 to 400pF) tended to bolster output around 10kHz at the expense of more significant loss around 20kHz. The channel imbalance of 1.2dB worsened above 2kHz though the overall response trend proved reasonably even. A

fundamental tip resonance coincided with a massive reduction in separation (12.7dB at 18.1kHz), though the *K5* typically offered 22-26dB throughout the midband - well within its 20dB specification. Second-order SMPTE IMD was high at 13.6 per cent but the fine VTA and 0.64 per cent HF distortion (without equalisation) bode well for lateral stability.

## SOUND QUALITY

Lacking the detail resolution and dynamic prowess of the *K9*, the *K5* sounded smoother but somehow less involving and articulate. While avoiding bright or coarse high frequency colorations, percussive instruments simply lacked the edge and crispness normally expected. In its favour the *K5* did project a warm and approachable midband with 'big' if slightly defocused vocal images. Thankfully, sibilance was almost always kept at bay.

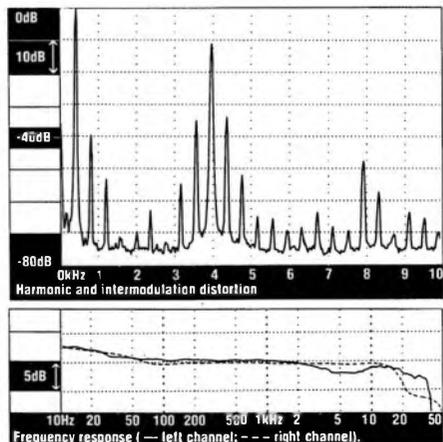
## CONCLUSIONS

The *K5* is not a Linn *K9* on the cheap - what it gains by sounding smooth and inoffensive, it loses for lack of pizzaz and excitement. However, in certain quarters this might be considered a bonus so the *K5* is certainly worth a cautious Recommendation.

## TEST RESULTS

Type, body mass Moving-magnet, 5.8g

Stylus type	Elliptical, 300x700µm		
Compliance, vert/lat	15.1cu/12.5cu		
Tracking Force Range/Test	1.5g-2.5g/2.0g		
Tracking ability, L/R	>80µm/76µm		
LF res., vert/lat	10Hz @ 12dB, 11Hz @ 15dB		
Output at 1kHz, 5cm/sec, L/R	3.270/2.856mV		
Separation, L/R	100Hz	1kHz	15kHz
	28.8/24.8	27.9/23.4	29.9/27.6dB
	Channel balance 1.17dB		
Coil resistance	424.7ohm		
Vertical Tracking Angle	23 degrees		
Loading Requirements	47kohm/100-300pF		
Typical retail price	£30		



RECOMMENDED

# When Music Is Important It's Not What You Know But Where To Go.



**MISSION**  
ELECTRONICS



**MISSION**  
ELECTRONICS



**MISSION**  
ELECTRONICS



**MISSION**  
ELECTRONICS



**MISSION**  
ELECTRONICS

*The advice isn't new, but it still holds true: choosing your hi-fi dealer is more important than choosing your hi-fi equipment. Find the right dealer, and he'll guide you to the equipment that's right for your needs.*

*Introducing and evaluating equipment keeps most magazines fully occupied. There's seldom the opportunity to do a similar introduction for hi-fi retailers, which is why we at Hi-Fi Experience have decided to tell you something about our seven specialist hi-fi shops around the country. There are three in London, all wholly owned by Hi-Fi Experience plc, and franchises which we directly control in Birmingham; Bradford, West Yorkshire; and Leamington Spa in Warwickshire and Glasgow, Scotland. Each store has a highly individual character of its own if not the building, then the manager! Yet each benefits from being part of a multiple retailer.*

*From your, the customer's point-of-view, that means our shops are ready to help each other when it comes to obtaining an item of equipment you especially want to listen to. Each one stocks a range of equipment - much of it British-made-tai ored to the requirements of its own customers, but there is a standard of service that's common to all.*

*The three years that Hi-Fi Experience has been operating have shown us that, with incr ased leisure time, people everywhere are putting a higher value on good hi-fi. In addition, we've all lately come to expect better service regardless of what we're buying, and there was an urgent need for hi-fi retailing to reflect that trend and finally move away from the 'boxes over the counter' approach of a few years ago.*

*At Hi-Fi Experience we decided to offer a new level of service, one that would apply without qualification at all our shops, regardless of where they were or how big they were. That meant stocking only equipment we were satisfied with, in terms of sound quality, construction, reliability and after-sales service. We had to be able to demonstrate that equipment to the best of its capabilities, and that meant implementing an ongoing programme to ensure our listening rooms and setting-up procedures met that requirement.*

*There is a constant effort to improve the comfort and ambience of our demonstration rooms, to make selecting and comparing equipment as relaxed and enjoyable a process as possible.*

*Of course, the best equipment and the best demonstration facilities would count for nothing if we didn't believe we also had the best staff. Good staff is a product of good training, and we invest heavily to ensure the people you will encounter in our shops know their equipment, and how to get the best from it. We undertake the kind of staff training courses that are far-from-commonplace in hi-fi retailing.*

*It's all part of an effort to offer you a level of service that's way above ther st, but should you find you don't get that level of service from one of our shops, let us know and w 'll do something about it. We have confidence in ourselves, and we want you to have confidence in us.*

*Each of our shops will do some things slightly differently: we encourage an individual approach to customers' requirements. But the minimum we expect from each one is good demonstration facilities; comfortable, well-furnished places in which to listen; an exchange-if-not entirely satisfied procedure; and fair prices. We also hope they'll convince you that good hi-fi can look good, too, and that you don't need the likes of a Gold Visa card to obtain it! All our shops offer sound-value, inexpensive equipment which will form the basis of a reliable system for years to come.*

*It's worth adding that Hi-Fi Experience plc is a member of the British Audio Dealers' Association (BADA) as are some of our shops on an individual basis. All, however, trade within the terms laid down in BADA's charter, and most often exceed them.*

*Most people enjoy the experience of r corded music and the world is a richer place for it. Our name means we can help you share that experience.*



**MISSION**  
ELECTRONICS

**NEW SHOP  
GLASGOW**



**MISSION**  
ELECTRONICS

# HI-FI EXPERIENCE PLC

**Lion House W1**  
227 Tottenham Court  
Road, London, W1.  
Tel: 01-580 3535

**Camden**  
2/4 Camden High Street,  
Camden Town, NW1.  
Tel: 01-388 1300

**Alfred Pl. WC1**  
32/34 Alfred Place,  
Store Street, London,  
WC1. Tel: 01-631 4917

**NEW SHOP**

**Glasgow**  
145 Bath Street,  
Scotland.  
Tel: 041 226 4268

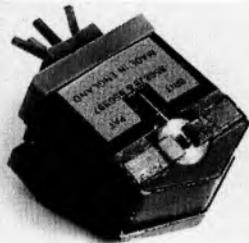
**Bradford**  
Erick's,  
Rawson Square.  
Tel: 0274 309266

**Leamington Spa**  
49 Park Street,  
Leamington Spa, Warks.  
Tel: 0926 881500

**Birmingham**  
Superfi, 67 Smallbrook,  
Queensway.  
Tel: 021-631 2675

# LONDON MAROON

PRESENCE AUDIO, THE OLD POST HOUSE, PLUMMERS PLAIN, HORSHAM, W. SUSSEX. TEL: (0403) 76777.



The high-output Decca (now known as the London) is something of a living fossil amongst modern-day cartridges. It is characterised by a vertically-oriented cantilever, supported with a perpendicular tie-wire and surrounded by a high resistance, high inductance coil (1.5kohm, 69mH respectively). One lateral and two vertical coils are employed in this 'sum and difference' pick-up, though the output is phase negative so experimentation with loudspeaker polarity might be useful. It may be a cheaper Decca, but the use of a crude spherical stylus seems a trifle misplaced.

## LAB REPORT

Distortion increased at the frequency extremes, with odd-order IMD and THD products dominating the spectrum through non-linearities inherent in the generator. We measured 9.6 per cent 3rd-order SMPTE IMD and 4 per cent THD at 300Hz (+9dB re. 11.2µm). VTA proved to be a highly unusual

6 degrees (!) while the lateral subsonic resonance peaked at +29dB – arm/cartridge damping is certainly needed. The frequency response broke up above 11kHz, rising erratically by +3.8dB to 20kHz and incurring subsequent resonances at 30, 34.6 and 39kHz.

## SOUND QUALITY

The *Maroon* pumps a considerable amount of spurious mechanical energy through its rather flimsy structure. Reflection occurs at the arm interface and the resultant needle-talk may prove exceedingly irksome. Typically fast and dynamic it made up for its lean bass character with a pleasantly transparent and deep midband, populated with surprisingly tactile stereo images. Vocals could sound unusually expressive and articulate, but this sense of integration and control was not maintained at higher frequencies.

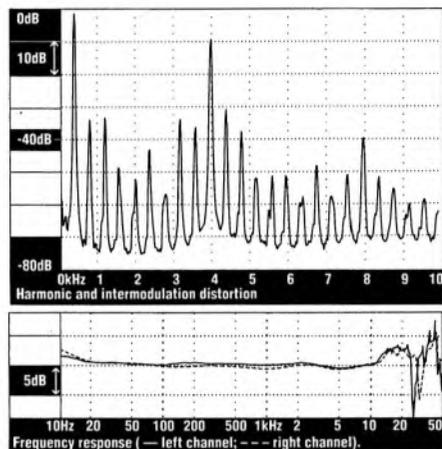
## CONCLUSIONS

This audio oddity's performance remains a trifle mixed, a condition likely to polarise opinion. Consequently, the *London Maroon* can rely on a small number of diehard aficionados to maintain its lineage, even if a general recommendation is inappropriate.

## TEST RESULTS

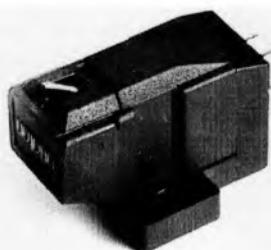
Type, body mass moving-coil, 6.8g  
Stylus type Dia-spherical, 15.3µm dia

Compliance, vert/lat	3.9cu/22.2cu		
Tracking Force Range/Test	1.5g-3.0g/2.0g		
Tracking ability, L/R	79µm/79µm		
LF res., vert/lat	19Hz @ 20dB, 8Hz @ 29dB		
Output at 1kHz, 5cm/sec, L/R	3.221/3.357mV		
Separation, L/R	100Hz	1kHz	15kHz
	19.5/20.6	22.3/23.6	20.7/19.5dB
Channel balance	0.36dB		
Coil resistance	1.516kohm		
Vertical Tracking Angle	6 degrees		
Loading Requirements	47kohm		
Typical retail price	£109		



# ORTOFON 520

ORTOFON UK LTD., DENMARK HOUSE, TAVISTOCK IND. EST., RUSCOMBE, TWYFORD, BERKS PG10 9NJ. TEL: (0734) 343621.



Three interchangeable 500-series cartridges have been introduced by Ortofon, the 520 employing a straightforward (nude) elliptical profile stylus. A tough non-resonant plastic body can, together with fully enclosed mounting lugs make for a very solid, if lightweight, package. In addition, the stylus guard folds back to reinforce the upper side of the cartridge body; a neat idea that also prevents the guard from adding its own resonant colorations. The 520 will track up to 80µm with a 1.6g downforce but its low body mass and asymmetric compliance might pose a problem for some tonearms.

## LAB REPORT

Increasing the load capacitance to 400pF moves the strong HF resonance (+3dB) to 8.2kHz while a lower parallel capacitance gives rise to a smoother, though still mildly rising HF characteristic. Oddly (for Ortofon) the VTA was wildly out at 30 degrees, resulting in an addition to the total vertical distortion

of 5.2 per cent. Output was suitably high at 3.4mV (note high 1.16kohm coil resistance) and the crosstalk spectrum very even.

## SOUND QUALITY

The 520 provided a fresh and lively rendition of simple, well-recorded passages though a hint of a cold brashness pervaded more complex works, especially those with a complement of brass. Low bass notes were conspicuous by their absence, though the cartridge still retrieved much of the original ambient detail and spaciousness captured at the point of recording. The 520 was very clean and articulate, perhaps slightly chilly at times, but not overtly clinical. One could sum it up as lean but clean.

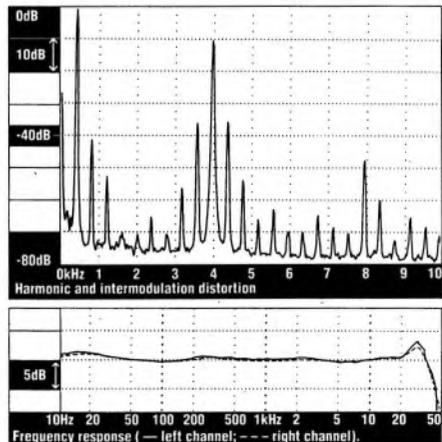
## CONCLUSIONS

In ideal circumstances the Ortofon 520 should be auditioned with a relatively low parallel capacitance if a treble 'sting' is to be avoided. So, while missing out on the degree of warmth and richness necessary for a Best Buy rating, the buoyant, effervescent character of the 520 deserves a clear Recommendation.

## TEST RESULTS

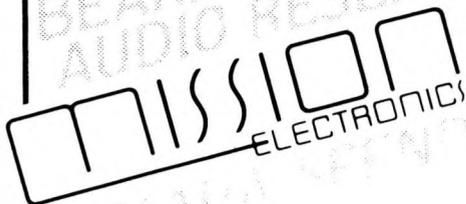
Type, body mass Moving-magnet, 5g  
Stylus type Nude elliptical  
Compliance, vert/lat 15.8cu/32.3cu

Tracking Force Range/Test	1.25g-1.75g/1.6g		
Tracking ability, L/R	>80µm/80µm		
LF res., vert/lat	10Hz @ 11dB, 7Hz @ 12dB		
Output at 1kHz, 5cm/sec, L/R	3.471/3.340mV		
Separation, L/R	100Hz	1kHz	15kHz
	27.4/29.5	23.0/24.3	24.1/25.8dB
Channel balance	0.34dB		
Coil resistance	1.158kohm		
Vertical Tracking Angle	30 degrees		
Loading Requirements	47kohm/100-200pF		
Typical retail price	£50		



RECOMMENDED

FOR  
25 YEARS  
WE'VE BEEN  
MIXING  
WITH THE  
RIGHT  
COMPANY

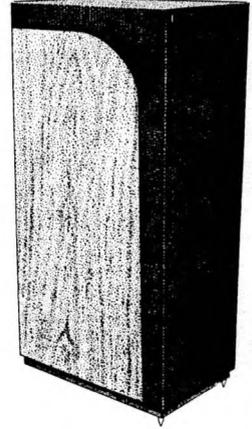
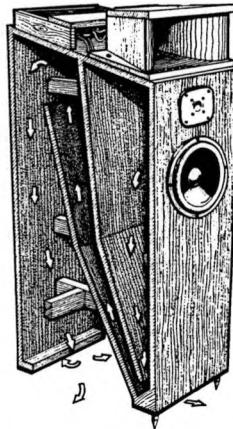


Without doubt — we require the same standards of service you have come to expect from us over the years. But don't just take our word for it, come in and experience the confidence we have in recommending and demonstrating **Mission Cyrus** only the very best in High Fidelity Equipment will do.

**Spaldings**  
ESTABLISHED IN SOUND  
01 654 1231/2040 - 352/4 LOWER ADDISCOMBE ROAD, CROYDON, SURREY.



# The Sound Room of Norbury



SIMPLY MADE  
FOR  
EACH OTHER  
ABSOLUTE  
CLARITY



Townshend Rock

Custom built State of the Art Horns.  
Introducing the awesome new Impulse H I full range horn loaded loudspeakers. Lows that go down to the bowels of the earth. Highs that sing sweetly and a midrange that flows with an effortless freedom.

#### AGENCIES INCLUDE:

ORACLE · BEARD AUDIO · ESOTERIC AUDIO  
RESEARCH · KISEKI-MILLTEK · AUDIO  
INNOVATIONS · ZETA · SNELL · MICHELL  
GYRODEC · THE VOYD · VALDI · HIGHPHONIC  
MCA 3 · IMPULSE H4 · AUDIO NOTE · HELIUS  
AUDIO · STATIC · MDM · SPICA · VECTEUR  
JECKLIN · DECCA · GARROTT P-77 · GOLDRING  
GRANT · SAE COMPACT DISC · ALPHASON  
VAN DEN HUL · INFINITY · KUZMA · COPLAND  
FOUNDATION · ELITE ROCK · AUDIO TECHNICA  
GLANZ · GRADO · NAGAOKA · ORTOFON  
SHURE · STAX · TARGET · DNM

#### SOUND ROOM SPECIALS

##### EX DEMONSTRATION

	Retail Price	Sale Price
LINN LK1-LK2.....	£900	£550
SONUS FABER.....	£1200	£995
AUDIO RESEARCH SP11.....	£5250	£2950
AUDIO RESEARCH SP8.....	£1988	£825
AUDIO RESEARCH D115 MKII NEWVALVES.....	£3331	£1950
TRIAD SPEAKERS NEW.....	£865	£695
REVOX SYMBOLS LOUD SPKS.....	£1500	£695
INCA TECH CLAYMORE.....	£300	£225
REGA RB300 SILVER WIRED.....	£195	£125
AUDIO INNOVATIONS 500.....	£750	£550
KRELL KSA50.....	£2550	£1100
SNELL TYDEK.....	£450	£275

#### PREVIOUSLY OWNED

SD1 LOUSPEAKERS £850  
COUNTERPOINT SA7 £450  
ROBERTSON 4010 £450  
SNELL TYPE E £725

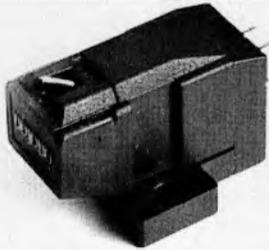
OPEN 7 DAYS AND EVENINGS  
DEMONSTRATIONS BY APPOINTMENT ONLY

PHONE 01-764-9295



# ORTOFON 540

ORTOFON UK LTD., DENMARK HOUSE, TAVISTOCK IND. EST., RUSCOMBE, TWYFORD, BERKS PG10 9NJ. TEL: (0734) 343621.



As Ortofon's top moving magnet cartridge, the 540 is graced with a FG II (Fritz Gyger) stylus profile. The same black cartridge body, integral guard and 'naff' alloy mounting bolts are supplied, but Ortofon has thought to add one of its super little tracking force gauges to the 540 package. Care has been taken over the geometric alignment of the 500-series generator while specially slit pole pins are said to reduce spurious eddy currents and therefore improve the HF response.

## LAB REPORT

Once more, the 540 proved highly sensitive to capacitive loading. At 100pF the response was +2.55dB up at 20kHz (+6.25dB at 27.3kHz) while increasing the load to 360pF effected a further rise above 2kHz, reaching +2.3dB at 7.87kHz but falling thereafter to -3.23dB at 20kHz. Vertical alignment was poor (VTA = 26 degrees) but the low 5.2 per cent 2nd-order SMPTE IMD indicates a fine lateral geometry. Compliance was simply far

too high because so few low mass tonearms are now available.

## SOUND QUALITY

As expected, the 540 was not only critical of loading but also of the amplifier's ultrasonic performance. Nine times out of ten it simply sounded too bright and forward with a sharp, fizzy treble quality that dominated the reproduced sound. Vocals were mercifully free of acerbic sibilance but percussive instruments possessed an unrealistic speed and attack, that became fatiguing with prolonged exposure. By comparison, low bass notes seemed drained of impact and solidity which, for example, altered the perception of strong rhythm lines.

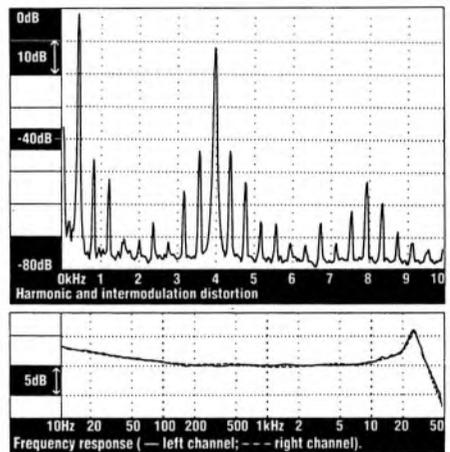
## CONCLUSIONS

In terms of pace and sonic brilliance the 540 is a leap ahead of the 520. However, the 540 lacks any sense of euphony and can easily appear cold, unforgiving or plain harsh. In the right combination it may well shine but the Ortofon 540 remains too finicky for general consumption.

## TEST RESULTS

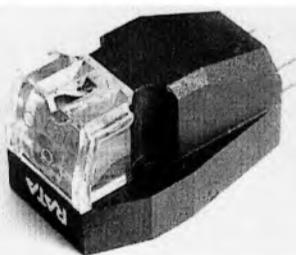
Type, body mass	Moving-magnet, 5g
Stylus type	Fritz Gyger II
Compliance, vert/lat	32.3cu/43.9cu
Tracking Force Range/Test	1.0g-1.5g/1.5g

Tracking ability, L/R	>80µm/>80µm
LF res., vert/lat	7Hz @ 10dB, 6Hz @ 12dB
Output at 1kHz, 5cm/sec, L/R	3.754/3.558mV
Separation, L/R	100Hz 1kHz 15kHz
	27.9/24.5 27.3/20.4 27.6/22.8dB
Channel balance	0.47dB
Coil resistance	1.158kohm
Vertical Tracking Angle	26 degrees
Loading Requirements	47kohm/100-200pF
Typical retail price	£100



# RATA RP70 vdH

RATA LTD., EDGE BANK HOUSE, SKELMSMERGH, KENDAL, CUMBRIA LA8 9AS. TEL: (0539) 83247.



Top of the range of RATA cartridges based around the Goldring Epic generator, the RP70vdH benefits from a new alloy cantilever and exquisitely finished extended line contact stone. Goldring's Pocan body is used but RATA has ensured that all the internal pole-pieces are firmly glued to minimise undesirable resonances. A firm bond between head-shell and cartridge is possible but its physical bulk can be a little awkward at times.

## LAB REPORT

Channel separation was rather weak (a function of the cheap generator) but output was very healthy at 5mV. With a 300pF load the frequency response was very flat until 10kHz when it rose +2.7dB at 18kHz - ultrasonic resonances were suitably suppressed. Tracking was secure at 80µm while the distortion - though moderate - was principally composed of innocuous 2nd-order components. In view of the +16dB resonance light damping might be advisable.

## SOUND QUALITY

The vdH version of RATA's RP70 offered a thoroughly detailed, clear and pleasantly transparent perspective, qualities not immediately associated with the Vital-tipped version. Treble transients were fast and explicit while rarely sounding harsh or exaggerated, a factor influenced by the fresh and open acoustic enjoyed at high frequencies. Bass notes were equally quick and lucid but lacked much of the impact or 'slam' enjoyed with equivalently-priced MCs for instance.

More importantly, the RP70vdH remained quite unruffled when handling fairly complex works. The individual character of each instrument in an ensemble was faithfully revealed, including massed strings rich in subtle harmonics.

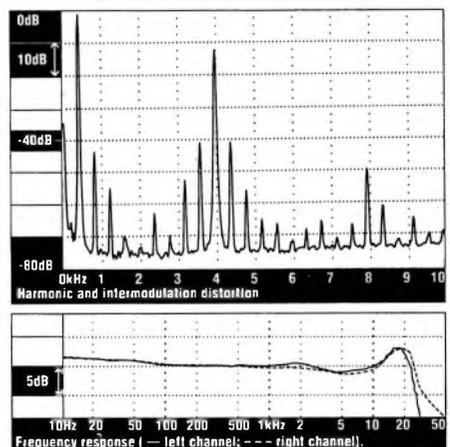
## CONCLUSIONS

RATA's most expensive MM competes on level terms with various respected MCs at this price point. It may not sound quite as full or weighty but combines a quickness with a delicate transparency and fine detail resolution. On this basis alone the RP70vdH earns itself a firm Recommendation.

## TEST RESULTS

Type, body mass	Moving-magnet, 7.6g
Stylus type	van den Hul I

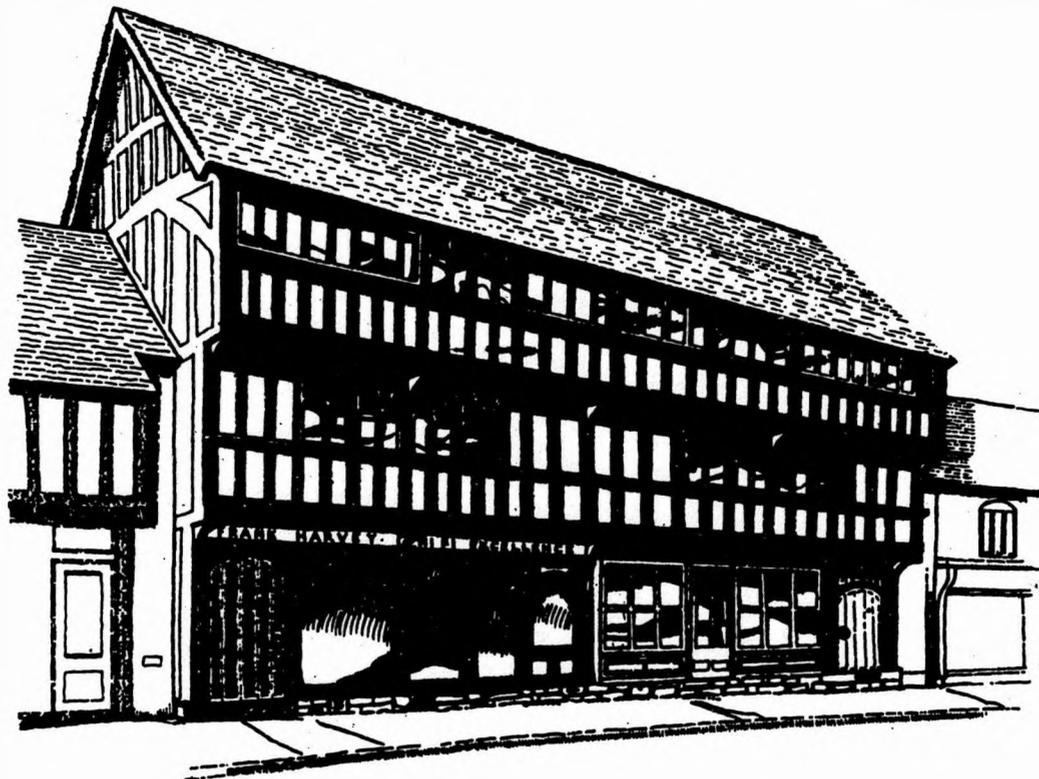
Compliance, vert/lat	6.8cu/16.8cu
Tracking Force Range/Test	1.5g-1.8g/1.7g
Tracking ability, L/R	>80µm/>80µm
LF res., vert/lat	12Hz @ 13dB, 9Hz @ 16dB
Output at 1kHz, 5cm/sec, L/R	5.218/4.762mV
Separation, L/R	100Hz 1kHz 15kHz
	25.7/23.8 22.5/19.8 22.7/22.5dB
Channel balance	0.80dB
Coil resistance	686.8ohm
Vertical Tracking Angle	29 degrees
Loading Requirements	47kohm/300-400pF
Typical retail price	£99



RECOMMENDED

# FRANK HARVEY HI-FI EXCELLENCE

TECHNOLOGY OF THE FUTURE  
DEDICATION OF THE PAST



*OUR MOVE IS COMPLETE*

3 FLOORS - 3 SINGLE SPEAKER DEMONSTRATION ROOMS  
3000 SQ FEET IN THE PURSUIT OF HI-FI EXCELLENCE

SELECTED PRODUCTS FROM SELECTED AGENCIES

A & R CAMBRIDGE  
ARISTON  
AUDIO TECHNICA  
BOWERS & WILKINS  
CELESTION  
CYRUS  
DENON  
DUAL  
HEYBROOK  
KEF

LINN  
MARANTZ  
MISSION  
MONITOR AUDIO  
MORDAUNT SHORT  
NAGAOKA  
NAKAMICHI  
NAD  
MUSICAL FIDELITY  
QUAD

QED SYSTEM LINE  
ROGERS  
ROTEL  
SENNHEISER  
SHURE  
TANNOY  
THORENS  
YAMAHA  
WHARFESALE



**LINN**  
HIGH FIDELITY  
YOU'VE NEVER HEARD IT  
SO GOOD.

BECAUSE PEOPLE LIKE MUSIC

MUSICAL FIDELITY

## FRANK HARVEY

163 SPON STREET, COVENTRY CV1 3BB. 0203 525200  
Unit 4 Western Road Ind Est., Stratford on Avon 0789 414533



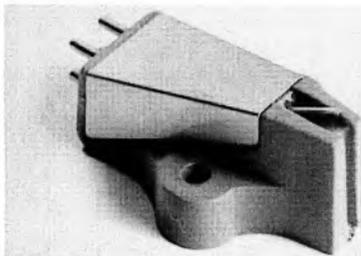
NICE  
STAFF

# HI-FI MARKETS

NICE  
COFFEE

# REGA BIAS

REGA RESEARCH, 119 PARK STREET, WESTCLIFFE-ON-SEA, ESSEX SSO 7PD. TEL: (0702) 33071.



In the light of the success Rega has enjoyed since the launch of its *RB250* and *RB300* tonearms, the introduction of two accompanying cartridges is long overdue. Cheapest of the pair is the *Bias*, a moving magnet with a *fixed* stylus assembly! The shallow body is fashioned from a loaded polymer akin to Pocan, its diminutive profile designed to reduce any resonances in the structure. Spinex-II magnets are employed inside and the elliptical diamond is push-fitted into a long alloy cantilever.

## LAB REPORT

The compliance of this cartridge was very symmetrical but at 34cu only really suitable for use with low mass arms.

The left channel was wired out of phase with respect to the right, a situation that was corrected before auditioning. As a result of the low coil resistance and inductance (for a MM) and close proximity of coils the source capacitance registered a high 170pF. SMPTE

IMD was quite high, the 3.1 per cent 3rd-order figure indicating a generator non-linearity. Channel separation reached a maximum of 30.1dB at 7kHz but still offered a fine 26.7dB as far up as 24.5kHz! One channel was some +2.5dB up at 18kHz but both rose to +3.7dB at 20Hz.

## SOUND QUALITY

While other MMs in this survey sounded distinctly bright or tizzy, the *Rega Bias* afforded an altogether smoother, weightier perspective of musical events. Low bass notes were occasionally blighted with a ponderous energy, but stereo images were nicely focused and not forcefully projected. This was equally true throughout the treble region, percussive sequences enjoying a sweet tonal quality.

## CONCLUSIONS

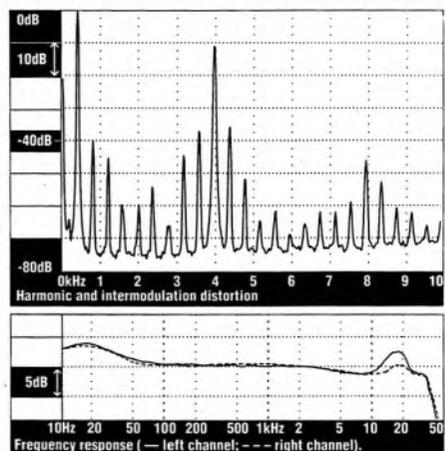
Rega needs to tighten up on its quality control if phase anomalies are to be avoided, a factor that would undoubtedly compromise the sound of the *Bias*. Nevertheless, though the refined but faintly laid-back balance of the cartridge is best suited to the more forward-sounding of systems, the *Bias* still remains worthy of consideration.

## TEST RESULTS

Type, body mass

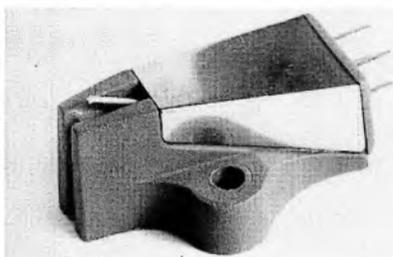
Moving-magnet, 4.1g

Stylus type	Nude elliptical, 5 $\mu$ m x 17.8 $\mu$ m		
Compliance, vert/lat	34.2cu/34.2cu		
Tracking Force Range/Test	1.5g-2.0g/1.8g		
Tracking ability, L/R	>80 $\mu$ m/78 $\mu$ m		
LF res., vert/lat	7Hz @ 12dB, 7Hz @ 15dB		
Output at 1kHz, 5cm/sec, L/R	4.162/4.249mV		
Separation, L/R	100Hz	1kHz	15kHz
	27.1/24.5	27.8/22.2	24.7/22.5dB
Channel balance	0.18dB		
Coil resistance	187.9ohm		
Vertical Tracking Angle	25 degrees		
Loading Requirements	47kohm/300-400pF		
Typical retail price	£34		



# REGA ELYS

REGA RESEARCH, 119 PARK STREET, WESTCLIFFE-ON-SEA, ESSEX SSO 7PD. TEL: (0702) 33071.



The *Elys* is distinguished from its cheaper brother by dint of a grey polymer body, and it also features a threaded stainless steel insert in the nose of the cartridge. An extra-rigid three-point mounting can then be achieved with appropriate tonearms – the *RB300* for instance! The same stylus assembly is employed but the generator tolerances are tighter. Rega winds its coils directly onto a horseshoe-shaped pole-piece, resulting in a pole gap of 10-11 thou on the *Elys* and 12-13 thou on the *Bias*.

## LAB REPORT

SMPTE IMD was just as high as it was with the *Bias* while its tracking ability was reduced to 70/65 $\mu$ m. Nevertheless, its squarewave linearity (-40dB), midband crosstalk (32-37dB) and compliance (16cu) were all excellent for this type of cartridge. The *Elys* proved reasonably tolerant of loading but demonstrated a +5dB rise at 20Hz in addition to a -2.4dB suckout around 6kHz.

Increasing from 100pF to 400pF simply lifted the peak at 17.5kHz by 1.5dB. The cartridge is phase inverting.

## SOUND QUALITY

Subjectively, the *Elys* appeared to be well extended at the frequency extremes with tight stereo focus and low susceptibility to background noise. Able to recreate a dark acoustic populated with stable, believable images it is the *Elys*' LF performance that is likely to upset some partnering amps/loudspeakers, such as the wealth and resolution of detail in this region.

Compared with the *Bias*, vocalists possessed a greater sense of articulation without incurring any additional sibilance though there were times when strong percussive sequences felt slightly 'cold' or 'tizzy'. With sympathetic ancillaries it sounded both tightly honed and convincingly rhythmic.

## CONCLUSIONS

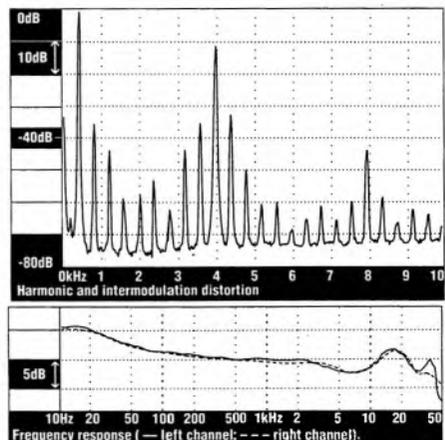
The *Elys* offers somewhat more than a simple 'refinement' over the *Bias*. Its perceived balance is that much more neutral, in addition to being considerably more tactile. In all, the inherently rich, smooth and musical presentation should win it many friends.

## TEST RESULTS

Type, body mass

Moving-magnet, 4.5g

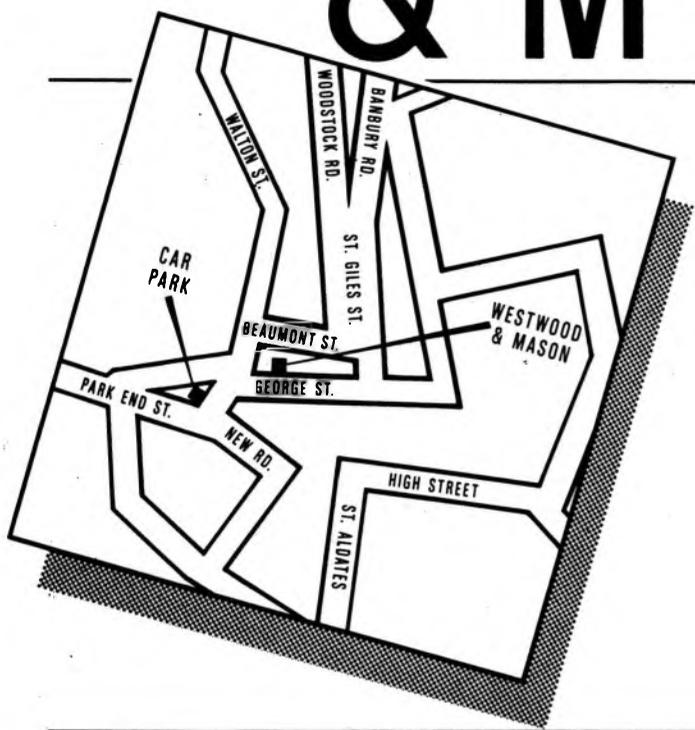
Stylus type	Nude elliptical, 5 $\mu$ m x 17.8 $\mu$ m		
Compliance, vert/lat	16.3cu/13.5cu		
Tracking Force Range/Test	1.6g-2.0g/1.8g		
Tracking ability, L/R	70 $\mu$ m/65 $\mu$ m		
LF res., vert/lat	10Hz @ 10dB, 11Hz @ 13dB		
Output at 1kHz, 5cm/sec, L/R	4.648/4.210mV		
Separation, L/R	100Hz	1kHz	15kHz
	23.4/24.5	36.7/35.7	31.5/30.7dB
Channel balance	0.87dB		
Coil resistance	191.7ohm		
Vertical Tracking Angle	30 degrees		
Loading Requirements	47kohm/100-200pF		
Typical retail price	£74		



RECOMMENDED

# WESTWOOD & MASON

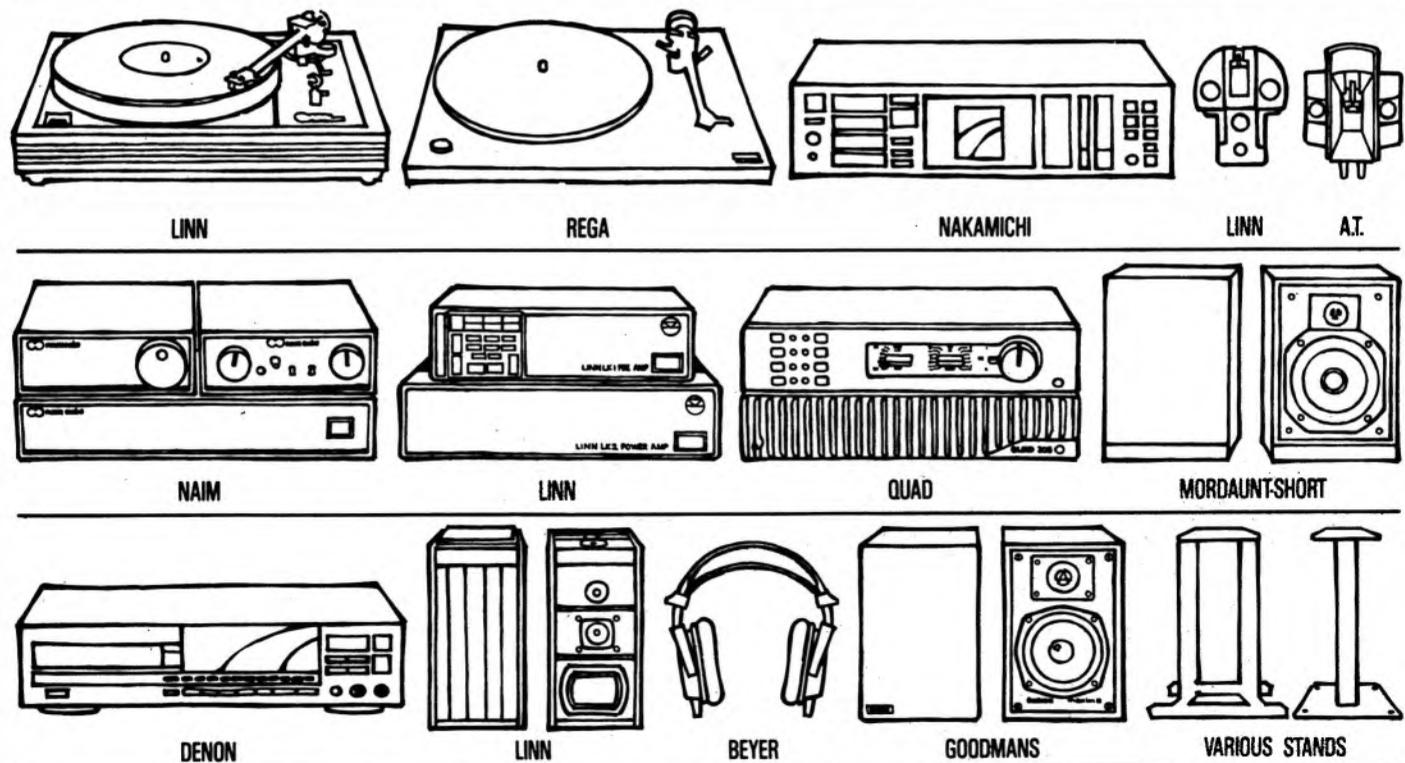
**OXFORD**



THE FINEST EQUIPMENT  
PLUS THE BEST SERVICE  
MEANS YOU ACHIEVE THE  
MOST MUSICAL RESULTS.

WE STOCK EQUIPMENT FROM:

A&R, AUDIO TECHNICA, BEYER, CREEK, DENON,  
DUAL, EPOS, GOODMAN'S, HARBETH, HEYBROOK,  
INCATECH, KEF, LINN, MARANTZ, MONITOR AUDIO,  
MORDAUNT-SHORT, NAIM, NAKAMICHI, ORTOFON,  
QUAD, QED, REGA, ROTEL, SENNHEISER, SPENDOR,  
TANNOY, TEAC, YAMAHA.



LINN                      REGA                      NAKAMICHI                      LINN                      A.T.

NAIM                      LINN                      QUAD                      MORDAUNT-SHORT

DENON                      LINN                      BEYER                      GOODMAN'S                      VARIOUS STANDS

WESTWOOD & MASON (OXFORD) LTD.  
46 GEORGE STREET,  
OXFORD OX1 2AN.  
TEL: 0865-247783

- ▶ PART EXCHANGE.
- ▶ DEMONSTRATIONS BY APPOINTMENT.
- ▶ CLOSED ON THURSDAYS.

# REVOLVER

SEE LTD., BBCS, BEWSEY ROAD, WARRINGTON WA5 5JU. TEL: (0925) 571173.

BEST BUY



Purchased in bulk from Audio Technica each *Revolver* cartridge starts life as a humble *AT95E*. Samples are chosen on the basis of channel balance and stereo separation and the unit is then dismantled, internally damped with silicone and then reassembled with a tough glue – stylus included. Replacement cartridges are available under a generous exchange scheme for just £8. This standard MM design is ideally suited to a wide range of tonearms though the enclosed mounting lugs are a little too close to the body to accommodate decent steel bolts.

## LAB REPORT

A diasa-elliptical stylus is fitted which determines the linearity of the cartridge at high frequencies – note the increase in distortion at HF (see plot). With RIAA equalisation the 10.8kHz/270Hz residue would pop up at 5.3 per cent while the important 3rd-order SMPTE IMD product (without equalisation) is still rather high at 2.1 per cent. A strong LF

resonance is associated with a rise in output below 200Hz, reaching +7.2dB at 10Hz. Crosstalk was very even (typ. 22-24dB mid-band) though an anomalous dip at 17kHz (29.5dB) misrepresents the published 15kHz channel separation. At 10kHz the separation is just 16.8dB for instance.

## SOUND QUALITY

The *Revolver's* broad and ill-controlled LF characteristics manifested as a subjective 'slowness', a diffuse rather than obviously boomy quality. However, the positive aspects of its performance, its buoyant and lively standpoint, proved most beguiling. The mid and treble possessed great zest and enthusiasm without really going over the top even though strong treble notes were a trifle crude.

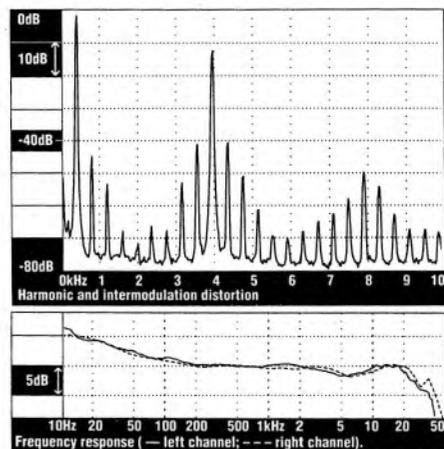
## CONCLUSIONS

*Revolver's* elementary modifications have transformed a very good budget cartridge into a great little performer. Although the cartridge may sound a trifle raucous, correct loading can yield a very approachable balance. This is a fairly 'musical' sounding device and a clear Best Buy.

## TEST RESULTS

Type, body mass	Moving-magnet, 5.9g
Stylus type	Diasa-elliptical, 400µm x 700µm

Compliance, vert/lat	10.4cu/18.5cu
Tracking Force Range/Test	1.6g-1.9g/1.7g
Tracking ability, L/R	>80µm/>80µm
LF res., vert/lat	12Hz @ 13dB, 9Hz @ 16dB
Output at 1kHz, 5cm/sec, L/R	3.929/3.571mV
Separation, L/R	100Hz 1kHz 15kHz
	25.4/24.7 21.3/20.3 28.8/27.0dB
Channel balance	0.84dB
Coil resistance	411ohm
Vertical Tracking Angle	26 degrees
Loading Requirements	47kohm/100-200pF
Typical retail price	£20



# STILTON AT-F3 SB

PATH GROUP PLC, UNIT 2, DESBOROUGH IND. PARK, HIGH WYCOMBE HP12 3BG. TEL: (0494) 459981.

RECOMMENDED



Supplied through the Path Group these *AT-F3s* have been structurally modified by Stilton Audio. After selection the mounting plate is removed, the generator assembly loaded with epoxy resin and a new mounting bracket fitted under temperature and pressure. This bracket is milled from a solid billet, and the finished product looks very much more professional than the earlier Stilton-modified Nagaokas. Bodyweight is increased by 0.75g but the cartridge is still most suitable for use with medium effective mass tonearms.

## LAB REPORT

A vast improvement in 2nd-order IMD implies a far more accurate lateral alignment in this cartridge, while the wideband frequency response demonstrates a significant reduction of ultrasonic noise (resonances?). The output is also reduced by 2dB above 10kHz, which is an important subjective factor. HF distortion is extremely low (0.19 per cent without equalisation) but AT's channel

asymmetry remains to haunt this cartridge.

## SOUND QUALITY

The clear-cut, incisively detailed character of the latest *AT-F3* was present though the Stilton body ensured that more control was exercised over fast, dynamic treble detail. In this respect the *AT-F3/SB* exceeded the high frequency resolution of the *AT-F5*, being both marginally cleaner and sharper in focus. This was particularly true of massed strings: those arduous modulations holding no fear for the *AT-F3/SB*, which successfully isolated the timbre of each instrument without losing the wholesome integration that ensures a thoroughly believable and musical performance.

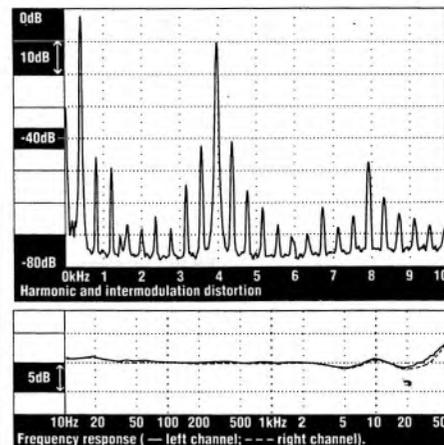
## CONCLUSIONS

The solid-body Nagaoka cartridges failed to exploit their new-found rigidity if only because they were fitted with relatively flimsy *detachable* styli. No such compromise is evident with the Audio Technica MG, the Stilton modification lending sufficient extra poise and refinement to ensure a warm Recommendation.

## TEST RESULTS

Type, body mass	moving-coil, 5.75g
Stylus type	Biradial, elliptical, 200x700µm
Compliance, vert/lat	12.5cu/18.7cu
Tracking Force Range/Test	1.25g-1.75g/1.6g

Tracking ability, L/R	>80µm/>80µm
LF res., vert/lat	11Hz @ 10dB, 9Hz @ 14dB
Output at 1kHz, 5cm/sec, L/R	344.5/327.2µV
Separation, L/R	100Hz 1kHz 15kHz
	23.7/25.0 31.5/24.9 26.5/22.1dB
Channel balance	1.45dB
Coil resistance	11.75ohm
Vertical Tracking Angle	22 degrees
Loading Requirements	>20ohm
Typical retail price	£110



# SELECTED 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

ABSOLUTE SOUND AND VIDEO, 65 Park St, Clifton, Bristol. (0272) 264975. A&R, Denon, Dual, Linn, Mission, NAD, Quad, Roksan, Rotel, Yamaha, etc. (closed Weds). BADA MEMBER **3202**

PAUL GREEN HI-FI LTD, Kensington Showrooms, London Rd, Bath (0225) 316197. A&R, Creek, Dual, Heybrook, Linn, Musical Fidelity, Rotel, Systemdek, Wharfedale. BADA MEMBER **3202**

RICHER SOUNDS, 20 Cotham Hill, Bristol BS6 6LF. (0272) 734397. City-centre budget hi-fi discounts; most popular 'majors' from A to Z and all points in between; monthly 'specials'. Facilities: expert advice; free 48 page Hi-fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sats 10-5. Access, Visa, Richer ChargeCard.

## BEDFORDSHIRE

ASHTON AUDIO, 6 High Street, Dunstable. (0582) 608003. AR, Cambridge Audio, Denon, JVC, Monster, NAD, Nakamichi, Quad, Rotel, Sony, etc. Credit to £1,000. Access, Amex, Diners, Visa. Service dept. Open 9-5.30, 6p.m. Friday.

## BERKSHIRE

READING HI-FI CENTRE, 4-6 Harris Arcade, Friar St, Reading. (0734) 585463. The best equipment, advice and service from Berkshire's premier Hi-Fi emporium. BADA MEMBER **3202**

## BUCKINGHAMSHIRE

AUDIO INSIGHT LTD, 53 Wolverton Rd, Stony Stratford, Milton Keynes. (0908) 561551. A&R, Audiolab, Heybrook, KEF, Linn, Mission Cyrus, Musical Fidelity, Nakamichi, Nytech, Rotel. BADA MEMBER **3202**

AYLESBURY HI FIDELITY, 98 Cambridge St, Aylesbury. (0296) 28790. Dual, Heybrook, Linn arms, Musical Fidelity, Mission, NAD, Nakamichi, Quad, Rotel, ITL. 2 Dem rooms, appointment reqd. Mon-Fri 10-6, Sat 9.30-5.30. Home trial, free installation, credit to £1,000. 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.

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.

STEVE BOXSHALL AUDIO, 41 Victoria Rd, Cambridge CB4 3BW. (0223) 68305. 10-6 - 6 days. Denon, Rotel, Dual, Monitor Audio, Tannoy, Quad, KEF, Roksan, Nakamichi, Revox, SME, Audio Research, Krell, Magneplanar. 3 dem rooms, home trial, appointment preferred. Free installation and service dept. Access, Visa and credit facilities. **3202**

## CHESHIRE

ASTON AUDIO, 4 West St., Alderley Edge. (0625) 582704. Wide selection of equipment in N.W. 2-year guarantee. 3 dem rooms. Tues-Sat 10-6. BADA MEMBER **3202**

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. BADA MEMBER **3202**

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. BADA MEMBER **3202**

SWIFT OF WILMSLOW, 4-8 St Annes Parade, Wilmslow. (0625) 526213. A&R, Aiwa, Denon, Marantz, Mission, Monitor-Audio, Pioneer, Trio, Yamaha, NAD. Dem facilities. Tues-Sat. BADA MEMBER **3202**

RICHER SOUNDS, 4 Wellington St, Stockport SK1 3RN. (061) 480 1700. Cheerfully small store by BR station with virtually all major 'budget' names; many on special offer. Facilities: expert advice; free 48 page Hi-fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6, Sats 10-5. Access, Visa, Richer ChargeCard. Mail Order for all Richer Sounds stores from this branch.

CHRIS BROOKS HI-FI, 29 Gaskell St, Stockton Heath, Warrington. 0925 61212/3. Tues-Sat 10-6. 2 dem rooms. Credit facilities. All credit cards. Total absence of bull\*\*\*\*. BADA MEMBER **3202**

## CORNWALL

N.C.E. HI-FI, The Bridge, Boscastle, N. Cornwall (08405) 248. Ariston, Arcam, Creek, Denon, Dual, Gale, Heybrook, Incatech, Marantz, QED, etc. Dem room. Full credit facilities including interest free. Access, Visa.

TRURO HI-FI & E.T.S. Ltd, 25 King St, Truro (0872) 79809. A&R, Denon, Dual, Heybrook, Linn, Mission Cyrus, Nad, Quad, Rotel, Thorens. Dem and home trial facilities. Mon-Sat 8.45-5.30. Credit to £1,000. Access, ETS Visa. Service dept.

## DERBYSHIRE

ACTIVE AUDIO, 12 Osmaston Rd, The Spot, Derby. (0332) 380385. Meridian, Mission, Denon, Yamaha, Rotel, A&R Cambridge, Monitor Audio, Trio, Marantz. Dem and home trial facilities. Open 9.30-6 - early closing Wed. Credit to £1,000. Access, Visa, Diners, American Express. Service dept.

## ESSEX

A.T. LABS, 442/4 Cranbrook Rd, Gants Hill, Ilford. (01) 518 0915. Mon-Sat, 10-6. Two single speaker dem rooms. Access, Amex, Visa. BADA MEMBER **3202**

RAYLEIGH HI-FI, 44a High Street, Rayleigh, Essex. (0268) 779762/747571. 216 Moulsham St, On-the-Parkway, Chelmsford, Essex. (0245) 265242. A&R, Audiolab, Beyer, BLQ, Cyrus, Celestion, Denon, DNM, Epos, Gale. Access, Visa. 3 years parts and labour guarantee on hi-fi systems. BADA MEMBER **3202**

BRENTWOOD MUSIC & HI-FI CENTRE, 2 Ingrave Rd, Brentwood. (0277) 221210. Alphason, B&W, Cambridge Audio, Denon, Harman Kardon, Marantz, QED, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9.30-5.30 (Thurs from 10am, Sat from 9am). Free installation, credit facilities. Access, Visa, Hi-Fi Markets. Service dept.

LYON AUDIO, 16 Peartree Business Centre, Peartree Road, Stanway, Essex CO3 5JN. (0206) 560259. Audiolab, Beard, Celestion, QED, Rogers, Denon, NAD, Rotel, J.A. Mitchell, Roksan, Gale, Quad. Dem facilities. Mon-Sat 9-6. Installations. Credit facilities up to £1000. Access, Visa, Hi-Fi Markets, Eurocheque. Service dept available.

## GLOUCESTERSHIRE

ABSOLUTE SOUND AND VIDEO, 40/42 Albion St, Cheltenham. (0242) 583960. A-R, Denon, Dual, Linn, Meridian, Mission, NAD, Rotel, Technics, Yamaha, etc. (Closed Wed). BADA MEMBER **3202**

AUDIO EXCELLENCE, 58 Bristol Road, Gloucester. (0452) 30046. Audio Research, Dual, Krell, Linn, Magneplanar, Naim, NAD, Yamaha and lots more. Closed Mon. BADA MEMBER **3202**

ROBBS OF CHELTENHAM, 3 Clarence St, Cheltenham. (0242) 584404. Sansui pure hi-fi, Kenwood, Sony ES, Dual, Technics, QED, Heybrook. Dem facilities. Mon-Sat 9-5.30. Instant free credit. Visa, Access. Service dept.

## HAMPSHIRE

ABSOLUTE SOUND AND VIDEO, 4 Feathers Lane, Basingstoke, Hants RG21 1AS. (0256) 24311. A&R, Audiolab, Denon, Dual, Linn, Mission, NAD, Rotel, Technics, Yamaha. Dem and home trial facilities. Mon, Tues, Thurs, Fri 9.30-6, Sat 9.30-5.30. Closed Wed. Free installation. Credit facilities. Access, Visa, Connect, Amex, Diners. Service dept. BADA MEMBER **3202**

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 **3202**

TRUE-FI SOUND AND VISION, 10/12 Grosvenor Rd, Aldershot. (0252) 26390. Akai, Aiwa, B&W, Nakamichi, Hitachi, JPW, Mission, Mordaunt-Short, Nagaoka, Sony, etc. Dem facilities. Mon-Sat 9.30-6.00. Free installation, credit to £1,200. Access, Visa. Service dept.

## HERTFORDSHIRE

ACOUSTIC ARTS LTD, 101 St Albans Rd, Watford, Herts. (0923) 45250. A&R, Audiolab, Denon, Magneplanar, Quad, Rogers, Meridian, TDL, Jadis, Krell. Mon-Sat 9.30-5.30. BADA MEMBER **3202**

THE AUDIO FILE, 40 Hockerill St, Bishops Cleeve, Herts CM23 2DW. (0279) 506576. 9.30-5.30 6 days. Linn, Roksan, Rega, Naim, Denon, Mission, Cyrus, Marantz, Quad, Tannoy, Sony. 2 dem rooms. Home trial, free installation service dept. Interest free. Bada Charge Card. BADA MEMBER **3202**

## ISLE OF MAN

ISLAND COMPACT DISC CENTRE, Parliament Square, Ramsey. (0624) 815521. Musical Fidelity, Sugden, Celestion, Harman Kardon, Teac, Castle Acoustics, Philips, A&R, JBL, Luxman, Bose, Sansui. Mon-Sat 9-5.00. Dem and home trial facilities. Free installation. Full credit, no limit. Access, Elite. Service dept.

## KENT

JOHN MARLEY HI-FI CENTRES, 2 Station Rd West, Canterbury. (Canterbury) 69329. Also at Dover - (0304) 207562. B&W, Heybrook, Magnum, M.Y.S.T., Nakamichi, Pink Triangle, Rotel, Sansui, Technics, Quad. Dem and home trial facilities. Mon-Sat 9-5.30 closed Thurs. Free installation. Credit to £1,000. Access, Visa, Creditcharge. Service dept.

VJ HI-FI, 29 Guildhall St, Folkestone. (0303) 56860. Mon-Sat 9-6. NAD, Yamaha, Marantz, Cambridge Audio, Denon, Kenwood, Tannoy, Rogers, Mordaunt Short, Dual. Dem and home trial facilities, free installation, credit to £1000. Amex, Diners, Visa, Access. Service dept.

## LANCASHIRE

MONITOR SOUND, 54 Chapel St, Chorley. (02572) 71935. A&R, Dual, Mission, Quad, Rogers, Rotel, Spendor, Thorens, Nakamichi, Yamaha, etc. 2 dem rooms. Open Mon-Sat, closed Weds. Free installation. Credit to £1,000. Access, Visa. Service dept.

## LEICESTERSHIRE

SOUND ADVICE, The Sound Factory, Duke St, Loughborough LE11 1ED. (0509) 218254. A&R, Creek, Linn, Epos, Mission, Cyrus, Naim, Rega, Roksan, Rotel, Yamaha. Dem facilities, appointment reqd. Mon-Sat 9.30-6. Free installation. Credit facilities. Access, Visa, Amex. Service dept. BADA MEMBER **3202**

ALPHA AUDIO, 1-3 Guildhall Lane, Leicester, LE1 5FQ. (0533) 518597 or 530330. Aiwa, Akai, Ariston, Bose, Cambridge, Celestion, Denon, Harman Kardon, Musical Fidelity, Rotel, etc. Mon-Sat 9.30-5.30. Free installation. Credit to £1,000. Dem facilities. Access, Visa.

MJS HI-FI, 80 Stapleton Lane, Barwell, Leicester LE9 8HE. (0455) 469777. The Rock, Audio Innovations, Kelvin Labs, Snell, Helius, Sugden, Ruark, Concordant, Valdi, JPW. Our main aim is for our customers to enjoy music. Dem and home trial facilities. Mon-Sat 9.30-7.00. Free installation and service dept. Visa, Access.

## LONDON

A.T.LABS, 159 Chase Side, Enfield, Middlesex. (01) 367 3132. Mon-Sat 10-6. Two single speaker dem rooms. Service dept, car park. Amex, Visa, Access.

BADA MEMBER **3202**

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 **3202**

CORNFLAKE SHOP, 37 Windmill Street (just off Tottenham Court Road), London W1. (01) 631 0472. Mon-Sat 10-7. DNM, Epos, Koetsu, Marantz, Naim, PS Audio, Rega, Roksan, SME, Yamaha. 2 dem rooms, full delivery and installation. Credit facilities. Access, Visa.

COVENT GARDEN RECORDS, 84 Charing Cross Road. (01) 379 7635/7427. Quad, B&W, Meridian, Mission, Yamaha, Sony, A&R Cambridge, Nakamichi, Rotel, etc. Dem facilities - no appointment reqd. Mon-Sat 10-7.30. Home trial facilities, free installation. Access, Visa, American Express, Diners Club. Service dept. **3202**

DOUG BRADY HI-FI, 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 **3202**

GRAHAMS HI-FI, 86-88 Pentonville Rd, London N1. (01) 837 4412. 'FBA Dealer of the year 1985'. Linn, Naim, Rega etc. £300-£3,000-£13,000. BADA MEMBER **3202**

H.L. SMITH & Co Ltd, 287-289 Edgware Rd, London W2 1BE. (01) 723 5891. Aiwa, B&W, Denon, Dual, KEF, Ortofon, Panasonic, Sony, Technics, Yamaha. Dem facilities. Mon-Sat 9-5.30, Thurs 9-1. Credit to £1,000. Access, Visa, Diners. Service dept.

KJ WEST ONE, 26 New Cavendish St, London W1M 7LH. (01) 486 8262. A&R, Audio Lab, B&W, Audio Res - Krell, Rogers, Gale, Musical Fidelity, Linn, Nakamichi, etc.

THE SOUND ORGANISATION Ltd, No. 1, Cathedral St, London Bridge, London SE1 9DE. (01) 403 2255/3088. Counterpoint, Denon, Exposure, Koetsu, Linn, Naim, PS Audio, Roksan, Rega, SME etc. Dem facilities, appointment req'd. Tues-Sat 10-7. Free installation. Access, Visa. Service dept.

RICHERSOUNDS 2, 6 London Bridge Walk, London SE1. (01) 403 1988. Major names in esoteric hi-fi, unusually matched to discount offers and special end-of-line purchases. Dem facilities, expert advice, free local delivery & installation (£500+), plus 2 Yr G'tee. Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-7, Sat 10-5. Access, Visa, Richer ChargeCard. Service Department.

RICHERSOUNDS, 2 London Bridge Walk, London SE1 2SX. (01) 403 1201/4710. The original bargain hi-fi store, now refitted; 100s of regular and special discounts on most budget/mid price major names. By London Bridge. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Open Mon-Fri 10-7, Sat 10-5. Access, Visa, Richer ChargeCard. Service Department.

## MIDDLESEX

UXBRIDGE AUDIO LTD, 278 High St, Uxbridge, Middx UB8 1LZ. (0895) 33474/31993. A&R, AR, Ariston, Creek, Cyrus, Denon, Dual, JPW, KEF, Manticore, Meridian, NAD, Nakamichi, Quad, Rotel, Wharfedale, Yamaha, etc. 2 dem rooms. Mon-Sat 10-6. BADA MEMBER

## MERSEYSIDE

W.A. BRADY & SON, 401 Smithdown Rd, Liverpool. (051) 733 6859. 'Largest choice of specialist Hi-Fi in N.W. £100-£20K'. All credit cards. 3 dem rooms.

PURE SOUND - Birkenhead 051 645 6690 24hrs. Acoustic Energy, Aragon, Audio Technica, Beard, Celestion, Deltec, Denon, Michel, Cyrodec, Ortofon, SME. Home demonstration a pleasure, plus evenings and weekends (Sundays by appointment).

RICHERSOUNDS, 69B Church St, Liverpool LI 1DN. (051) 708 7484. Virtually every major 'budget' name - small store with big discounts and special offers. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

## NORFOLK

SOUND APPROACH, 161 Unthank Road, Norwich. (0603) 622833. Ariston, AR, Claymore, Castle, Elite Rock, Heybrook, Mantra, Musical Fidelity, Revolver, Yamaha. Dem and home trial facilities. Mon-Sat 9-6.30. Free installation. Credit to £1,500. Visa, Access, Diners Club. Service dept.

## NORTHAMPTONSHIRE

CLASSIC HI-FI + VIDEO, School Lane, Kettering, Northants. (0536) 515766. ADC, Marantz, Onkyo, Sansui, Teac, Harman Kardon, Pioneer, Proton, Ariston, Thorens, Mantra, Goodmans, Castle, JPL, Mordaunt Short, Selego TV, Monitor Cable + others.

THE AUDIO SHOP, Coffee Tavern Court, High St, Rushden. (0933) 56651. Tannoy, Mordaunt Short, Castle, Royd, B&W, Goodmans, Ion Systems, Audio Technica, QED, Rotel. Dem room. Ring for opening times.

## WEST MIDLANDS

SOUND ADVICE, 162 Alcester Road, Moseley, Birmingham B13 8HS. (021) 449 3328. A&R, Creek, Linn, Epos, Mission Cyrus, Naim, Rega, Roksan, Rotel, Yamaha. Tues-Sat 9.30-6. BADA MEMBER

ALTERNATIVE AUDIO LTD, 93-95 Hobs Moat Rd, Solihull. (021) 742 0254 (sales), 0248 (service). A&R, Audiolab, Denon, KEF, Marantz, Meridian, Mission, M.A., The Source, Philips. Tues-Sat 10-6, closed Mon. Home trial facilities, 3 dem rooms, free installation, instant credit. Access, Visa, Amex. Service dept. BADA MEMBER

FIVEWAYS HI-FIDELITY LTD, 12 Islington Row, Edgbaston, Birmingham. (021) 455 0667. A&R, Denon, Dual, KEF, Meridian, Musical Fidelity, Nakamichi, Philips CD, Quad, Revox, etc. Dem and home trial facilities. Tues-Sat 9.30-6. Free installation, credit facilities. Access, Visa. Service dept.

GRIFFIN AUDIO LTD, 94 Bristol St, Birmingham. (021) 692 1359. Linn, Naim Audio, Rega, Creek, Denon, Nakamichi, Quad, Mission, Monitor Audio, Rotel. BADA MEMBER

HI-FI EXCELLENCE, 163 Medieval Spon St, Coventry. (0203) 525200. Linn, Musical Fidelity, Quad, Mission, Cyrus, Denon, A&R Cambridge, Rotel, NAD, Nakamichi etc. Three floors of carefully selected hi-fi amidst the eloquence of our 14th century showroom. Dem, home trial and credit facilities. Access, Visa, Diners, Am. Exp. Mon-Sat 9.30-5.30. Closed Thurs. BADA MEMBER

HORTON ELECTRONICS (1987) LTD, 8-9 Lower Temple St, Birmingham B2 4JD. (021) 643 0972. Aiwa, Dual, Marantz, Goodmans, JVC, Mission, Sony, Technics, Wharfedale, Sennheiser. Dem facilities. Credit to £1000. Access, Visa. 9-5.30 Mon-Sat. Service dept.

RICHERSOUNDS 2, 12 Smallbrook Queensway, Birmingham B5 4EN. (021) 643 6664. Popular esoteric hi-fi for

upgrades, monthly special offers. Dem facilities, expert advice, free local delivery/installation (£500+), 2 Yr G'tee. Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard. Service Dept.

RICHERSOUNDS, 10 Smallbrook Queensway, Birmingham B5 4EN. (021) 643 1516. An A-Z of affordable, popular hi-fi; no-frills environment. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard. Service Dept.

## OXFORDSHIRE

ABSOLUTE SOUND AND VIDEO, 19 Old High St, Headington, Oxford. (0865) 65961. A&R, Denon, Linn, Mission, NAD, Rotel, Yamaha. Also 256, Banbury Rd, Summertown. BADA MEMBER

ASTLEY AUDIO LTD, 3 Marketplace, Wallingford. (0491) 39305/34349. AR, Dual, Kenwood, Mordaunt-Short, Mission, Monitor Audio, Philips, Technics, Tannoy, Yamaha. Tues-Fri 9-5.30, Sat 9-5. Records, tapes, 1000+ CD's. Service Dept. Access, Visa, Diners.

WESTWOOD AND MASON, 46 George St, Oxford. (0865) 247783. Linn, Naim, Rega, A&R, Heybrook, Dual, Mordaunt-Short, Spendor, Tannoy, Quad, etc. BADA MEMBER

WITNEY AUDIO, 28 High St, Witney, Oxford. (0993) 2414. A&R, Aiwa, Akai, Dual, KEF, Mordaunt-Short, Pioneer, Philips, Sony, Yamaha. Dem facilities. Mon-Sat 9-5.30. Free installation, credit to £1,000. Access, Visa. Service dept.

## SHROPSHIRE

AVON HI-FI Ltd, 12 Barker St, Shrewsbury. (0743) 55166. A&R, B&W, JBL, Dual, NAD, Nakamichi, Revolver, Trio, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9-5.30, closed Thur. Free installation, credit to £1,000. Access, Visa. Service dept.

MID SHROPSHIRE AUDIO, 24 Pevenilly Bank, Dawley, Telford. (0952) 502828. Ex-dem and used hi-fi equipment - including Ariston, Autophon, Helius, Incatech, Ion Systems, Michelle, Monster Cable, Ross, Ruark, Sansui. 6 months guarantee. Appts req'd. Home trial and free installation. Service dept. 7 days a week.

CREATIVE AUDIO, 9 Dogpole Lane, 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. (0293) 33655. Pink Triangle, Voyd Valdi, Marantz, Audio File, Systemdek, Audio Innovations, Cambridge, Quad, Rotel, Snell, etc. 2 dem rooms - no appointment req'd. Mon, Tues, Thurs, Fri, Sat. 9-6 Wed 9-1. Free installation. Credit facilities. Visa, Access. Service dept.

## 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

## SURREY

AERCO LTD, 11 The Broadway, Woking. (04862) 4667. A&R, Ariston, Exposure, HK, A.R., Heybrook, JBL, KEF, Magnum, NAD, Pt. Quad, Revox. BADA MEMBER

ROGERS HI-FI, 13 Bridge Street, Guildford (0483) 61049. Ariston, Acoustic Research, Akai, Denon, JPW, Mordaunt-Short, Marantz, Onkyo, QED, Tannoy etc. Mon-Sat 9.30-6. Dem. facilities. Instant Credit. Access, Visa. Service dept.

SURBITON PARK RADIO, 48 Surbiton Rd, Kingston-Upon-Thames, Surrey. (01) 546 5549. Quad, Dual, Denon, Kenwood, Nakamichi, Rotel, Pioneer, QED, B&W, Tannoy, Mordaunt Short, Castle, KBL. Dem and home trial facilities. Access, Visa. 9.30-5.00 Tues-Sat. Service dept.

TRU-FI SOUND AND VISION, 2 Cromwell Rd, Redhill, Surrey. (0737) 66128. Akai, Aiwa, Band 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.

## SUSSEX (EAST)

DEFINITIVE AUDIO, 30 Islingwood Street, Brighton, East Sussex BN2 2UR. (0273) 672796. Voyd, Systemdek, Helius, Audio Note, Sugden, JPW, Snell, Marantz, Denon, Rotel, etc. Wed-Sat 11-7. Home dems throughout Sussex. Credit facilities. Visa.

JEFFRIES HI-FI, 69 London Rd, Brighton, East Sussex. (0273) 609 431. 2 dem rooms, closed Mon, late night Wed.

Parking, bus route. Credit facilities.

BADA MEMBER

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

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, Dual, JVC, KEF, Nakamichi, Philips, Shure, Quad, Sony, Technics. 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, 40 Little London, Chichester PO19 1PL. Tel: (0243) 776402. Linn, Naim, Rega, Creek, Nakamichi, A&R, Denon, Roksan, etc. Tues-Sat, 10-1, 2-5.15 (closed Mon). BADA MEMBER

## TYNE & WEAR

RED RADIO SHOP AND HI-FI CENTRE, 11 Olive St, (Off Park Lane) Sunderland (Sunderland) 5672087. Aiwa, Bose, Denon, JVC, Luxman, Michell, Pickering, Spendor, Thorens, Trio. Dem facilities. Mon-Sat 9-5.30. Free installation, interest free credit. Visa. Service dept.

LINTONE AUDIO LTD, 7-11 Park Lane, Gateshead. (091) 477 4167. Linn, Naim, Rega, Musical Fidelity, Audio Lab, Quad, Cyrus, Denon, NAD, plus all leading Japanese manufacturers. Dem and home trial facilities. Free installation. Access, Visa, Amex, Diners. Credit to £1000. 9-6 Mon-Sat. Service dept.

## WILTSHIRE

ABSOLUTE SOUND AND VIDEO, 60 Fleet Street, Swindon. (0793) 38222. A&R, Denon, Dual, Linn, Meridian, NAD, Rotel, Technics, Yamaha. (Closed Wed).

BADA MEMBER

PR SOUNDS, 5 King St, Melksham (0225) 708045. Pioneer, Akai, JVC, Dual, Ortofon, Philips, Toshiba, B&W, Celestion. Mon-Sat 9-6. Dem and home trial facilities, free installation. Credit to £1,000. Access. Service dept.

## YORKSHIRE (NORTH)

ELITE HI-FI, 178 Kings Road, Harrogate HG1 5JG (0423) 521 831. Voyd, Elite Rock, Systemdek, Celestion, Helius, Audionote, Snell Acoustics, JPW, Nakamichi, Teac. 2 dem rooms. 7 days a week 9-6. Free installation. Service dept.

THE AUDIO CLINIC, 2A Brunswick St, Bishopthorpe Rd, York YO2 1ED. (0904) 646309. ADC, Allison, Hafner, JPW, Luxman, Proton, Quart, Studio Power, Systemdek, Thorens and more. Second hand hi-fi available. Appt's req'd, home trial and dem facilities. Free installation. Access and Visa. 10-5 Mon-Sat. Service dept.

THE SOUND ORGANISATION, 36 Gillygate, York. (0904) 27108. Linn, Naim, Rega, Roksan, Epos, Ruark, Gale, Denon, Rotel, Mantra. Tues-Sat 10-6. BADA MEMBER

RICHERSOUNDS, 6 Feasegate, York YO1 2SQ. (0904) 645535. Probably the smallest hi-fi store in York; but stocks the A-Z popular budget hi-fi at special discount prices. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

## YORKSHIRE (SOUTH)

MOORGATE ACOUSTICS Ltd, 2 Westgate, Rotherham S60 1AP. (0709) 370666. South Yorkshire's leading specialist hi-fi dealer. Roksan, Meridian, Mission, Quad, Musical Fidelity, Rogers, Beard, Bryston etc. Single speaker dem facilities. BADA MEMBER

## 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 2.30-5.30. BADA MEMBER

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

HUDDERSFIELD HI-FI CENTRE, 4 Cross Church St, Huddersfield. (0484) 544668. B&W Loudspeakers, Kenwood, Denon, Dual, A&R Cambridge, Musical Fidelity, Quad, NVA, Audio Lab, Philips, etc. Dem facilities - appointment req'd. 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

RICHERSOUNDS, 55 The Headrow, Leeds LS1 6LR. (0532) 455717. Affordable special deals on every big budget line from Akai to Yamaha; separates & systems. City centre store opposite Lewis's. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-

# SELECTED DEALER DIRECTORY

5. Access, Visa, Richer ChargeCard.  
**SELECTIVE AUDIO**, The Forge Cottage, 19 Crossgate, Otley. (0943) 467689. Exclusively handles Alphason, Roksan, NVA, ProAc in the area and other minimalist British designer products for the discerning listener. Dem facility. Member of the Cognoscenti. Mon-Sat 10-6.

## IRELAND

**CLONEY AUDIO**, 34 Main St, Blackrock, Co. Dublin. 0001 889449. Linn, Naim, Roksan, Rega, Rogers, Spendor, Musical Fidelity, Cambridge Audio, Accoustat. Tues-Sat 10-6, Thurs & Fri til 9. Free installation. Visa, Access. Service dept.

## SCOTLAND

### EDINBURGH

**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.  
**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 48 page Hi-fi Guide and monthly Newsletters; mail order; part

exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

### GLASGOW

**BILL HUTCHINSON Ltd**, 43 Hope Street, Glasgow. (041) 248 2857. AR, Aiwa, Denon, Dual, JVC, Mission, Mordaunt-Short, Omar, Technics, Yamaha etc. Dem facilities. Mon-Sat 10-6. Free installation, instant credit. Access, Visa. Service dept.  
**RICHER SOUNDS**, 24 Gordon St, Glasgow G1 3PU. (041) 221 9147. The affordable hi-fi alphabet in an unpretentious atmosphere; regular special offers. Facilities: expert advice; free 48 page Hi-fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.  
**STEREO STEREO**, 278 St. Vincent St, Glasgow G2 5RL. (041) 243 4079. Linn, Naim, Rega, A&R, Aiwa, Denon, Dual, Epos, Heybrook, Mission, QED, Rotel, etc. BADA MEMBER 

### 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 

### WALES

### CLWYD

**ACTON GATE AUDIO**, 4 Ruabon Road, Wrexham. (0978)

364500. Quad, Rotel, NAD, Onkyo, AR, B&W, Sansui, Revolver, Castle, Target. Mon-Sat 9.30-5.30, closed Wed. Dem and home trial facilities. Free installation. Full credit. Access, Amex. Service dept.

### 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 48 page Hi-fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

### GWENT

**A. E. HUGHES & SONSLTD**, 28 Clarence Place, Newport. (10633) 58851. Bang & Olufsen, Kenwood, Mordaunt-Short, Roberts Radio, Dynatron, Mitsubishi, Sheraton. Cabinets plus audio accessories. Dem and home facilities. Free installation. Access and Visa. 9-12.45, 2.15-5.30 Mon-Sat. Service dept.

# ARJAY

**ST2**  
 Holds 480 records  
 price £154.00

**ST1**  
 Holds 600 records  
 price £183.00

**ST5**  
 Holds 120 records  
 price £48.00

**ST4**  
 Holds 240 records  
 price £92.00

**ST3**  
 Holds 360 records  
 price £125.00

All prices are ex-works and inclusive of VAT.

## The Professional Sound Storage System Direct from the Manufacturer

Whether your collection is Records, Cassettes or CDs the **ARJAY** system is just for you. In fact, in many music studios, stores and libraries throughout the country **ARJAY** is considered essential equipment.

Its classic and original design makes the best possible use of available space to provide the ideal storage and display conditions.

You have a choice of the "Record Collection" which consists of five different sized units, designed specifically for record only collections or "The Combination" which has three different sized units, designed for a mixed collection of Records, Tapes & Compact discs. There is a unit just right for you.

The **ARJAY** System is British made and is available in a choice of five functional finishes - **Rosewood, Mahogany, Teak, Black or White** - to look good wherever you choose to keep them.

You couldn't put your music collection in better hands or units.

Contact Sandra on **01-390 2101** or send coupon below to:-

**ARJAY Ltd.**  
 54 Lower Marsh Lane, Kingston, Surrey KT1 3BJ

Please send me The **ARJAY** Sound Storage System brochure.

Name .....

Address .....

..... Tel No .....

setting the standard in loudspeakers . . .

**PROS**

BRITISH  HIGH FIDELITY

310 COMMONSIDE EAST, MITCHAM, SURREY CR4 1HX 01 640 2172

# BACK ISSUES

# HI-FI CHOICE

## TO ORDER BACK ISSUES:

Please tick issues you require

CD Midi Systems (Special Ed.)	Nov 86 <input type="checkbox"/>
Turntables, Arms, Cartridges (48)	Dec 86 <input type="checkbox"/>
The Best Buy Guide (Special Ed.)	Oct 87 <input type="checkbox"/>
Amplifiers & Tuners (50)	April 87 <input type="checkbox"/>
Compact Disc Players (51)	June 87 <input type="checkbox"/>
Cassette Decks & Tapes (52)	Aug 87 <input type="checkbox"/>
Loudspeakers (53)	Dec 87 <input type="checkbox"/>
CD Based Midi Systems (54)	Jan 88 <input type="checkbox"/>
Turntables & Arms (55)	Feb 88 <input type="checkbox"/>
Amplifiers (56)	March 88 <input type="checkbox"/>
Cassette Decks (57)	April 88 <input type="checkbox"/>
CD Players (58)	May 88 <input type="checkbox"/>
Loudspeakers (59)	June 88 <input type="checkbox"/>
The Collection (60)	July 88 <input type="checkbox"/>
One-Name Systems (61)	Aug 88 <input type="checkbox"/>
Amplifiers (62)	Sept 88 <input type="checkbox"/>
Cassette Decks (63)	Oct 88 <input type="checkbox"/>
Compact Disc Players (64) (inc. free CD)	Nov 88 <input type="checkbox"/>
CD Midi Systems (65)	Dec 88 <input type="checkbox"/>
Loudspeakers (66)	Jan 89 <input type="checkbox"/>

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

## PAYMENT

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

Please charge my Access/Barclaycard/American Express/  
Diners Mastercharge (delete as appropriate)

Credit card number \_\_\_\_\_

Expiry date \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

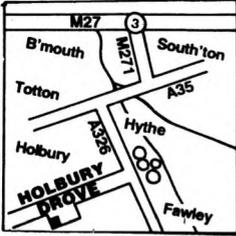
Address \_\_\_\_\_

Postcode \_\_\_\_\_  
(67)

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

# DEALER GUIDE

## SOUNDWAVES



- HOME INSTALLATIONS
- HOME DEMONSTRATIONS
- INTEREST FREE CREDIT
- 3 YEAR GUARANTEE
- MORDAUNT-SHORT
- SOUND ORGANISATION
- TRIPOD SYSTEM
- NAIM
- REVOLVER
- LINN
- ROKSAN
- EXPOSURE
- EPOS
- ROYD
- CREEK
- A&R
- HEYBROOK
- DENON

Open 10am-6pm. Thurs 10am-8pm  
Closed Sundays & Mondays

1 HOLBURY DROVE PRECINCT  
HOLBURY NR FAWLEY HANTS  
TEL: 0703 899131

## ASHTON AUDIO VISUAL SPECIALISTS

TARGE, RUARK, THORENS, ARISTON, WHARFEDALE, TDK, THAT'S, SONY, ROBERTS, CELESTION, MORDAUNT-SHORT, TANNOY, KENWOODJVC, TOSHIBA, JBL, LINX, MONSTER CABLE, VAN DEN HUL, DENON, MARANTZ, PROTON, NAD, ROTEL, AR, NAKAMICHI, INCATACH, QUAD

6 HIGH STREET SOUTH, DUNSTABLE, BEDFORDSHIRE.  
TEL: 0582 608003

Diner's Club - American Express - Visa - and Credit Brokers  
Open Monday to Saturday 9.00am - 5.30pm (6 on Fridays)

## 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



ROTEL



DENON



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 care about hi-fi

## hi-fi bargains for cash

New and used equipment



## REVOX

NAKAMICHI, QUAD, SONY INC ES,  
Technics, Harmon Kardon, Teac, Lux, Bose, JBL, Tannoy,  
AR, T&A (sonab), Mordaunt-Short, Marantz, Philips.

Your old equipment can be taken in part exchange

## the hi-fi centre

Green Lane, Wilmslow, Cheshire SK9 1LW  
(0625) 524766/522112

Closed Wednesdays except by appointment

## AUDIO VENUUE

24 CHURCH ROAD, CRYSTAL PALACE, LONDON SE19 2ET  
TEL: 01-771 7787

Stockists of: Linn Hi-Fi, Naim Audio, Creek, A&R, Denon, Dual,  
Revolver, Marantz, BLQ, Yamaha, etc.

2 single speaker demonstration rooms, Instant Credit Facilities.

All equipment delivered & installed. Comprehensive urntable rebuilds etc.

Interest Free Credit. 2 year warranty.

Open 10-6pm - Closed all day Wednesday.



Hi-Fi Specialists

- A&R
- Castle
- Dual
- Mordaunt-Short
- Musical Fidelity
- B&W
- Denon
- Marantz
- Monitor Audio
- Nakamichi

- Pioneer
- Philips CD
- Quad
- Rogers
- Rotel
- Revox
- Sony
- Spondor
- Tannoy
- Technics
- Thorens
- Trio/Kenwood
- Yamaha
- Ariston etc.

Two-year guarantee  
Private listening room

Excellent comparator demonstrations

54 Chapel St., Chorley, Lancs.

Telephone (02572) 71935



AKG, AR, AIWA, A&R, AVANCE, ARISTON, ALPHASON, BEARD, B&W, BOSE, BEYER, CASTLE, CELESTION, CAMBRIDGE, DENON, DUAL, dbx, ELITE ROCK, HARMON KARDON, HEYBROOK, INCA TECH, INFINITY, KEF, KENWOOD, LUXMAN, MARANTZ, MONITOR AUDIO, MICHELL, MONSTER CABLE, MORDAUNT-SHORT, MUSICAL FIDELITY, MYST, NAD, NAKAMICHI, NAGAOKA, PMB, ONKYO, PIONEER, PHILIPS (CD), QED, QUAD, REVOLVER, REVOX, ROKSAN, ROTEL, RUARK, SOUNDEX, SPENDOR, SANSUI, STAX, SENNHEISER, TANNOY, TARGET, TEAC, THORENS, VdH, WHARFEDALE, YAMAHA.

- LATE NIGHT THURSDAY • INSTANT CREDIT UP TO £1,000
- MAIL AND TELEPHONE ORDERS WELCOME
- ACCESS, BARCLAYCARD, AMEX, DINERS CLUB.

45 HIGH STREET, HOUNSLOW, MIDDLESEX  
TEL: 01-570 7512

# DEALER GUIDE

A & R, Creek, **B&W**, Nakamichi, Heybrook,  
Dual, Linn, Meridian, Quad, Philips, Teac  
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

## SHROPSHIRE HI-FI THE HI-FI SPECIALIST

ARISTON, AUDIO TECHNICA, CAMBRIDGE AUDIO, CELEF,  
DENON, DUAL, HEYBROOK, INFINITY, MANTRA,  
MORDAUNT SHORT, MUSICAL FIDELITY, MONITOR AUDIO,  
MARANTZ, PROAC, QED, ROTEL, TARGET, TEAC, ETC.  
TANNOY, ROKSAN

Demonstration Room, Free Parking, Free Installation, Repairs

CLOSED THURSDAY

SHROPSHIRE HI-FI, ST. MICHAEL'S STREET,  
SHREWSBURY 0743 232317

SMC GROUP

## Analog Audio

First Class Separates from  
AR, Denon, Dual, Harmon/Kardon,  
Jamo, Kenwood, Luxman, Marantz,  
Mordaunt Short, NAD, Onkyo, Proton,  
Rotel, Teac, Thorens, Tannoy, Yamaha

FULL DEMONSTRATION  
FACILITIES AVAILABLE

Access and Barclaycard Welcome.

**ANALOG AUDIO**  
849 HIGH RD., LONDON N12. 01-445 3267

**Peter TYSON** 

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 and Philips.

"Demonstration Facilities" "Part Exchange Welcome"

"Free Delivery & Installation" Access & Visa accepted  
"Cumbria's Premiere Hi-Fi Centre"

**B&W** 

STOCKISTS OF JVC,  
ARISTON, CASTLE,  
STUDIO POWER SPEAKERS

**Dual**

*PP Sounds*

5 KING STREET, MELKSHAM, WILTSHIRE  
TELEPHONE: 0225 708045

**AKAI**

**PIONEER**  
The future of sound and vision.

**DENON**

## Hi-Fi Sounding Out of Tune?

Turntable Resetting

P.W.B. Treatments

Cassette Deck Re-biasing

System Attuning Home Installations

Home Visits call Robert King

01 274 8081

BCM SYSTEMS

LONDON WC1N 3XX



*The  
Sound  
Shop*

58 THE BROADWAY, MILL HILL,  
LONDON NW7 3TE Tel: 906-3364/3680

Sound Advice, Sound Equipment, Sound Deals

### DEMONSTRATION

APPOINTMENTS NOT NECESSARY, BUT BOOKABLE IN ADVANCE UNTIL 9PM.

### INSTALLATION

FREE LOCAL DELIVERY.

### SERVICE

IN STORE SERVICE DEPARTMENT WITH FULL UP TO DATE FACILITIES.

### MAIL ORDER

SEND YOUR CHEQUE WITH YOUR NAME & ADDRESS AND GOODS REQUIRED, OR  
PHONE QUOTING YOUR CREDIT CARD NUMBER.

### STOCKISTS OF:

AIWA, A.R, ARISTON, B&W, BLO, BOSE, CASTLE, DENON, DUAL, FOUNDATION,  
GOODMANS, HARMAN-KARDON, JBL, KENWOOD, MARANTZ, MONITOR AUDIO,  
MAXELL, MORDAUNT-SHORT, MUSICAL FIDELITY, NAD, NAKAMICHI, ONKYO,  
PIONEER, PROTON, QUART, REVOX, RUARK, REVOLVER, SANSUI, SENNHEISER,  
TANNOY, TARGET, THATS, THORENS, VAN DEN HUL, WHARFEDALE, QED, NVA,  
SD ACOUSTICS, KUZMA, TOWNSEND, SYSTEMDEKS, ORELL & ROKSAN

## Active Audio

sound systems

■ Aiwa ■ AR ■ A&R Cambridge ■ Ariston ■ Bose ■ Celestion  
■ Denon ■ Elite ■ Heybrook ■ KEF ■ Marantz ■ Mission Cyrus  
■ Monitor Audio ■ Musical Fidelity ■ NAD ■ Onkyo ■ Pioneer  
■ Rotel ■ Revox ■ Rogers ■ Sansui ■ Wharfedale ■ Yamaha

### BRANCHES IN DERBY & TAMWORTH

Active Audio  
12 Osmaston Rd  
The Spot  
Derby  
☎ 0332-380385

**BADA**

Active Audio  
29 Market St  
Tamworth  
Staffs  
☎ 0827 53355

# 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. At present this runs to some 700 plus products 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 Aristo *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 *R*s and *BB*s denoting the Recommended and Best Buy ratings that are appended to products we consider meritworthy. The Best Buy tag means that a product not only offers good sound quality but is reasonably priced as well. With source components a price

limit of approximately £300 is usually used as a guide. Recommended means that either the performance of a product is particularly good irrespective of price or, alternatively that a good value standard is achieved but overall attainment falls short of Best Buy classification. An ideal situation would be to choose suitably priced Best Buy or Recommended products from relevant categories and create a Best Buy system; but, due to the variety in tonal balance that exists in much audio equipment (especially the electromechanical elements – ie cartridge and speaker) system building is not quite that simple. These ratings make a useful guideline for shortlisting components, but only experiencing the actual combination will tell you whether it works for you.

The final column contains a reference to the issue of *Hi-Fi Choice* which featured the complete review. If you wish to get a better idea of a product by reading the complete review it is possible to order a copy (if still in print) through our back issues department. Every *Choice* issue contains a Back Issues page for this purpose.

The Directory is constantly updated with the latest reviews and price changes as well as having discontinued products removed. If a listed product is updated to a 'mark two' form and the alterations are purely cosmetic 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 separate route still have lingering doubts – usually completely unjustified – over the compatibility of components from different manufacturers. Gross incompatibilities are very rare nowadays, only likely to rear their heads amongst the most exotic components. Here the delicate art of 'supercompatibility' really takes over the major role and might be regarded as the key to 'real' hi-fi.

There are now three different pre-recorded music media competing for the attention of the hi-fi user, and to go for all three will either cost a lot of money or involve substantial compromises in the sound quality of each. For this reason many separate 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 separate 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 dealer's before taking the plunge. Because tastes inevitably differ it would be unwise to buy purely on the basis of our recommendation and dealers are the most experienced people around when it comes to making systems work as a whole.

# THE DIRECTORY

## TURNTABLES & TONEARMS

The schizophrenic split between consumer electronics and 'real hi-fi' is most obvious amongst turntables. The former are supplied simply as a means of playing vinyl in a system context. Cheaply manufactured in the Far East, these are complete players with a variety of automatic facilities, sometimes tied into system remote control. But engineering compromises severely limit sound quality, cartridge choice may be P-mount restricted, and such machines are rarely stocked by specialist hi-fi dealers these days.

Specialist turntables offer big sound quality

improvements, but lack so-called convenience features (that practised users often find irksome). Such turntables at the cheaper end of the market (sub-£350) tend to be supplied with matching tonearm, and often include a 'starter' cartridge. Still better quality is found at higher prices amongst the separate motor units and tonearms. Careful partnering and set-up is essential for these individual components, but 'naturally sympathetic' combinations do exist, and the good dealer can help.

Listed separately as integrated players and as turntable motor units and tonearms, our **sound**

**quality** rating is based on results achieved using a high quality system – but in point of fact the turntable is usually the limiting factor soundwise in any system. **Lab performance** summarises the speed stability, vibration generation and environmental isolation of turntables, along with the friction, alignment and adjustment of tonearms. The tonearm's physical characteristics also define a range of mechanically compatible cartridges (see cartridge listings).

### INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
<b>Acoustic Research EB101</b> £230	Good Good	This genuine high fidelity product offers an impressive package at a competitive price	Subchassis, manual, 13.5g	BB	48
<b>Alphason Solo/Xenon MCS</b> £365/£262	Average + Good	The deck is warm and euphonious with high levels of clarity. Wow artefacts occasionally just audible	3 point suspended motor unit, optional quartz PSU/speed change 13g		This
<b>Alphason Sonata/HR-100S-MCS</b> £695/£412	Excellent Very Good	Highly capable audiophile system with real resolution and control. Bass is powerful and dynamic ability unbridled	Manual, subchassis, belt drive, 10g	R	60
<b>Ariston Q-Deck</b> £150	Good Average +	Well engineered and good sounding low cost package which is both easy to set up and to use	Semi-auto, belt drive, solid	BB	This
<b>Ariston RD60</b> £219	Good Good	With the Enigma arm, this balanced and communicative turntable falls only slightly short of the RD90 on sound quality	Manual, belt drive, subchassis, 11.5g	BB	48
<b>Ariston Forte</b> £350	Below Average Average	Heavy on engineering, short of soul? The Forte almost makes it, losing out only because of some residual pitch variations and a lack of bass power. The arm is modestly good	Manual 2-speed belt drive player and detachable arm, 10g		This
<b>Dual CS430</b> £89	Average Below Average	Ragged, sometimes unpleasant cartridge mixes with a modest pleasing player in a very sharply priced package	Belt drive, with cartridge, auto return, 5g	R	This
<b>Dual CS503-1</b> £114	Poor Average	Slated as a replacement for the CS505, the 503-1 needs careful system matching to mask rumble and microphony, but is good enough to benefit from a better cartridge	Semi auto, belt drive, low mass arm	R	55
<b>Dual CS505-3</b> £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	This
<b>Dual CS5000</b> £200	Average Average +	The rare 78 facility may give grandma's collection a new lease of life but the player did not merit recommendation on price vs sound	Electronic, belt drive, subchassis, 10g		48
<b>Goldmund ST4</b> £4,000	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
<b>Heybrook TT2 turntable &amp; arm</b> £349/£249	Average Good +	A gradual process of informed evolution and a sensibly designed arm combine to make this a good sounding middle of the road package. Well supported by dealers	Manual subchassis motor with arm, belt drive, 14g	R	This
<b>JVC AL-FQ555</b> £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		This
<b>Kenwood OP-990</b> £300	Average Average	Smart, slick and massive player suitable for low compliance cartridges only. A good but not inspired performer	Semi-auto 2 speed direct drive, 16g		This
<b>Kuzma Stabi/Stogi</b> £575/£349	Average + Stabi: Good; Stogi: Excellent	Stabi is powerful, spacious but not sufficiently subtle. Stogi is an excellent all rounder with even spread of abilities	Manual, belt drive, subchassis 12.5g	Stogi: R	60
<b>Linn Axis</b> £345	Good + Good +	Setting new performance-for-price standards this cleverly engineered and competent deck has many of the qualities of the Sondek LP12	Electronic, belt drive, semi subchassis, 13g	BB	48/Coil
<b>Linn Sondek/Ittok (Troika)</b> £509/£429 (£625)	Excellent Excellent	Superb sound – the best LP12 combination yet. The Troika gives the system real solidity and strength, stretching the deck and arm qualities to the full	Manual subchassis player, belt drive, 14g	R	60
<b>Manlicore Mantra</b> £300/£330 (Arm)	Good + Good +	Fitted with a Rega RB250 arm variant and AT95E cartridge the Mantra fared very well indeed with a fine midrange and good focus	Subchassis, 12g, manual	BB	48/Coil
<b>NAD5120</b> £89	Average Average	A number of running improvements have given this player a range and tautness denied its lazier sounding antecedents	Semi-auto belt drive, detachable arm/tube/weight, 9g	BB	This
<b>Omega Point Silver/Black</b> £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
<b>Opus 3/Decca London International (Revised)</b> £399/£99	Poor Good	Heavyweight motor unit with many fine properties, but which needs further development. The idiosyncratic arm is a suitable (though not ideal) platform for the Decca cartridge. For all its faults though, the whole transcends the sum of the parts	Belt-drive manual, damped unipivot arm, 12g		This
<b>Rega Planar 2</b> £135	Average + Good	A remarkable product at the price, surprisingly articulate and confident	Integrated turntable, manual, 11.5g	BB	48
<b>Rega Planar 3</b> £188	Good Good	A long time leader in its price category, the '3' (with its excellent RB300 arm) sounded nicely 'musical' in a balanced and coherent manner	Integrated turntable, manual, 11.5g	BB	48
<b>Revolver Rebel</b> £160	Below Average Below Average	Fat, assured and forward presentation, but ragged and subjective speed stability problems. With a little further development, it will be a winner	Manual, 2-speed belt drive inc cartridge, 13g		This
<b>Revox B291</b> £660	Average – Average –	Sound quality ranks as below average. Subjective bandwidth is narrow and the music lacks grace and energy. Ease of use however is unrivalled	Automatic, remote controllable, direct drive parallel arm, preflitted cartridge		55
<b>Sansui SR-222 Mk V</b> £159	Average – Average	More than acceptable in most areas, the Sansui is detailed and positive, though a little muddled when stressed. Best suited to low compliance cartridges	Manual 2-speed belt drive, 16g		This

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127

# DEALER GUIDE

## MANDERS HI-FI LTD

For Nakamichi, Quad, Dual, Hafler, Luxman, Denon, Revox, Sansui, Harman-Kardon, A+R, Thorens, QED, Spondor, Monitor Audio, Rotel, Ariston, Revolver, Technics etc.

2 Edward St, Grimsby,  
Humberside  
0472-351391

## MURRAY HI FI FOR REAL SOUND



marantz

REGA, DUAL, REVOX, ROTEL, ROYD,  
MONITOR AUDIO AND MANY OTHERS.

103a BEVERLEY ROAD, HULL  
HUMBERSIDE HU3 1RX  
TEL: 0482 227867

19 MIDDLE HILLGATE, STOCKPORT  
CHESHIRE SK1 3AY  
TEL: 061 429 7666

## Hastings Hi-Fi CONSULTANTS

32 WESTERN ROAD, ST. LEONARDS. (0424) 442975.

Selected Hi-fi  
from - EXPOSURE, MUSICAL FIDELITY,  
QUAD, NAKAMICHI, HARMAN KARDON,  
MONITOR AUDIO, ROGERS, TANNOY, CYRUS,  
NAD, REVOLVER, MANTICORE, GALE,  
MARANTZ, ROKSAN, ELITE, AUDIOLAB,  
CELESTION, HEYBROOK,  
& Many more.

- OPEN TUES-SAT 9.00-6.00
- FULL DEMONSTRATIONS - IN STORE & IN HOME

## 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, Spondor, Tannoy

40 Little London, Chichester, W. Sussex  
Telephone 0243 776402  
(Closed all day Monday)



DOUGLAS SHOP  
NOW OPEN  
ON LOCH  
PROMENADE

0624-815521

ISLAND COMPACT DISC & HI-FI CENTRE

• WHARFEDALE • A&R CAMBRIDGE •  
• SUGDEN • CELESTION •  
• TEAC • PHILIPS •  
• A&R • JBL •  
• LUXMAN • HARMON KARDON •  
• BEYER DYNAMICS • MUSICAL FIDELITY •  
• MICHELL • ARISTON •

TEL: (0624) 815521

PARLIAMENT SQUARE  
RAMSEY,  
ISLE OF MAN

OPENING TIMES MON-SAT 9-5-00PM

DEM FACILITIES

## SHROPSHIRE'S HI-FI CENTRE!

Quad  
B&W  
Kenwood  
JVC  
Celestion  
NAD  
Onkyo  
A&R  
Nakamichi  
Beyer Dynamic  
Dual

AVON Hi-Fi Limited

12 Barker Street, Shrewsbury (0743) 55166

## JOHN MARLEY HI FI CENTRES

DOVER AND CANTERBURY

Stockists of :- QUAD, HEYBROOK, ROTEL, CELEF,  
DENON, ARISTON, SANSUI, PINK TRIANGLE, PIONEER,  
PRO-AC, A & R, TECHNICS, B & W, CELESTION,  
TANNOY, REVOLVER, MORDAUNT SHORT,  
GOODMANS, MUSICAL FIDELITY, AND OTHERS

SINGLE SPEAKER DEMONSTRATION ROOM  
HP AND PART EXCHANGE  
REPAIRS IN OUR OWN WORKSHOP

0304 207562 AND 0227 69329  
43 HIGH STREET 2 STATION ROAD WEST  
DOVER CANTERBURY

## AUDIOSCENE

QUALITY HI-FIDELITY  
SOME OF THE FAMOUS NAMES L

CHESTERFIELD

MUSICAL FIDELITY : INCATECH :  
RUARK : CELESTION : GALE :  
MARANTZ : ROTEL : KENWOOD :  
SME : MOTH : EPOS : SPICA :

D.N.M. : ALPHASON : REVOLVER :  
MISSION : NAD : DENON : I.T.L. :  
PINK TRIANGLE : DUAL : ROCK :  
CAMBRIDGE : AT : PHILIPS CD :



CHATSWORTH ROAD, BRAMPTON  
CHESTERFIELD  
TELEPHONE: 204005



# THE DIRECTORY

## INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Source/Odyssey RP1 £849/£695	Very Good	Mixed. The turntable has tremendous power and authority, but as tested suffered pitch imprecision. The arm is rather ill controlled and lacks resolution and focus.	Manual, belt drive, subchassis, motor, outboard PSU, 15g		55
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	This
Technics SLBD-22 £90	Average — Average —	Not bad for the price and a great improvement on the L20, it performs reasonably when not stretched.	Semi automatic, solid plinth, electronic, 6g P-mount	R	48
Technics SL-DD33 £110	Average Average	As with the QD33 though better value.	Automatic, direct drive, solid plinth, 7.5g, P-mount	BB	48
Technics SL-L20 £115	Poor Average —	A rather lightweight parallel tracker achieving a poor overall rating, with little to recommend it unless you die facilities.	Electronic, solid plinth, 5g, P-mount		48
Technics SL-QD33 £140	Average Average	The quartz speed controlled version of the DD is short on sound quality but not features. But it did have fair focus and some depth.	Automatic, Quartz, direct drive, solid plinth, 7.5g, P-mount	R	48
Thorens TD280 £150	Average Average	Extremely competitively priced package with a trace of lower-mid overhang, but it's very well behaved elsewhere.	Semi-auto belt-drive 2-speed, 13g	BB	This
Thorens TD166 Mk II £179	Average Average +	A polished and professional design consisting of a first rate budget suspended subchassis turntable and a mildly disappointing arm.	Manual 2-speed, 13g	BB	This
Thorens 160S Mk IV £249	Average + Average +	Fine, familiar suspended player and arm. Faults are few, but include poor arm bearing adjustment. The arm can sound a little messy.	Manual 2-speed, 7g	R	This
Thorens TD320 Mk II £349	Good Good	Good, consistent sounding deck with much improved (but not ideal) arm. A little expensive for performance offered.	Semi-auto two speed belt drive, 14g		This
Well Tempered Turntable & Arm £1690	Average Very Good	Intriguing and challenging design. Musically it is not ideal, but it has a limpid quality and a lack of artificiality that sets standards as well as turning the ear, though it's not completely uncoloured. A charmer yet mainstream enough in its virtues to be viable.	Manual 2-speed, damped, suspended arm, 7.5g	R	This

## MOTOR UNITS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ariston RD90 Superior £900	Good + Good	Good but slightly damped sound quality, with powerful and stable bass. The pro quo is a certain lack of pace, energy and resolution.	Belt drive, subchassis, electronic		55
Audio Labor Konstant £2,560	Good + + Very Good	The space-station-like solid alloy frame needs a substantial shelf, but absolute stability renders a confident, neutral sound.	Belt drive, subchassis	R	48/Coil
Goldmund Studio £2,350	Very Good Excellent	A reference point for high end audio, only exceeded by the even more extravagant Reference. Currently being reworked into a more competitive (!) package.	Electronic, direct drive, solid subchassis	R	60
Michell Synchro £265	Good Good	A particularly happy blend of qualities endows the Synchro with a blend of subtlety and force – the mailed fist in the velvet glove. Easy on the ear in the best sense.	Manual, belt drive, suspended motor unit	R	This
Michell Gyrodec £595	Good Good	Sweet and natural sounding player, well exploited by the Rega RB300 arm. Aesthetics, and the acres of acrylic, are unique.	Manual, belt drive, suspended motor unit		55
NVA Turntable £499	Average Good	A surprisingly fast and assured performer, but with lightweight bass and a little aggressive. Easy to set up, the price (necessarily) includes stand.	Manual, belt drive subchassis, stand, 33 1/3rpm		60
Oracle Alexandria Mk III £825 – £995	Very Good Very Good	One of the most beautifully presented players made, and fully supported by superb separation, dynamics and a euphonious style of delivery.	Manual 2-speed belt drive	R	This
Oracle Delphi III £1450	Very Good Very Good	Stable imaging, good bass and refined detail, it's well made and consistent in service – but very expensive.	Manual, belt drive, subchassis	R	60
Oxford Acoustics Crystal Reference £1955	Very Good Excellent	This big, open and powerful sounding turntable works beautifully with Airtangent arm to give superb 3-D imagery.	Manual, belt drive, subchassis, stand	R	60
Pink Triangle PT 100 £650	Good Excellent	A state of the art player, easy to set up but extremely fussy about partnering equipment and state of tune. The test sample suffered flutter derived roughness (presumed not typical).	Manual 2-speed, outboard PSU	R	This
Rega Split Slab Modification Kit £74	Good Good	Clever and cheap upgrade kit that protects the initial investment and which adds clarity and environmental isolation to a fine but microphonic original.	Conversion suspended chassis kit for Rega 2/3		This
Roksan Xerxes £655	Excellent Excellent	This unique design cuts a swathe through the conventions of turntable design, providing superb resolution and stereo. Setting up is critical, and for experts only.	Manual, belt drive, solid/decoupled	R	This
SEE Revolver £135	Average Average	Nicely balanced, but unimpressive timing and lightweight bass made this deck rather average for the price. Manufacturer has since made several changes, but not re-submitted for review.	Manual, belt drive, solid plinth		48
Source So £675	Good Good +	Now an extremely tidy sounding deck, the So has a grip and range at low frequencies that knows few peers, and is at least sufficiently good elsewhere. A successfully refined version of a promising original that didn't quite deliver.	Manual belt-drive 2-speed, outboard PSU	R	This
Systemdek IIXE £248	Good Good	Fine, honestly specified and well built player which easily betters its closest stablemate, the IIX.	Manual 2-speed, external PSU	R	This
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	This
Thorens TD521 £629	Average Average +	Nice product, unexciting, rather undynamic and insubstantial sound quality, but facilities such as ability to accommodate 12 inch arm compensate.	Manual, belt, suspended motor unit, 78rpm, pitch control,		55
Townshend Avalon £299	Good Good	Some smear and coloration, probably due to structural shortcomings of the plinth, take the edge off this otherwise well turned out and well priced machine. Worth trying if you can't afford the full-blown Rock.	Manual 2-speed belt drive	R	This
Townshend Rock £450	Good Good + +	Tight, tidy sounding player which works with a wide variety of (non-tangential) arms, giving almost CD like precision and clarity. Good bass depth, dry balance – our Editor's favourite deck, in fact.	Manual, belt drive, solid, arm damping, various optional extras	R	55

## TONEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Airtangent II £1998	n/a Excellent	A complex but superbly built arm for high quality systems, giving excellent stereo and resolution.	7.5g (vertical)	R	60
Alphason Opal £110	Good Average	This is a straightforward adequate sounding low cost arm, priced just above where it rightly belongs.	10g		55
Alphason Delta £165	Good Average +	A highly competent design from Alphason gives good sound quality but with slight blurring and treble fizz.	16g	R	48
Alphason Xenon £210	Good Good +	A trimmed down HR100S, the Xenon has inferior bearings and a simpler finish, but sounds crisp and coherent. Fits any Linn cutout.	12.75g	R	55

# THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

# DEALER GUIDE

## BRYANTS

Bryants Hi-fi  
81 High Street,  
Aldershot,  
Hants.  
Tel: 0252-20728

• TV • VIDEO • HI-FI •

★ Full Demonstration Facilities ★

★ Single Speaker Listening Room ★

If we don't have it in stock we will obtain it for you at a generously discounted price.

**HI-FI MARKETS**

**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



**01-837-8741**



**CANAL BRIDGE  
AUDIO VISUAL**  
172 CALEDONIAN ROAD  
LONDON N1 0SG

## HOPKINS Hi-Fi

**THE SPECIALISTS**

*Stockists of:*

★ Technics ★ Quad ★ Denon ★ NAD ★ Yamaha ★ Acoustic Research ★ Bose ★ B+W ★ Celestion ★ Dual ★ Mordaunt-Short ★ JPL ★ Cambridge Audio ★ Onkyo ★ QED ★ Tannoy ★ Trio/Kenwood ★ Heybrook ★ Monitor Audio ★ Harman Kardon ★ Celest

Demonstration Lounge  
Fully qualified engineers on premises

**38-40 FRATTON ROAD, PORTSMOUTH,  
HANTS PO1 5BX. Tel: 0705 822155**  
Hi-fi Markets

## SOUND DECISION LTD

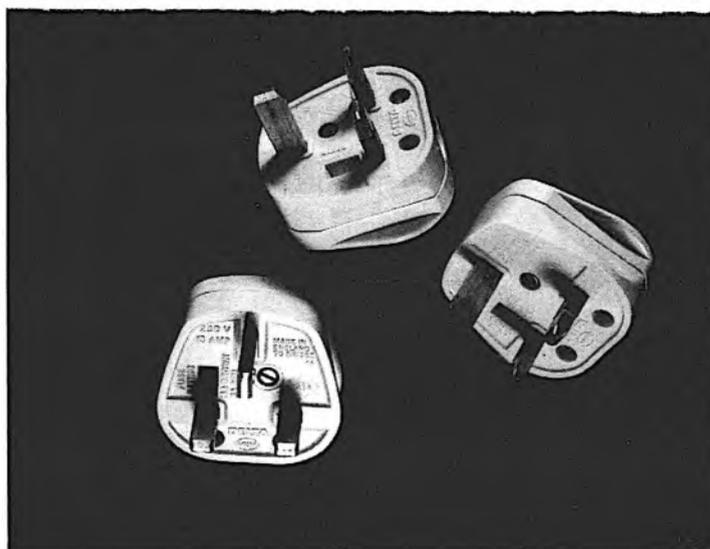
Retailers of fine quality Audio equipment

**Stockists include:**

- Audio Innovations • A&R Cambridge • DNM Design • Denon • Dual • Townshend International • Gale • Heybrook • KEF • Marantz • Mission • QED • RATA • Revolver • Rotel • Ruark • Snell • Musical Fidelity

**106 Harley Road, Sale, Cheshire M33 1FP**  
Telephone: 061 969 1074

## MAKE THE RIGHT CONNECTIONS



**GOLD-PLATED MAINS PLUGS & SOCKETS**

# INCA TECH

Unit 8, Charfleet House, Charfleet Road,  
Canvey Island, Essex SS8 0PQ  
Telephone: (0268) 680550

# THE DIRECTORY

## TONEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Alphason HR100S £395	Good + + Very Good	This S-shaped arm sounds smooth, but nevertheless reproduces transients with fine attack	10g	R	48/Coll
Ariston Enigma £99	Average Average +	Good but not the best in its class: mid-band sounds a little uneven; treble a trifle "brash"	11.5g		48
Audio Technica AT1130 £186	Good Good	Well suited to most cartridges including high compliance ones, the AT is smooth and tonally neutral, if slightly lacking in 'balls'	8.5g	R	This
Decca International £49	Average + Average +	This uni-pivot design gives a rather rich tonal balance and some bass muddling. Could be good with Decca cartridges, but not well built	12g		48Summary
Eminent Technology £960	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
Helios Orion 2 £490	Very Good Very Good	Very expensive but with a performance that merits recommendation	12g	R	48
Linn LV Plus £129	Good + Good	The fixed headshell provides an improvement over the LVX resulting in better clarity, detail and punch	13g	BB	48
Linn Ittok LVII £429	Very Good Very Good	Suitable for many turntables this top-quality arm performs best with the LP12, the combination exceeding the sum of both parts	13.5g	R	48/Coll
Linn Ekos £895	Very Good Very Good	Superb, state of the art design which builds significantly on Ittok's strengths	9g	R	This
Manticore (Logic) Datum 2 £140	Very Good Good + +	Rated sonically very good with fine depth focus and transparency, good air and life, albeit slightly 'untidy'	15g	R*	48/Coll
Mission Mechanic £700	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 £65	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 £90	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 £350	Average Good	Excellent but flawed arm which needs some development and refinement before it can be wholeheartedly endorsed. Watch this space. Fits Rega cutout	8g		This
SME 3009 Series IIIS £165	Good Average +	A simplified less flexible (as regards adjustment) Series III with a similarly 'soft' sonic character	5g		48
SME 3009 Series III £229	Good Average +	Comprehensively adjustable and very well made, suited to MM and high compliance MC cartridges	5g		48
SME 3009R £291	Average + Average +	A higher mass version of the Series III designed for low compliance MC cartridges	12g		48
SME Series IV £810	Excellent Very Good	Superb engineering and finish with a finely balanced sound giving impressive stereo focus and low coloration	10.5g	R	60
SME Series V £1206	Excellent Very Good	Excellent in terms of design engineering and sound quality, this arm arguably sets a new reference standard regardless of price	10.5g	R	60
Souther Tri-Quartz £895	Average Good	A unique parallel tracking arm that makes up for what it lacks sonically in its unusual appearance	3-4g		48

## CARTRIDGES

Very much the 'slave' of turntable and tonearm and to some extent undermined by the supply of free 'starter' cartridges on many turntable systems, the cartridge is still worth taking seriously. The quality of both the stylus itself and the cartridge's tracking performance are important in preserving that most important part of the hi-fi system - the record collection - and the cartridge also plays a significant role in determining the overall balance of a system.

Cartridges fall into two groups: high output models, capable of working directly into any amplifier, and more expensive low output models. Stereotypically, low output cartridges use the moving coil principle of operation, have better mechanical integrity and tighter tolerances, and give better performance but at much higher cost. Most under-£150 amplifiers and many valve designs need either an extra head amp or transformer to cope with the low output. **Cartridge/amplifier**

interfacing can be very subtle, but even basic high output moving magnet designs benefit in overall balance from optimised amplifier capacitance loading. Still more important, the mechanical cartridge characteristic of cantilever compliance ('springiness') needs to be considered in the light of the effective mass of the tonearm which will be used (see Turntable & Tonearm entries).

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
A&R C77 £20	Average + Average +	A sensible moving magnet package with good bounce at a competitive price	6-16g Normal, MM	BB	48
A&R C77Mg £30	Average - Average	Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8g Normal, MM	BB	This
A&R E77Mg £47.50	Average Average	Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8g Normal, MM	R	48
A&R P77Mg £60	Average + Average +	Cautiously recommended, the P77Mg was preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9g Normal, MM	R	48
Audionote 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		43
Audioquest MC5 £200	Average Average	Offers high-output benefits but the drooping frequency response and severe VTA error preclude recommendation	10-20g Normal, MC		54
Audio Technica AT95E £17	Average - Average	Clear, dynamic if richly balanced, the magnetic '95E is a definite Best Buy	8-14g Normal, MM	BB	48
Audio Technica AT-420E OCC £30	Average Average	Better suited to pop recordings this MM bears some of the sonic hallmarks of the Linn K5	7-14g (damp) Normal, MM	R	This
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		This
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	This

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127

# Uxbridge Audio

**BADA**  
THE ULTIMATE IN  
SOUND ADVICE

<b>AT LEAST 10% OFF ALL DEM STOCKS</b>	<b>KEF 104-2 SPEAKERS £699.00</b>	 <b>LK2-75 £420.00</b>
<b>CANTON FORUM 150 SPEAKERS USUALLY £355 NOW £100</b>	<b>STARTS 10am WEDNESDAY 28th DECEMBER</b>	<b>DENON DCD 3300 CD PLAYER USUALLY £1200 £799</b>
<b>MISSION 770 FREEDOM SPEAKERS £350</b>	<b>MARANTZ PM94 AMPLIFIER USUALLY £1000 £750</b>	<b>ASK ABOUT INTEREST FREE CREDIT</b>
<b>ROTEL RC-RB 850 PRE AMP POWER AMP £245</b>	<b>EPOS ES14 SPEAKERS £299</b>	<b>MICHELL GIRODEK GOLD £525</b>

**ALL NEW EQUIPMENT GUARANTEED  
TWO YEARS PARTS AND LABOUR**

2 YEAR GUARANTEE • UNBIASED ADVICE • FULL INSTALLATION SERVICE

TWO DEMONSTRATION ROOMS • 7 DAY EQUIPMENT EXCHANGE • MAIL ORDER ANYWHERE

0% INTEREST FREE CREDIT - RING FOR DETAILS • PART EXCHANGE GIVEN

  
**NAIM  
SBL  
SPEAKERS  
£980.00**

**AUDIO  
LAB  
8000  
PRE AMP  
POWER  
AMP £615**

**ACOUSTIC  
ENERGY  
AC2  
SPEAKERS  
USUALLY  
£1139  
£799**

Subject to  
Availability  
+ all items  
ex-  
demonstration

**UXBRIDGE AUDIO**  
278 HIGH ST. UXBRIDGE  
MIDDX. Tel: 0895-30404  
OPEN 10 TILL 6 - 6 DAYS A WEEK

# SALE

ACOUSTIC ENERGY • A&R CAMBRIDGE • AR • ARISTON • AUDIOLAB • B&W • BLQ  
CAMBRIDGE AUDIO • CANTON • CREEK • CYRUS • DENON • DUAL • EPOS • EXPOSURE  
GALE • HEYBROOK • INFINITY • JPW • KEF • LINN PRODUCTS • LOGIC • MANTRA  
MARANTZ • MERIDIAN • MICHELL • MISSION • MONITOR AUDIO • MORDAUNT SHORT  
NAD • NAIM • NAKAMICHI • ONIX • QED • QUAD • REVOLVER • ROGERS • ROTEL • RUARK  
SPENDOR • STAX • TANNOY • WHARFDALE • YAMAHA



# THE DIRECTORY

## CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Audio Technica AT-F50CC £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	This
Audio Technica ATOC7 £250	Good + Good +	Technically and subjectively this cartridge represents a new dawn for AT, in the twilight of analogue audio	6-13g Low, MC	R	54
Audio Technica ATOC9 £400	Average + Very Good	Tonal colours were reproduced faithfully while stereo images were clearly isolated and focused despite contributing to a thoroughly integrated whole. Slightly less transparent than more costly MCs	6-14g Low, MC	R	60
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 £799	Good Very Good	Looking like a piece of NASA gadgetry the Chorale's transparent treble delicacy was without equal. A serious audiophile choice	4-10g Low o/p, MC	R	48/Coll
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 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 Low, 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		This
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	This
Glanz MFG 110EX £24	Average Average	A little bright but giving detailed bass and clear treble this was competitive at the price	6-16g Normal, MM	R	Systems
Glanz GMC-10EH £49	Good Good	The rising HF trend of this high o/p MC may cause problems in certain systems but with a favourable wind its seductive qualities will win out	8-14g Normal, MC	R	This
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		This
Glanz GMC20E £129	Average Average	You could try haggling but we thought the makers of this number were demanding too much lucre for their product	3-6g Low, MC		48
Goldmund Clearaudio £1500	Average +	Something of a mixed bag overall, its sonic character bears a strong resemblance to the Pradikat though it shares some of the hallmarks of the more expensive Accurate	5-12g Low, MC		60
Goldring Elan £15	Average + Average	A lightweight and frisky-sounding MM that appears to be based upon the same body as the Nagaoka mm4	7-15g Normal, MM	R	This
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	This
Goldring G1010 £36	Average Average	A bit fiddly to set-up but rewarding once accomplished. The big and bouncy sound belies its price. Sensitive to amp loading	10-20g Normal, MM	BB	54
Goldring G1020 £53	Average + Average -	This one strutted finely onto stage but couldn't project to the "gods"	8-16g Normal, MM		43
Goldring G1040 £79	Average + Average -	High frequency extension was improved by the van den Hul tip, nice looking model - no great actress	8-16g Normal, MM		48
Goldring Eroica L £95	Average Average +	Open and relaxed sounding, the L version is just that bit more refined than its high output brother	7-18g Low, MC	R	54
Goldring Electro II £149 complete	Average Average +	A pretty decent allrounder that did not excel sufficiently to warrant recommendation	8-16g Normal, MC		43
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 £20	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

# 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
Grado XF3E + £43	Average - Average	Downtilting balance disguises the brightness of this cartridge; bit of a mixed bag at this price	9-20g (damping) Normal, MM		54
Highphonic MCA3 £360	Very Good Good +	Exquisitely crafted by a group of ex-Denon engineers, this superb tracker had a sweet and seductive (if rather bright) treble	5-12g Low, MC		43
Kiseki Blue Silver Spot £395	Average + Good	Solid performance from a very solid cartridge but lacks some of the magic of other Kisekis. Compliance too high	5-12g Low, MC		54
Kiseki Purpleheart Sapphire £695	Good + Good +	Rare, beautiful to look at and sweet to listen to, our review of this high-flyer conjured up images of Japanese art	5-14g Low, MC		Collection
Kiseki Blackheart £1595	Good Good	This cartridge demonstrated refined poise and a delicate but at once potent security, however, the price did seem a little on the high side compared to other Kisekis	6-16g Low, MC		60
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 K £577	Good + Good +	Impressive in scale and dynamics but with some criticism of bass muddling and high treble fizz. Listen before deciding	6-18g Low, MC	R	48/Coll
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 £1298	Good Excellent	Technically this cartridge suffers no faults whilst on a subjective level it offers rare musical insight	10-21g Low, MC	R	60
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	This
Linn K9 £69	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 £279	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 £625	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		This
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	This
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 uninviting	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		This
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

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127

# THE DIRECTORY

## CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Ortofon MC30 Super £250	Very Good Good+	Beautifully engineered and well-balanced, it was slightly criticised as bland, though some may appreciate the lack of rough edges	5-14g Low, MC		Coll
Ortofon MC3000 £800	Good Excellent	Quite simply, the most accurate transcription device yet created – not one for the faint hearted	6-16g V. Low, MC	R	60
RATA RP20 £22	Average— Average	Good integration, a clear dynamic midrange and the beginnings of fine stereo imagery merits clear recommendation	6-14g Normal, MM	R	48
RATA RP40 £44	Average Average+	The '40 did a good job of sorting out the layers and complexity of the mix, with good focus, excellent stereo spread and fine scale	6-15g Normal, MM	R	48
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	This
Rega Bias £34	Average Average+	Difficult to mount in some arms due to its shallow build, the bias offers a gentile, refined SQ that certainly makes it worthy of audition	4-10g Normal, MM		This
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	This
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	This
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 ME75E0 £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	This
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 £799	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

## 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 AR-04 £160	Very Good Good	A powerful, well equipped model precisely tailored to UK standards. Performance is close to the class winners	40W, MM/MC, 5 inputs, hdph, tone controls	BB	62
A&R Arcam Alpha £150	Average+ Fair	This good all-rounder sounds musical if slightly softened. Good build and presentation	5 inputs hdph MM/MC tone controls 30W	*	50
A&R Arcam Delta 60 £250	Very Good Fair	Our first pre-production review sample was not up to expectations but better ones have arrived since. It gave a solid technical performance	55W, MM/MC, 5 inputs, hdph		62

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127



# All good ideas radiate

With 5 totally segregated demonstration studios and with a range of quality chosen electronics to suit most budgets Hampshire Audio is best equipped to demonstrate the character and value of loudspeakers . . . . .

## Hampshire Audio Ltd

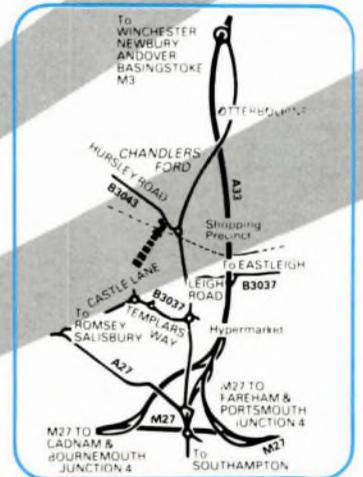
Kingfisher House  
2-12 Hursley Road  
Chandlers Ford, Hants SO5 2FU  
Tel: 0703 265232/252827



SUCH AS  
THE MISSION 761



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, Revax, Rogers, Rotel, Sennheiser, Snell, Stanton, Supex, Wharfedale, and others. Active systems on demonstration.



OPENING HOURS  
10AM-6PM  
(8PM THURSDAY)  
CLOSED MONDAY  
Except in DECEMBER



# THE DIRECTORY

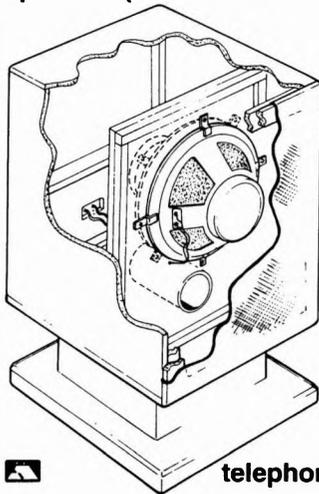
## AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>A&amp;R Arcam Delta 90</b> £330	Good Fair	Well balanced and sweet-natured in any given system with MC capability, but pricey	70W MM/MC 5 inputs tone controls		50
<b>Albary M408 II</b> £649 pr.	Good + Good +	Unusually styled transistor monoblok power amplifiers reintroduced with improved performance and sound quality. Needs good warm-up for best sweetness and clarity	40W Power amp only	R	56
<b>Albary M1008 II</b> £899	Very Good Good	A larger version of the similarly styled M408II, fairly good all round but only of average quality for the price	80W, monoblok		62
<b>Aria Acoustics Aria 12</b> £299	Poor Very Good	A plain looking valve power amp that's something of a wolf in sheep's clothing giving many dearer amps a run for their money	12W	BB	63
<b>Audio Innovations Series 300</b> £339	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
<b>Audio Innovations Series 1000/2nd Audio Amplifier</b> £1199/1999	Poor Excellent	This valve combination offered awesome dynamic range with superb transparency and power to match. Compatibility with other brands is unpredictable	15W, MM, 6 inputs, monobloks	R	63
<b>Audio Research SP9</b> £1700	Very Good Very Good	This new high performance valve FET hybrid preamplifier sets a high standard for versatility, build quality and sound	5 inputs, MM/MC	R	60
<b>Audio Research SP8</b> £1998	Very Good Good +	The sound from this valve preamp was good enough to do justice to the finest ancillaries	5 inputs MM		39
<b>Audio Research M100</b> £2850 each	Good + Excellent	These high end valve monoblok power amps justify their cost by providing near state of the art sound quality. Our reviewer was so excited he bought them	100W	R	60
<b>Audio Research SP11 II</b> £5350	Very Good Excellent	Current state of the valve preamp art. A reference point	Straight line MM/MC Disc + phase invert	R	60
<b>Audiolab 8000C</b> £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
<b>Audiolab 8000A</b> £350	Very Good Good	A long running and high dependable classic, versatile and consistent via all inputs	50W, MM/MC, 5 inputs, hdph, tone controls	R	62
<b>Audiolab 8000P</b> £495	Excellent Very Good	A dynamic powerhouse, load tolerant and sonically reliable	100W	R	62
<b>Beard Audio CA35/P35mkII</b> £595/£795	Fair + Very Good	Good build quality and a very smart finish combine with a characteristic valve sound to make a first class amplifier capable of giving hours of musical enjoyment	35W, MM/MC, 4 inputs	R	63
<b>Beard 506</b> £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
<b>Beard M70</b> £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
<b>Burmester 838</b> £1490	Very Good Good	A disc-only minimalist preamp, strong points include excellent build, extreme neutrality, dry clean bass and notably sharp stereo focusing	MC only, MM option		Collection
<b>Burmester 846</b> £1599	Very Good Good +	Usually coupled with the 838 this high-level preamp provides many and versatile input facilities	6 inputs		Collection
<b>Burmester 850</b> £3995	Good + Good	Each of these mono power amplifiers contains separate high current 25W amps giving a refined coherent sound over most of the frequency range	100W		Collection
<b>Cambridge Audio P40</b> £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
<b>Cambridge Audio C75</b> £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
<b>Cambridge Audio P55</b> £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
<b>Cambridge Audio A75</b> £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
<b>Cello Audio Suite</b> £5280	Excellent V Good/Excellent	Cello's preamp represents a whole new ball game in flexibility and sound quality (or war of attrition on your wallet)	Optional inputs MC etc	R	50
<b>Conrad Johnson PV7</b> £785	Very Good Good	This beautifully finished quality preamplifier performed well, delivering a musically relaxed sound though not offering especial value for money	5 inputs, MM disc		57
<b>Conrad Johnson MV50</b> £1699	Good + Good +	Coupled with the PV5, this CJ power amp performed well on audition	50W		Collection
<b>Conrad Johnson Motif MC-8</b> £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
<b>Copland Pre and power amps</b> £649 each	Good + Fair	At £649 each this simple Danish valve pre/power combination is expensive, though the power amplifier sounds very easy on the ear	3 inputs MM, 12W		50
<b>Counterpoint SA7</b> £747	Average + Good	Simple valve Californian preamp offering inspiring transparency for the price	4 inputs straight line MM/MC		Collection
<b>Counterpoint SA12</b> £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
<b>Creek 4040</b> £145	Average + Fair	This simple integrated model had a controversial sound, liked by some, plus an acceptable lab performance	4 inputs MM 12W	R	50
<b>Creek CAS 4040 II</b> £160	Good Good	The Mk II has no problems and is a fine all rounder	30W, MM, 4 inputs, tone controls	BB	62
<b>Creek CAS 4140</b> £219	Good + Good	Redesigned for '88, this is a fine allrounder with good moving coil input, plain presentation	40W MM/MC 3 line inputs	BB	62
<b>Croft Micro</b> £150	Average + Good	A real upsetter, this excellent valve preamp put the cat among the pigeons proving good sounds can be made at budget price levels	4 inputs MM straight line	R	Collection
<b>Croft Super Micro A</b> £500	Average + Very Good	The looks are somewhat improved, while this 'hot rod' version with tuned components performed very well indeed. There is still no gain on the line inputs	4 inputs, MM, straight line	R	57
<b>Croft Series IV(S)</b> £730	Good Good	The original IV is still available now supplemented by the higher price and power (S); both are fine performers	40(60)W channel	R	57
<b>Croft Series IVSA</b> £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
<b>DBX CX3/DX3</b> £1500	Good Fairly Good	Versatile separates majoring on 4-channel surround sound and high power. Garish presentation and unexceptional sound	125W MM/MC 7 inputs, tone, 4-channel surround		56
<b>Deltec DPA 100S</b> £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
<b>Denon PMA 250 II</b> £125	Good Fair	Despite a claimed increase in power this competent model now slips behind the competition on sound quality grounds	30W, MM, hdph, tone controls		62

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

## £150 + £125 = £1000?

Add our £125 sub-bass unit to your £150-per-pair "Best Buys" and your system will sound as if it has LARGE (and expensive!) speakers. Although very compact, this ingenious Push-Pull design will fill-in that missing "Bottom Octave" and can be sited almost anywhere in the room—without affecting the stereo image. It can be connected directly into systems with medium sized speakers (87-90 dB sensitivity).



The Wilmslow Audio CPP sub-bass speaker kit contains 2 10" drive units, flatpack cabinet kit (inc. stand) machined from smooth MDF for easy assembly, low pass filters, grille fabric, reflex port etc. Dims. (inc stand): 571x366x336mm Amp. suitability: 20-120 watts Impedance: 8 ohms PRICE £125 inc. VAT plus carr/ins £11

telephone credit card orders

### WILMSLOW AUDIO LTD.

35/39 Church Street, Wilmslow, Cheshire SK9 1AS Tel: 0625 529599

Call and see us for a great deal on HiFi (Closed all day Mondays)

DIY Speaker catalogue £1.50 post free (export \$6)

# WHAT'S NEW AT ACOUSTIC ARTS

1989 at Acoustic Arts promises to be a vintage year if early indications are anything to go by. Not only do we plan exciting new extensions to our demonstration facilities (more about that next month) but the start of the new year sees three important and significant companies joining our already impressive list of manufacturers.

## STAX



We are delighted to be appointed a main dealer for Stax headphones. The range includes the fabulous Lambda Signature and PRO models plus the new Gamma PRO headset which has received excellent reviews from the press. Pay us a visit and enjoy a new experience in headphone listening — they really are the finest available anywhere. Before we leave Stax we must mention the stunning new Quattro II CD player which received a rave review from Martin Colloms in Hi-Fi News recently, we currently have the Quattro on dem.

## ARAGON



From the USA comes the magnificent Aragon Pre-amp and two Power amps. Stunning performance and unusual aesthetics characterise these marvellous new models. If you are in the market for true high-end performance at a medium price Aragon is just what you are looking for. Amazing value for money.

## MICROMEGA



The most interesting and in a way unexpected CD news comes from France. We are proud to announce that we now have on dem the fantastic Micromega CD player. If you have had any doubts about the CD medium this model will surely dispel them. Pretty to look at and quite beautifully made both the transport and electronics are manufactured in France. We strongly recommend an early audition. The Micromega really does set a new standard for CD players.

Apart from these three new additions to our range there are many exciting products to see and hear. Pay us a visit and find out why customers travel from miles around to see us.

### Our Agency includes:

A & R, ATC, Acoustic Energy, Air Tangent, Alexander, Alphason, Apogee, Aragon, Audiolab, Beard, Bryston, Castle, Celes on, Counterpoint, Crystal, Deltac, Denon, Dual, Ensemble, Gale, Goldmund, Heybrook, Incatech, Jadis, Koetsu, Krell, Linx, Magneplanar, Mantecore, Marantz, Meridian, Micromega, Monitor Audio, Musical Fidelity, Orell, Pink Triangle, P.S. Audio, Quad, Quicksilver, Revolver, Revox, Robertson, Rogers, Roksan, Rotel, SD Acoustics, SME, Sonus Fabus, Spondor, Stax, Sumo, Systemdek, Source, TDL, Tannoy, Thorens, VDH, WTA, Wharfedale, Yamaha.



101, St. Albans Road, Watford, Herts Telephone: Watford 245250  
Open Monday-Saturdays 9.30am-5.30pm

Musical Approach

STAFFORD 55154

FOR ALL YOUR  
HI FI NEEDS  
& REPAIRS

OF  
STAFFORD

Stockists of:-

Linn Products, NVA, Exposure,  
Onix, Audio Technica, Mantra,  
Royd, Rotel, Marantz, NAD,  
Monitor Audio, Tannoy,  
Ariston, Alphason.

Credit facilities now available  
(subject to status)

**MUSICAL APPROACH**

137A NEWPORT ROAD,  
STAFFORD

TEL: 0785 55154

NEXT DOOR TO RITZY - ABOVE ROYAL LONDON INSURANCE

# THE DIRECTORY

## AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Denon PDA-6600 £1,000/pair	Excellent Excellent	Delivers abundant high quality sound, solid engineering expertise and content clearly compensating for any compromising of purist audiophile principles	250W monoblok, remote power	R	60
DNM 3 £1000	Good+ Very Good	The DNM3 in its acrylic case is a remarkably revealing and neutral state of the art preamp	5 inputs MM/MC twin vol controls	R	44
E.A.R. 802/509mkII £920/£1550	Average Very Good	Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100W, MM, 6 inputs, monobloks	R	63
E.A.R. £3,000/pair	Very Good Very Good	A valve monoblok that measures like a solid state amp is itself an achievement, but exceptional power delivery and bass 'slam' is not fully matched by delicacy and transparency elsewhere	200W monoblok, bias setting		60
Exposure VII/VIII £360/£340	Very Good Good	Supplied as a combination without the separate preamp power supply, this pre power combination performed satisfactorily especially on the moving coil input	50W, MM/MC, 3 inputs, straight line		62
Goldmund Mimesis 6 £2,500	Very Good Very Good	Small and discrete for those who'd rather not flaunt it, this is no powerhouse but sounds subtle, delicate and refined	80W stereo power amp		60
Grant G60AMS £948 pr.	Good Very Good	This neat and compact 60W valve monoblok gave good sound on the 8ohm tap, better still on 4ohms. The midrange was particularly natural	60W monobloks 41 8ohms	R	57
Hafner DH120 kit form £295	Fair	We didn't build one, see below	60W		44
Hafner 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 640 Vxi £225	Good+ + Good	Moderately priced but built to HK's high standards; good value and good load tolerance	50W MM, 5 line inputs tone controls		56
Harman Kardon PM645VXi £300	Very Good Good	Fits in well with the Harman Kardon series, giving a competent all round performance at a fair price	75W, MM/MC, 5 inputs, hdph, tone controls		62
Harman Kardon 655 Vxi £449	Very Good Good	Plenty of well built integrated amplifier for the money, with lots of power to drive almost anything plus versatile inputs	100W MM/MC 6 line inputs tone controls		56
Harman Kardon PM665Vxi £699	Good Good	A versatile and meaty amplifier with high current capability, but sound quality lags behind certain home grown alternatives	150W MM/MC tone controls (switchable)		60
Hitachi HA-006 £120	Very Good Fair	Despite reasonable lab test results this did not make the grade on sound quality	55W, MM, 4 inputs, hdph, tone controls		62
Hitachi HA007 £150	Good+ Fair	Decent but unexceptional performance and sound quality, plus good facilities; represents a worthwhile improvement from Hitachi	75W MM 6 line inputs tone controls		56
Inca Tech Dirk £215	Good+ Good+	This tiny, minimalist model is effectively a power amplifier with volume control, providing inputs for CD player and tape recorder but not tuner!	50W, 2 line inputs, straight line		56
Inca Tech Claymore £345	Good+ Good+	Limited facilities but a strong, clear, well-focused sound results in auspicious Choice debut for this relatively young company	50W MM/MC 3 line inputs straight line	R	56
ITL MA-80 £150	Good Good	A promising start for this young company, the MA-80 gave a fine sound with CD but was less wonderful on the moving coil input	30W, MM/MC, 5 inputs	R	62
Jadis JP30/JA30 £6,790	Fair Excellent	Two-box preamp plus monoblok power amps, classic valve design gives stereotype valve sound. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at frequency extremes, in lab, and re cartridge matching	30W 2-box pre-, monoblok power, MM-only, 4 line inputs	R	60
JVC AX-222 £110	Good Fair	Not very impressive, JVC need to pull their socks up if their budget amplifiers are to score	35W, MM, 4 inputs, hdph, tone controls		62
Kelvin Labs Junior/130 £295/£295	Good Good	Their heart is in the right place but the class A Junior combination is a bit expensive for what you get	20W, MM/MC, 5 inputs		62
Kenwood KA-550D £130	Very Good Fair	Having dropped its moving coil input, this latest version has British style dynamics and rhythm but is not first grade yet	35W, MM, 4 inputs, hdph, tone controls	R	62
Krell PAM5 £1589	Very Good Good	Superbly built, the Pam 5 preamp gave good definition throughout the frequency range with a good measure of excitement	MM/MC		50
Krell KSA50 Mk2 £2540	Very Good Good+	This power amp still holds its own with good depth and ambience and excellent stereo focus	50W		50
Le Tube £585	Good+ Good	If moving coil sensitivity is not required then this preamplifier will offer a clean view with very good stereo	3 inputs MM	R	44
LFD £,995+	Very Good Excellent	Can set the subjective standards that others merely aspire to, but this outstanding if unconventional multi-box preamp needs careful matching to ancillary components (cartridge, power amp)	MC (with care), passive line extra	R	60
Linn LK2 £440	Good+ Fair	A durable tolerant power amp, setting a respectable standard on both lab test and audition. Latest version, the LK2.75, not yet tested	5 inputs MM/MC	*	50
Linn LK1 £459	Good+ Fair	This preamp was marginally less successful than the LK2 but the pair (of Linn's) worked well together and are well worth considering. Recent modifications as yet unchecked	60W	*	50
Luxman LV100 £205	Good Fair	Nicely finished modern integrated amplifier, generally competent though not exceptional	45W MM 4 line inputs tone controls		56
Luxman LV-105 £599	Very Good Fair	Superbly finished and built, in a sense this model managed to capture the "valve" sound with an easy musical quality and good bass register	85W MM/MC		44
Luxman LV105u £685	Very Good Good	This very well equipped and beautifully finished Japanese integrated amplifier has two valves in the early section of the power amplifier. Pleasant and musical it sets no value for money record here	9 inputs 80W, MM/MC tone controls		57
Magnum A100 £1995 pair	Good+ + Good+	Given their massive power rating a pair of A100's make a fine stereo power amp, ideal for high levels and with a wide dynamic range for digital programme	320W		50
Marantz PM25 £125	Good Fair	Soft and sweet like the rest of the range, the PM25 is inoffensive and undemanding	25W, MM, 5 inputs, hdph, tone controls		62
Marantz PM35 £170	Very Good Good	This new generation Marantz is a good allrounder, and shows that extra care is being taken over sound quality; well equipped and versatile	45W MM/MC 3 line inputs tone controls		56
Marantz PM45 £200	Good+ Fair	Generally pleasant and polite with above average clarity, there was some softening in the bass, restricting dynamic output somewhat	40W MM/MC tone controls		50
Marantz PM94 £1,000	Very Good Good	At 23kg the PM94 is no lightweight in either physical or sonic respects. A very powerful and comprehensively equipped amplifier	140W MM/MC tone controls (switchable)		60
Meridian 201/205 £550/£395 each	Very Good Good+	A fine preamp with additional luxury option of full system remote, plus competent and attractive monoblok power amplifiers with generally good performance	100W MM/MC 6 line inputs remote capable straight line	R/—	62
Mission Cyrus One £180	Very Good Good	A red hot class winner, which caused the whole issue to be re-rated! It's even well built - however, the headphone socket will only take a 3.5mm jack	30W, MM/MC, 5 inputs, hdph, straight line	BB	62

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127

## THE DIRECTORY

## AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Mission Cyrus PSX £200	Very Good Very Good	The PSX does make the Cyrus Two sound better, and also improves the PCM II CD player giving more wallop and clarity	Auxiliary power supply	R	62
Mission Cyrus Two £300	Very Good Very Good	Also a top performer in its group with fine moving coil and compact disc sound. Again, only 3.5mm headphone socket	50W, MM/MC, 5 inputs, hdph, straight line	R	62
Mordaunt Short MS-A5000 £350	Very Good Good	With a recognisable pedigree, Mordaunt Short engineers have made a good job of this one. A musical all rounder	50W, MM/MC, 6 inputs, hdph, tone controls	R	62
Musical Fidelity A1 £249	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 Pre 3/P140 £299/£299	Very Good Very Good	Delivering true audiophile sound quality well ahead of their price, both components shine in their own right	70W MM/MC 4 line inputs straight line	R	56
Musical Fidelity A100 £439	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 £499	Very Good Very Good	Acquitted itself well, later samples showing steadily increasing refinements	85W	R	50
Musical Fidelity MA-50 £875 pair	Good Excellent	An audiophile bargain. One of the best sounding power amplifiers made	50W, monoblok	R	62
Musical Fidelity MVT Mk 3 £1199	Very Good Very Good	The MVT preamp was "strong in its class", providing competition for £1500-plus amplifier systems, now rivalled by the MF3B	MM/MC 5 inputs	R	50
Musical Fidelity P270 £1199	Very Good Excellent	If the hot-box aspect is not a deterrent, this is something of a bargain. A big amplifier scale of sound which is just a little rough-edged	135W	R	50
Musical Fidelity MVX £2,000	Very Good Excellent	Soundwise this preamp puts Musical Fidelity on terms with much more expensive exotics, with top class transparency, focus and dynamics	MM/MC, phase invert	R	60
Musical Fidelity A370 £2199	Very Good Excellent	Arguably the finest sounding power-amplifier manufactured in the UK	185W	R	50
NAD 3020e £110	Good Fair	A little light in balance and "weight" but superior to run-of-the-mill budget amplifiers	20W MM/MC 4 inputs	R	50
NAD 3220PE £140	Good Fair	Like the 3020E but with more peak power and loudness thanks to the 'power envelope'	20W, MM, 5 inputs, hdph		62
NAD 2200 £339	Good+ Fair	Not recommended on grounds of sound quality, but worth serious consideration for its exceptional power output	100W		44
Naim NAIT 2 £322	Average+ Fair	Well built with good load tolerance the NAIT delivered a fully competitive sound in spite of its modest measured power output. Recent modifications as 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
Nakamichi CA-5E £750	Very Good Good	A fine lab performance and high build quality but rather disappointing sound quality for a preamp of this price	MM/MC, 6 inputs, hdph, tone controls		62
Nakamichi PA-5E £1150	Very Good Good	A strong sound in several respects but one which ultimately failed to satisfy	100W		62
Nakamichi CA7E/PA7E £2500/£1700	Very good Good/Good+	Exceptional build and finish, plus good general performance, remote control and versatility, but expensive	200W MM/MC 6 line inputs, remote, tone controls		56
Nuance £795	Very Good Good	A subtle civilised pre-amp though a little lacking in resolution and detail; suited to some tastes but not top-drawer	4 inputs MC		50
Oakley Image £425	Poor Very Good	An interesting valve preamp from Yugoslavia, the Image on first impression needs a bit of tweaking to warrant <i>Choice</i> commendation but is a nice product nonetheless	MM, 5 inputs straight line		63
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
Pink Triangle PIP £2670	Excellent Excellent	This state-of-the-art preamp is one of the few truly high end products to come out of this country this year. It will most certainly worry the competition	MM/MC, 4 inputs, battery supply	R	62
Pioneer A333 £149	Very Good Fair	A rather average but nonetheless competent performer that is pleasant enough	55W, MM, 5 inputs, hdph, tone controls		62
Philips FA860 £249	Very Good Fair	Well balanced model from Philips' Japanese factory, with versatility, good build and finish	70W MM/MC 5 line inputs tone controls		56
Philips FA960 £299	Very Good Good	Japanese built high quality integrated model with versatile features and plenty of power	110W MM/MC 8 line inputs tone controls		56
Plenitude £795	Very Good Good+	Rating slightly higher than its Nuance partner, this power amp provided a tight, controlled sound, if somewhat lacking in scale and grace	80W	R	50
QED A240 CD II £169	Good+ Good	Latest 240CD is fine value for CD and has competent MM disc input as well	45W MM 5 line inputs straight line	BB	62
QED A240 SA II £219	Good+ Good+	Redesigned 240SA represents a significant allround improvement over its predecessor, and provides a good moving-coil disc input in a competitive price	45W MM/MC 5 line inputs straight line	BB	62
Quad 34 £289	Very Good Fair	This well-built durable preamp has useful filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4 inputs MM/MC tone controls		44
Quad 405 £349	Very Good Fair	Not an impressive power amp but easy on the ear if not pushed and very reliable	100W		44
Quicksilver Mono £1495	Good Good+	Moderately improved for '88 the Quicksilver still rates well despite up and coming competition	60W monoblok 4/8ohms		57
Radford SC25 £862	Very Good Very Good	A very fair price for a solid, well built valve preamp, combining good allround performance and a neutral sound	5 inputs, MM, straight line	R	57

To Advertise in  
this space ring Cindy Forde  
on 01-631 1433

# THE DIRECTORY

## AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Radford MA75 £977	Good Very Good	A fine quality valve monoblok with good load tolerance and a neutral accurate sound, offering significant gains in power and focus over the STA25	75W monobloks	R	57
Radford STA25 Renaissance £1115	Good Good+	Offering superb midrange performance if not quite as good at the extremes, the Renaissance valve power amp is a genuine audiophile product	25W	R	50
Revox B250 £1128	Very Good Good	With much improved sound over its predecessors plus amazing remote control facilities, this could form the heart of a round-the-dream-house system	150W MM/MC system/house remote tone controls		56
Robertson Forty Ten £987	Very Good Good	Here is a neat little power amp (60W) you can fit and forget; it proved most satisfying over long listening sessions	60W		Collection
Rose RV-23 £370	Average Very Good	A very attractive little British valve preamp with a sound that was rich, colourful and reasonably sharp via the CD input but was less impressive on disc	MM, 4 inputs, straight line		63
Rotel RA810A £100	Very Good Fair	As a cut price RA820AII this is a very successful little amp that loses little in sound quality to its predecessor. Excellent value	20W, MM, 5 inputs, hdph, tone controls	BB	62
Rotel RA820A £130	Good++ Good	This A version of an established budget favourite delivers the goods sonically and is fine value for money	35W MM 4 line inputs tone controls	BB	56
Rotel RB/RC850 £140/£119	Good++ Good+	Quality separate pre and power amplifiers at near budget integrated amplifier prices. A notable achievement	60W MM/MC 4 line inputs tone controls	BB	62
Rotel RA820BX3 £160	Very Good Good	The latest upgrade is not that impressive, but the BX remains a fine amplifier and now has a moving coil disc input	30W, MM/MC, 5 inputs, hdph, straight line	BB	62
Rotel RA870BX £325	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
Sansui AU-G11X £139	Good+ Fair	Tightly controlled if somewhat congested and lightweight, but a reasonable compromise between features and sound quality	25W MM hdph 4 inputs, tone controls		50
Sansui AU-G30X £199	Good++ Fair	A very competent amp with no glaring faults, performing well with phono and compact disc inputs	4 inputs MM 45W tone controls hdph		50
Sansui B2301 £1880	Very Good Good+	Rating better than the preamp and providing generous power output, this amp could not be considered competitive in its price bracket	300W		Collection
Sansui C2301 £2306	Excellent Good	Sansui's flagship preamp did not really rate well given its price, but is not short on features	All facilities		Collection
Sony TAF 500ES £349	Good+ Fair	Not too hot at the price, lacking in bass action, rating poorly on vinyl, and only marginally improving on CD	75W hdph tone controls MM/MC		50
Sony TAF 700ES £500	Good++ Fair	Scoring higher than the 500 but still not offering the sort of standards set by the competition. But many buttons to push	100W MM/MC tone controls		50
Sumo Nine+ £1200	Very Good Excellent	Macho styling of this class A stereo power amp conceals a sonic subtlety that is exceptional for the price, limited by lots of waste heat and a noisy fan on our sample (being improved)	65W	R	60
Tannoy SR-840 £1713	Very Good Good	A "muscle" power amp, capable of impressive levels into difficult loads while remaining quite subtle and revealing	250W		50
Vacuum State FVP £999	Good Very Good	This well thought out valve preamplifier is designed for optimum musicality and transparency, a goal which is handsomely achieved	5 inputs, MM, straight line	R	57
Yamaha AX-300 £120	Good Fair	A lively and dynamic performer, offering a credible if bright sound at a competitive price	30W hdph tone controls (MM)		50
Yamaha AX500 £200	Very Good Good	A well built versatile performer with generous power, decent sound	90W MM/MC 5 line inputs tone, var. loudness		56
YBA 2 pre & pwr £1395/£1695	Good++ V Good/Excellent	Superbly finished French audiophile separates, with very good space and transparency, slightly softened bass. Needs extra transformer (£300) for MC cartridges	70W MM (MC extra) straight line	R	56
YBA 1 preamp £2895	Very Good Excellent	A front line French audiophile product. Great stereo and a fine Krell style finish	MM/MC, 3 inputs, straight line	R	62
YBA 1 power amp £2995	Good Excellent	This equally well finished power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85W	R	62

## LOUDSPEAKERS

Last item in the hi-fi chain, to some extent the loudspeaker is merely the slave of what has gone before, capable only of reproducing a signal as good as it is fed. Nevertheless the distortions (colorations and stereo effects) introduced by loudspeakers (and rooms) tend to be more immediately obvious than those anywhere else in the chain, so careful choosing according to taste is very important.

The average loudspeaker consists of a smallish enclosure, much of which may have begun life as

part of a tree, plus a couple of drive units hidden behind a removable grille. Inside the box lurks a simple electrical circuit known as a crossover, which divides the incoming (full range) signal into the right bits for the drivers to handle. Variations on the above formula are specifically identified in the entries. The designer's primary task is to balance the **sensitivity** of the loudspeaker (how loud it goes for a given electrical input) against the **bass extension** (how low does it go) for the given box **size**. After that such subtleties as coloration and

dispersion come into the equation.

Careful **placement** of the loudspeakers within the room is as important as the initial choice of model. For good stereo they need to be more or less the same distance from nearby walls, and preferably on similar rigid stands. The listener should be about the same distance from and listening angle to each loudspeaker. The ideal **placement** depends on the way a particular model has been balanced (not to mention a number of other factors), and our recommendation is given in the entries.

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Acoustic Energy AE1 £700	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
Alexander Aurora £350	Average Good-	The unusual metal case and slim shape of this grown up miniature provide welcome diversity. It sounds pretty good too	42.5 x 14 x 19cm matching stands in free space	85dB/W 55Hz		66
Apogee Caliper £2550	n/a Very Good	Near state of the art performance, not materially worse than bigger Apogees, just less bass. Rich, subtle and slightly dull, with a clear, articulate midband, but uncommonly system fussy.	122.5 x 71 x 10cm ex. rear foot, free standing, away from walls	n/a n/a	R	60
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/Coil
A&R 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
A&R Arcam Two £260	Good Average	Most things to most men this compact is unlikely to disappoint with its lively "bally" character though lacking weight... a bit	38 x 23 x 28cm near wall shelf or 40cm stands	88dB/W 55Hz		59
A&R Arcam One Plus £359	Good Average	Provides a solid, weighty and rich sound, but is a little raw in the treble and indefinite in the midband	22.3 x 28.1 x 37.8cm open space, on stands	88.5dB/W 60Hz		59

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127

## THE DIRECTORY

## LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
AR 112 £120	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
AR 132 £180	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
Ariston Image £185	Good Average	Good engineering content at a reasonable price, the Image delivers fine stereo with low coloration, but sounded too bassy under our listening conditions.	42 x 22 x 27cm stands in free space	87dB/W 55Hz		66
Ariston QLN1 Mk 2 £350	Very Good Good+	This very sophisticated loudspeaker has much of the euphony of a LS3/5A but with rather more 'oomph'. A little 'romantic' for some tastes – Schubert and Sting rather than Stockhausen or the Stones perhaps?	35 x 25 x 26.5cm free space, 24 inch stands	84.5dB/W 65Hz	R	59
Audiostatic ES200 £1495	Average Average+	Sounding forward and unbalanced with limited bass power, these excelled in transparency and detail, and might suit some tastes.	150 x 53 x 23cm low stands, free space	79dB/W 45Hz		46
Audiostatic ES300 £1995	Average+ Good	Marred by similar problems to its cheaper ES200 stablemate, this line source electrostatic was superb in the upper-mid and treble but lumpy in the bass.	44 x 5 x 93cm free standing	82.5dB/W 30Hz		46
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 55Hz		53
Avance Concrete 2000 £970	Below Average Below Average	Very low cabinet talk, but the system sounds terminally uneven – lumpy bass and over-forward midband dominate.	86.5 x 29.2 x 43cm clear of walls	94dB/W 40Hz		60
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 DM1600 £399	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 6.2 £570	Average— Average—	Wishy-washy (but not unpleasant) sound and vague imagery are the hallmarks of this unusual design.	25.4 x 50.8 x 24.4cm free space, on stands	87.5dB/W 55Hz		59
Boston A4011 £110	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 60 Karat £600	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
Celestion DL6 Series Two £149	Good Average	Good tonal colouring and plenty of bass for the enclosure size, the metal dome tweeter is excellent, but bass and mid lack clarity and 'bite'.	45.4 x 24.5 x 26.2cm near wall, on stands	87dB/W 65Hz		59
Celestion DL8 Series Two £199	Very Good Good	A refined middle market speaker has a smooth but slightly dull quality, with good definition and 'leap', if slightly boxy bass.	50 x 27.5 x 27.8cm open, stands	87.5dB/W 60Hz	R	59
Celestion SL125i £580	Average Average	Careful setting up does reveal elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling.	53 x 20 x 27cm matching stands clear of walls	85dB/W 50Hz		66
Celestion 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
dbx 1000 £450	Average— Average—	This system sounds soft and woolly, with an effusive bass, an occasionally sharp treble, and a recessed midband. Stereo positioning is poor.	78.7 x 35.6 x 27.9cm against rear wall	91dB/W 60Hz		59
Energy 22 Pro Monitor £600	Good Good	Presentation is a bit rough for the price, but this Canadian entrant is an impressive sonic allrounder that will appeal to most listeners.	62.5 x 27 x 30cm stands in free space	87dB/W 40Hz	R	66
Gale 301 £280	Average Average+	Of unusual, distinctive appearance this produced a mixed response, being lively but lacking depth.	44 x 23.5 x 22cm on stands quite near wall	86.5dB/W 63Hz		46
Gale GS402 £700	Average+ Average+	Clean but rich and powerful bass, stereo focus was not a strong point, but it is worth considering. (Recent revisions not yet checked).	61 x 35.5 x 28cm on matching stands near wall	88dB/W 48Hz	*	46
Goodmans Maxim Two £80	Average+ Average	More wham-bam-thankyou-mam sound that imitates much bigger speakers when you let these babies yell. (A well-controlled yell!)	26 x 17 x 19cm near wall on shelf or stand	86dB/W 85Hz	BB	59
Goodmans Point 3 £90	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 Point 7 £170	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 £300	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 £455	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
Heybrook Point Five £129	Average Average	Disappointingly prosaic performance on listening tests; wooden and hollow, with restricted dynamics and 'space'. Earlier samples sounded better.	37.5 x 23 x 23cm near wall, on matching stands	86dB/W 65Hz		59
Heybrook HB1 £189	Good Average+	No longer an over-bright character, a strikingly clear sound and fine transient performance now merits recommendation.	47 x 29 x 23cm on stands near wall	88dB/W 61Hz	R	46
Heybrook HB100 £250	Average+ Good	Well matched for wall siting, the HB100 is a lively and informative performer in the tradition of the popular HB1.	47 x 26 x 28cm stands near rear wall	86dB/W 50Hz	BB	66
Heybrook HB200 £369	Average Average	This luxury successor to the HB2 is lively and informative, but sounded insufficiently balanced to convince our listening panel.	46 x 23 x 26cm stands against rear wall	87dB/W 55Hz		66
Infinity RS2000 £140	Good Good+	Fast, detailed and assured miniature with quick but not very deep bass. The top end is detailed but sometimes jangly.	36.2 x 22.5 x 20cm near rear wall, high stands	91.5dB/W 70Hz	BB	59
Infinity 6 Kappa £650	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

# THE DIRECTORY

## LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
<b>Jamo Concert 2</b> £240	Good Average—	A thoroughly respectable 'bookshelf' performer that needs free space sitting but includes attractive cabinetwork and a neat grille	41 x 24 x 25cm stands in free space	85dB/W 48Hz		66
<b>JBL L 60T</b> £399	Good + Good	Well balanced and offering realistic value for money, the fine treble and extended bass make it suitable for larger rooms	78 x 30.5 x 26.5cm low stands or floor	88dB/W 40Hz	R	46
<b>JBL L80T</b> £559	Good Average	Large scale, dynamic if rather unwieldy sounding, this is a performer of integrity, if not much subtlety	85.1 x 35.6 x 30.3cm floorstanding, open space	89.5dB/W 55Hz		59
<b>JBL 18Ti</b> £599	Good + Good	Beautifully engineered, well finished miniature with many good points, but unexceptional overall. Try the cheaper L20T	34 x 24 x 22.5cm 50cm from wall on rigid stands	85.5dB/W 53Hz		46
<b>JBL 250Ti</b> £3599	Good + Good +	In general this speaker did not show the required level of dynamic presentation transparency and stereo depth expected of a pricey flagship model	132 x 57 x 36cm free space on floor	89dB/W 53Hz		46
<b>JPW P1</b> £125	Good Average +	Honest and basically articulate if not very sophisticated, resolution is good but it can sound a little wearing in bright systems or with rough sounding material	44 x 25.9 x 26.1cm free space on stands	89dB/W 60Hz	R	59
<b>JPW AP2</b> £145	Good Average +	Few grounds for criticism but purchasers should check out the treble qualities to avoid hammering the ear anvils	46 x 26 x 25cm 40cm from wall on 45cm stands	89dB/W 65Hz	R	53
<b>JPW AP3</b> £210	Good Average +	Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52 x 25 x 29.5cm near wall on stands	90dB/W 57Hz	R	46
<b>KEF R102</b> £335	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
<b>KEF 103/3</b> £630	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
<b>KEF 104/2 (inc KUBE equaliser)</b> £849 (£948)	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
<b>KEF 107</b> £1890	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
<b>Linn Helix</b> £259	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
<b>Linn Nexus</b> £350	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
<b>Linn Sara</b> £749	Good Very Good	The new Sara is now much smoother and sweeter, with much better imaging. Bass power and dynamics are as good as ever, and the system is no longer as fussy as before	43 x 34.4 x 26.5cm stand mounting, near wall	88dB/W 50Hz	R	60
<b>Magneplanar SMGa</b> £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
<b>Magneplanar MG2.5R</b> £1897		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
<b>Magneplanar MG11a</b> £2650	Good Very Good	Another excellent true-audiophile loudspeaker this American panel speaker helps to convey much of the original character of the music	180 x 62 x 38cm well clear of walls	84-86dB/W 35Hz	R	46
<b>Marantz LD20 DMS</b> £150	Average Average	Recommended more for CD users than vinyl keepers, soundly engineered and built but should be heard before bought	36 x 23 x 24cm free space on 45cm stands	86.5dB/W 55Hz		53
<b>MB Quart 390</b> £499	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
<b>Meridian M30</b> £725	Average + Average	Pricy but easy on the ears and worth considering especially where space is at a premium	38.5 x 18 x 32cm free space on stands	Active 40Hz		46
<b>Mission 70 II</b> £100	Good Average	Lively and transparent, the 70 II was favoured for its speed, though the sound had a initially 'thin' tonal balance	35 x 21 x 21cm on stands or shelf near wall	89dB/W 68Hz	BB	46
<b>Mission 761</b> £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
<b>Mission 700LE</b> £140	Good Average	Mission re-submitted this popular model and again got positive review – which proclaims their (and our) consistency	38 x 21 x 21cm straight ahead stand near wall	89dB/W 66Hz	R	59
<b>Mission 762</b> £180	Average Average —	Mission's 'bookshelf middleweight' offers high sensitivity and loudness capability, but at the expense of a somewhat unlit and rather 'heavy' sound	50 x 25 x 27cm stand, experiment advised	91dB/W 55Hz		66
<b>Mission R737 Renaissance</b> £250	Average Average	Effusive, over-the-top bass and obtrusive treble get in the way of a marvellously lucid and transparent midband. Inconsistent on audition – wonderful piano, bloated orchestras etc	54 x 25 x 27cm near wall on dedicated low stands	88.5dB/W 60Hz		59
<b>Mission Argonaut</b> £500	Good Good	Perhaps not the most subtle or sweet these were recommended for their excitement, drama, power handling and... good looks	95 x 23 x 31cm floor-standing near wall	91dB/W 40Hz	R	60
<b>Monitor Audio R100</b> £159	Average + Average —	Tonally quite neutral, but with small box character, negligible low bass and a rather 'hard' midrange	40.5 x 25 x 21cm free space on stands	87.5dB/W 70Hz		46
<b>Monitor Audio R352/MD</b> £300	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
<b>Monitor Audio R452/MD</b> £399	Average Average	This big, efficient, dynamic sounding loudspeaker has a clean, open treble but a pinched, two-dimensional midband. Can be tiring in the long run	64 x 25 x 31.8cm open space, low stands	89dB/W 55Hz		59
<b>Monitor Audio R852/MD</b> £399	Good + Good	This finely crafted design has a sharp and clear if occasionally rather rough sound quality. Bass is light but qualitatively very good – an intriguing performer	45 x 25 x 27.5cm open space or near rear wall, high stands	89dB/W 68Hz	R	59
<b>Monitor Audio R852/Gold MD</b> £450	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
<b>Mordaunt Short MS10 II</b> £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
<b>Mordaunt Short MS100</b> £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
<b>Mordaunt Short 45Ti</b> £230	Good Average	A sensitive tandem-bass number that can be driven loud but loses its balance a bit and can be unsuitable	63 x 26 x 30cm low (20cm) stand near wall	90.5dB/W 52Hz		53
<b>Mordaunt Short MS300</b> £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
<b>Mordaunt Short 442</b> £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
<b>Musical Fidelity MC-2</b> £300	Very Good Very Good	This exceptionally clean and clear design offers real subtlety and finesse. Bass quality is light but exceptionally clear; the treble is smooth if slightly shallow	48.5 x 25.5 x 16.5cm open space and stands	87.5dB/W 65Hz	BB	66
<b>Musical Fidelity MC-4</b> £499	Very Good + Very Good	Achieving a very high standard, the MC-4 sounds detailed and coherent like the MC-2, but with more bass depth and solidity, and large image scale	56.5 x 26.9 x 29cm open space on stands	87.5dB/W 60Hz	R	59
<b>Opus 3 Capella</b> £495	Good Good	The sound of this Scandinavian curiosity certainly benefits from the crushed marble enclosure, though presentation is strictly DIY	32 x 40.5 x 26(ave)cm amongst books in bookcase	86.5dB/W 45Hz		66

## THE DIRECTORY

## LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Quad ESL-63 £1538	Good+ Good++	With its unusual but subtle characteristics this classic electrostatic may not be punchy in the bass, but has strengths that some cannot live without	92 x 66 x 27cm open stand well clear of wall	84dB/W 34Hz	R	60
Rogers LS71 £399	Good+ Good+	A fine combination of classic qualities at reasonable price produces the "R" tag, but try to get a pair home on approval to check for bass 'heaviness'	56 x 27 x 28cm free space on 40cm stands	88.5dB/W 48Hz	R	59
Rogers Studio 1a £565	Very Good Good-	The classic BBC monitor style sound sensitively updated - transparent and natural with fine stereo, but a touch 'heavy' in balance	63.5 x 30.5 x 30.5cm stands in free space	87dB/W 36Hz	R	66
Roksan Darius £1265	Average Poor/Very Good	A controversial speaker which when set up right can deliver impressive performance, but with a far from neutral balance	98 x 31 x 51cm integral stands near side walls	88dB/W 50Hz		53
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 A25 £100	Average+ Average-	Receiving mixed reactions on audition, the A25 is flawed but offers a lot of speaker for the money	51 x 29.5 x 24cm, stands near wall	87dB/W 52Hz	R	46
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
SD Acoustics SD1 £1050	Average Good	A large scale, airy and unusually detailed system with excellent dynamics. Balance is light and bright, and can upset some systems/listeners	123.5 x 38.2 x 31.9cm free standing, away from walls	90dB/W 50Hz	R	60
Sony APM 10ES £100	— Average	An obvious Best Buy at its highly competitive price point, it can do justice to a good hi-fi system of Sony or specialist origins	40 x 25 x 20cm, 40cm stands 40cm from wall	87dB/W 55Hz	BB	59
Sony APM 22ES £249	Good+ Good	Sounding notably clear, the 22ES scored well on listening tests was easy to drive and achieved high sound levels	51.5 x 29 x 30cm free space on 40cm stands	88.5dB/W 46Hz	R	46
Sony APM 66ES £700	Average+ Average+	Powerful heavyweight sound with a brilliant midband - clear articulate and transparent. But the bass is on the bulky side and the treble can sound grainy	66 x 38 x 36.5cm open space, low stands	89dB/W 60Hz		59
Spendor Prelude II £345	Good+ Good	Good clarity and detail were evident everywhere in this speaker. Though a little boxy or muddy in the midrange it is strongly Recommended	50 x 26 x 28cm open stands in free space	88dB/W 52Hz	R*	46
Spendor SP2 £450	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 £680	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 £1400	— Good+	Same as Spendor SA3 active	85 x 38 x 46cm low	89dB/W 32Hz	R	46
Spendor SA3 Active £2708	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 TC-50 £595	Average+ Good	These American wedge-shaped-cabinet speakers were detailed and clear. However, we've not heard the current version with new drive units	40 x 33 x 28cm free space on 50-60cm stands	85dB/W 48Hz	R*	59
Spica Angelus £1195	Good Average	A little bass shy and soft in the bass and lower mid, the Angelus is otherwise tidy, extremely lively and fluid, if uneven overall	116.8 x 53.3 x 26cm free standing away from walls	86.5dB/W 50Hz		60
Studio Power Sapphire £130	Poor Average-	Balance difficulties are improving, though still prevent the potential of this interesting metal-cone new miniature from being fully realised	30 x 20 x 19.5cm stands near rear wall	85dB/W 70Hz		66
Tannoy Eclipse £120	Average+ Good	Although a little bright, the essentials are right: hear-through clarity at all frequencies, good dynamics, firm bass	38.8 x 22.6 x 21cm semi open on stands	87dB/W 65Hz	BB	59
Tannoy Mercury S £160	Good Good	A fine budget allrounder in the now established Mercury tradition, good balance and reasonable refinement will ensure wide appeal	49.5 x 25 x 21.5cm stands in free space	87dB/W 50Hz	BB	66
Tannoy DC2000 £300	Good Good	Remarkably high sensitivity from unique dual concentric driver that has an involving but characteristic sound. Bass could be better	68.5 x 26 x 27cm floor in free space	93dB/W 55Hz	R	66
Tannoy Westminster £3400	n/a Good+	These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge, flat against rear wall, away from corners	96dB/W (manuf.)	R	Coll
TDL Monitor £1600	Very Good Very Good	Fine solidity and good accuracy, with enough bass extension to satisfy even organ freaks. Needs a big room and can sound a bit lazy and a shade tinkly	118.5 x 30 x 47cm 0.5m from walls	85dB/W 28Hz	R	66
Technics SBC 250 £130	Average+ Average-	Despite a fairly even tonal balance, the 250EK sounded muddled in the midrange and dull in character	36.5 x 23.5 x 20.5cm free space, stands	86dB/W 60Hz		46
Technics SB-RX50 £500	Very Good Average+	With its unique coaxial drive unit the RX50 proved a smooth and well balanced loudspeaker, its minor weakness being a mildly excessive low bass	48 x 30 x 26cm free space on 40cm stands	86dB/W 40Hz	R	46
Wharfedale Delta 30 £79	Good Average	Very clear and surprisingly neutral for the price, with good dynamics and stereo within limited volume ceiling	37.9 x 20 x 16.9cm near wall on high stands	88.5dB/W 80Hz	BB	59
Wharfedale Delta 50 £99	Average+ Average-	"There's nothing obviously wrong, but it seems a bit mundane," is what we said when the Delta 50 was £129. But since then the price has dropped by 30 per cent, making it great value	48 x 27 x 19cm near wall on 40cm stands	88dB/W 55Hz		53
Wharfedale Diamond 111 £99	Below Average Average-	This latest version of the long running Diamond sports a better tweeter, but bass, though deep, is soft, and the midband is indistinct and uneven	24 x 18.5 x 20.5cm near wall, stands	86.5dB/W 75Hz		59
Wharfedale Super Diamond £139	Average Average-	Although there are improvements on the basic "legendary" model, listening panelists did not get airborne about this upgrade	24 x 19 x 19cm close to wall at head height	88dB/W 57Hz		53
Wharfedale 505/2 £169	Average Good	This lively Wharfedale provides plenty of speaker with unusual refinement for the money, and should be fairly tolerant of room siting	44 x 25.5 x 24cm stands 1ft from wall	86dB/W 55Hz	BB	66
Wharfedale 510.2 £299	Average Average-	Even in it's latest guise, this loudspeaker still sounds hard, cluttered and lacking innate clarity. The bass is uneven and midband coloured	61.5 x 28 x 29.6cm near wall, high stands	89dB/W 50Hz		59
Yamaha NS 1000M £900	Good Good+	Living up to its monitor label, and tonally well suited to digital material, the NS 1000M is superbly crafted and capable of high levels	67.5 x 37.5 x 32.5cm 30cm from wall, stands	90dB/W 40Hz	R	46

\* rating refers to original, tested model.

To Advertise in  
this space ring Cindy Forde  
on 01-631 1433

# 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
<b>Aiwa AD-F370</b> £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
<b>Aiwa AD-WX707</b> £180	Poor Average	Not bad value for a twin deck, but marginal from the high fidelity viewpoint. The review sample was poorly set up.	Dual deck, auto-reverse, Dolby B & C, bias adjust		57
<b>Aiwa XK-007 Excelia</b> £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
<b>Aiwa AD-WX909</b> £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
<b>Aiwa XK-009 Excelia</b> £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
<b>Akai GX-52</b> £249	Very Good Very Good	Well finished and a pleasure to use this well specified deck sounds clean and defined with all tape groups, with or without Dolby	Dolby B, C, HX Pro, track locate features	BB	57
<b>Akai GX-6</b> £350	Good Good	There is a strong sense that someone has really thought this one through; it has an indefinable 'specialness'	Real-time counter, track search, Dolby B, C, bias adjust	R	52
<b>Denon DR-M07</b> £125	Average + Excellent	Despite minor operational and measured shortcomings, sound quality is excellent for the price	Dolby B, C, bias adjust	BB	52
<b>Denon DR-M10HX</b> £180	Good Good	Very well laid out, a sensible range of features and smooth cam-operated transport. Replay-only sound quality suspect, but the deck is successful as a recorder – clean, precise but slightly 'grainy'	Dolby B, C HX Pro, memory counter, bias adjust	R	63
<b>Denon DR-M12HX</b> £220	Good Good +	Well constructed and pleasant to use, a lack of true pitch constancy kept it from sounding superb	Track search, Dolby B, C, HX Pro, bias adjust	R	52
<b>Denon DR-M24HX</b> £290	Good Good +	This deck will slot into many high grade systems without disgracing itself – or the cassette medium. Very presentable high resolution sound with good stereo with or without Dolby	Dolby B, C, HX Pro, bias adjust, 3 Head	R	60
<b>Denon DR-M34HR</b> £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
<b>Denon DR-M44HX</b> £400	Excellent Excellent	A well designed deck that also performed fine sonically, working very well with ferric and metal tapes	Real-time counter, Dolby B, C, HX Pro, tape alignment adjust, remote control, 3 Head	R	60
<b>Dual CC8010</b> £110	Average Average +	The only limitation worth noting is a slight opaqueness; the Dual otherwise sounds stable and effective. An excellent low-cost design	Dolby B & C, microphone input	BB	63
<b>Harman Kardon CD491</b> £695	Good Good +	Excellent audio engineering and tremendous flexibility make this an audiophile cassette deck 'par excellence'	Real-time counter, auto reverse, track search, Dolby B, C, HX Pro, bias adjust	R	52
<b>Hitachi D-003</b> £130	Average – Average –	Dry, slightly 'wobbly' sound quality but suitable for many non-critical applications. The manual tape direction switch is poorly designed	Dual deck, auto reverse, Dolby B		57
<b>Hitachi D-007</b> £180	Average – Poor	This double 'dubbing' deck proved a mixed bag – good in parts but disappointing overall	Dual deck, auto reverse, track search, Dolby B & C		52
<b>JVC TD-V711</b> £380	Very Good Excellent	This is a complex recorder which is built on the back of some important ideas with audiophile roots. It has a (mostly) superb technical performance and is very capable, if not always strictly accurate	Dolby B, C, HX Pro, 3 Head, variable bias, track search, 3 line inputs	R	63
<b>JVC TD-W222</b> £150	Below Average Below Average	Well endowed but somewhat user-hostile twin deck. Sound quality is very tape dependent, but offers tolerable stability with considerable loss of resolution and scrappy musical presentation.	Dual deck, auto reverse, Dolby B/C		63
<b>Kenwood KX-440HX</b> £140	Average + Poor	Uneven, unstable sounding player with limited resolving power, but good control layout and finish	Dolby B, C, HX Pro, intro scan		63
<b>Kenwood KX-660HX</b> £170	Good Good	Well designed control system with useful search aids. Sound quality is positive and detailed	Dolby B, C, HX Pro, track & blank search, intro-scan, bias adjust	R	63
<b>Luxman K-105</b> £349	Average Average	Rating quite well for an auto reverse deck, and featuring complex track search facilities, it was not sonically competitive on price	Auto reverse, track search, Dolby B & C, remote control		52
<b>Luxman K-112</b> £349	Average Average	Build quality is not truly consistent with the price. Nor is sound, which veers on the warm, lossy side of neutral	Dolby B, C, HX Pro, bias adjust, 3 Head		57
<b>Marantz SD-35</b> £160	Good Good +	Rock steady tape transport gives very competitive sound quality for the price, but the slightly bright replay may not appeal to some	Dolby B & C, bias adjust	R	52
<b>Marantz SD-45II</b> £200	Good + Good +	Well built and dynamic sounding player, working better as a recorder than with musicassettes	Dolby B & C, bias adjust Auto selection	R	52
<b>Marantz CP230</b> £300	Average Average	This is a competitively priced portable recorder though not suited to replay of musicassettes	Dolby B, bias adjust	R	52
<b>Marantz SD-55</b> £349	Good Very Good	Slightly tacky feel and restricted signal/noise performance are the main shortcomings of an excellent sounding piece of kit	Real-time counter, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57
<b>NAD 6300</b> £649.95	Very Good Very Good	Solid and homogeneous sound quality and very good replay compatibility thanks to 'play trim' distinctive, musical – and costly	Dolby B, C, HX Pro, 3 Head, bias adjust	R	63
<b>Nakamichi CR-1E</b> £345	Very Good Good	Modestly equipped by any standards, the CR-1E stands or falls by its build quality, which is high, and sound which is highly competent	Dolby B & C		57
<b>Nakamichi CR-2E</b> £395	Very Good Good +	Ordinary to look at, in some respects rather awkward to use (tape switching especially), the CR-2E sounds very slightly better than the CR-1E, and therefore ranks well. But it doesn't come cheap	Dolby B & C, bias adjust, remote control	R	57
<b>Nakamichi RX-202E</b> £545	Good Very Good +	Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control system	Auto reverse, Dolby B, C, 2 Head	R	63
<b>Nakamichi CR-3E</b> £595	Very Good Very Good	The user interface is a little clumsy, though conceptually straightforward. Sound quality approaches the CR-4E, and is amongst the best at the price	Dolby B & C, bias adjust, remote control	R	57
<b>Nakamichi CR-4E</b> £745	Very Good + Very Good +	High class deck with a reasonably full range of features and superb sound at a slightly unlikely price	Dolby B & C, bias adjust, remote control, 3 Head	R	57

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127



**NEW CAVENDISH STREET WI**

CITY OF WESTMINSTER

**The choice is yours!**

Most equipment featured here has received a "Best Buy" or "Recommended" rating when reviewed in this magazine.

**EXPORT Worldwide**

Send for our Tax FREE price list and general information on how to order.

**MULTI ROOM SYSTEMS**

Stereo in as many rooms as you want. Contact Paul Tam for more information about this service.

**HI-FI CHOICE BEST BUYS**



B200

**SPEAKERS**

Apart from having the best selling range of amplifiers the MF range of speakers is fast establishing itself as a best selling brand

**MODELS/PRICES**

Reference 2	£199
MC 2	£299
MC 4	£499



**AMPLIFIERS**

**MODELS/PRICES**

A1 (20w)	£269
B200 (80w)	£299
A100 (50w)	£459
PR3A Pre-amp	£379
P140 Power (70w)	£349
P172 Pre-amp	£599
P170 Power (85w)	£599
MVT Pre-amp	£1199
P270 Power (135w)	£1299
MA50 Mono blocks	£875
MXV Pre-amp	£2299
A370 Power (185w)	£2299

**ASK ABOUT OUR INTEREST FREE CREDIT**

**TANNOY**

Two models in the Tannoy range have received 'Best Buy' awards in this magazine and it is not difficult to realise why. Their all-round versatility on a wide range of music means they integrate well into most systems. Good dynamics, clarity and firm bass sum up their best characteristics

**MODELS/PRICES**

Eclipse	£1199.00
Mercury 'S'	£1599.00
Manitar M20 Gold	£1999.00



**CD65 Mk 2 Special Edition**

The current Marantz range of CD players keeps winning accolades from the press. The 'special edition' versions of the CD65 and CD75 have been 'tweaked' for extra refined performance. Indeed the CD65 Mk 2 SE was recently voted CD player of the year by What Hi-Fi magazine and enjoys a 'Best Buy' rating in this magazine. Through the range they are excellent machines and to be fully recommended.

**MODELS/PRICES**

CD65 Mk 2 SE	£2999.00
CD75 Mk 2 SE	£3499.00
CD 85	£4999.00
CD94	£7999.00
CD94A D to A converter	£7999.00

**HI-FI CHOICE RECOMMENDED**

**INTERCONNECTS Stereo pairs terminated gold plated RCA phono plugs**

Description	0.5m	0.75m	1.00m	1.5m	2.0m	3.0m	Cable per metre
QED INCON	13.95	—	14.95	16.50	18.00	21.00	1.20
QED INCON (screened)	17.95	—	18.95	19.95	21.95	25.95	1.75
DNM Solid Core	22.90	23.90	25.00	27.25	29.50	34.00	2.30
DNM Solid Core (shielded)	23.50	25.00	26.50	29.50	32.50	38.50	3.00
Deltec Slink	29.00	30.50	32.00	35.50	39.00	46.00	—
Deltec Black Slink	126.00	139.00	152.00	178.00	204.00	256.00	—
Monster Interlink 400	24.00	27.00	30.00	36.00	42.00	54.00	—
Kimber PSB	30.60	33.70	36.80	43.00	49.20	61.60	—
Monster Interlink CD	31.00	37.50	44.00	57.00	70.00	96.00	—
AQ Livewire Ruby	37.00	41.00	45.00	53.00	61.00	77.00	—
Kimber KC1	39.25	46.70	54.20	69.00	83.95	113.75	—
Vecteur 8045	39.00	—	49.00	59.00	69.00	79.00	—
AQ Livewire Quartz	47.00	55.00	63.00	79.00	95.00	127.00	—
Van den Hul D102 Mk2	53.00	59.50	66.00	79.00	92.00	118.00	12.95
Monster Reference	62.00	—	88.00	114.00	140.00	192.00	—
AQ Livewire Emerald	68.00	83.00	98.00	128.00	158.00	218.00	—
Musical Fidelity Lifetime	43.50	46.25	49.00	60.50	72.00	95.00	11.50
Van den Hul Thunderline	89.00	114.90	139.90	189.90	239.90	339.00	—

**SPEAKER CABLES Stereo pairs terminated 4mm plugs (state if other termination required)**

Description	2m	3m	4m	5m	7m	10m	Cable per metre
AQ Livewire BC 2	16.00	18.00	20.00	22.00	26.00	32.00	1.00
AQ Livewire BC 4	20.00	24.00	28.00	32.00	40.00	52.00	2.00
AQ Livewire Brown	26.00	33.00	40.00	47.00	61.00	82.00	3.50
AQ Livewire Type 6	31.00	39.00	47.00	55.00	71.00	95.00	4.00
KIMBER 4TC	76.00	108.00	140.00	172.00	236.00	332.00	16.00
QED 79 Strand	12.50	14.30	16.10	17.90	21.50	26.90	0.90
QED 79 Strand (Flat)	13.70	16.10	18.50	20.90	25.70	32.90	1.20
QED 200 Strand (Flat)	18.50	22.50	26.50	30.50	38.50	50.50	1.95
NAIM NACA 4	19.95	24.42	28.90	33.38	42.34	55.78	2.24
LINN LK20	18.90	22.90	26.90	30.90	38.90	50.90	2.00
DNM Solid Core	19.70	24.30	28.90	33.50	42.70	54.50	2.30
MUSICAL FIDELITY Lifetime	56.00	79.00	102.00	125.00	171.00	240.00	11.50
SUPRA 2.5mm	16.95	19.95	22.95	25.95	31.95	49.95	1.49
SUPRA 4.0mm	20.95	25.95	30.95	35.95	45.95	60.95	2.49
SUPRA 10.0mm	41.00	54.00	67.00	80.00	106.00	145.00	6.49
Van den Hul CS122	37.00	48.00	59.00	70.00	92.00	125.00	5.50
Van den Hul CS352	67.00	93.00	119.00	145.00	197.00	275.00	12.95
VECTEUR 9040 (CV30)	35.00	45.00	55.00	65.00	85.00	115.00	4.99
VECTEUR 8120 (CV90)	99.00	—	—	199.00	—	389.00	—

**BRANDS STOCKED:** Air Tangent, Albarry, Alphason, Arcam, Apogee, Audloplan, Audiolab, Audio Research, Avance, Beard, B & W, Cambridge, Croft, Celestion, DNM, Denon, Dual, Epos, EAR, Foundation, Goldmund, Harbeth, Heybrook, Jadis, KEF, Koetsu, Kisaki, Kinergetics, Krell, Kuzma, Linn, Lnx, Magneplanar, Martin Logan, Manticores, Marantz, Meridian, Michell, Militek, Mod Squad, Musical Fidelity, NAD, Naim, Nakamichi, Nitty Gritty, Oracle, Pink Triangle, PS Audio, Quad, QED, Rata, Revox, Revolver, Rotel, Rogers, Stax, SD Acoustics, Sonus Faber, Spica, SME, Sumo, Slate Audio, Systemdek, Tannoy, Voyd, Wharfedale, Yamaha, Zeta.



K.J. WEST ONE Dept. HC2  
26 NEW CAVENDISH STREET,  
LONDON W1M 7LH

Telephone: 01-486 8262/8263

Fax: 01-487 3452

Open: Monday-Saturday 10am-6pm  
Thurs until 7pm

**MAIL ORDER** - Post/Packing/Carriage  
£1.65 per order (over £35 Post Free) UK  
mainland only. Overseas and off-shore by  
quotation. Telephone orders are welcomed if  
customers are paying by credit card.



# THE DIRECTORY

## CASSETTE DECKS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>Nakamichi CR-7E</b> £1500	Excellent Excellent	Remarkably this deck is not only ergonomically but also sonically superior to the Dragon, particularly on record/replay	Real-time counter, track search, Dolby B & C, tape alignment adjust, bias adjust, remote control, 3 Head	R	60
<b>Nakamichi Dragon</b> £1750	Excellent Excellent	Previous to the birth of the CR-7E, this machine stood head and shoulders above the rest. It is still the ultimate for music cassette replay	Auto reverse, Dolby B & C, tape alignment adjust, bias adjust, remote		60
<b>Onkyo TA-2120</b> £120	Average + Good	Clear, vivid sound with good timing and resolution when using Type II tapes without Dolby. The controls are less inspiring – the meters in particular are plainly inadequate	Dolby B/C, auto tape sensing, block/ side repeat	R	63
<b>Onkyo TA 2130</b> £140	Average + Average +	Rating fairly well on both pre-recorded and record/playback, ergonomics were a little poor but overall performance was generally consistent	Track search, Dolby B & C, bias adjust		52
<b>Philips FC566</b> £179	Average + Average +	Mostly well equipped, though some tape search facilities fail to exploit the auto-reverse capability. Sounds clean and stable – with prerecorded tapes too	Auto reverse, track search, Dolby B & C		57
<b>Philips FC567</b> £279	Average Poor	Well equipped but ergonomically substandard; sound quality is messy and lacking in clarity and dynamics	Dual deck, auto reverse, track search, Dolby B & C		57
<b>Pioneer CT-443</b> £180	Average Good	Structurally sound and subtly musical recorder. Sophisticated, mildly damped sound quality	Dolby B & C, fine bias adjust, track search	R	63
<b>Pioneer CT-737</b> £300	Average – Average –	Interesting design and a pleasure to use with rather too many rough edges to really work properly	Dolby B, C, HX Pro, 3 Head, bias adjust, memory counter		63
<b>Proton AD-200</b> £140	Poor Poor	Sound quality is essentially on a par with many portables, and has nothing to do with high fidelity. The main problems are an unrelenting hardness and an almost total lack of detail	Dolby B & C		57
<b>Proton AD-300</b> £200	Average – Poor	High levels of flutter give sound a roughness and coarseness that rules it out for high quality work. The record and replay electronics certainly deserve better	Auto reverse, Dolby B & C		57
<b>Revox B215</b> £1461	Good Average +	Superb engineering and good sound, but lacking the subjective qualities that characterise the very best hi-fi equipment	Real-time counter, Dolby B & C, tape alignment adjust, remote control		52
<b>SAE C102</b> £549	Average + Good	Looking most unlike a cassette deck designed in the States and proving competitive in its price group. Not sonically that outstanding, however	Real-time counter, track search, Dolby B & C		52
<b>Sony TC-FX 150</b> £90	Average + Average +	Recording and playing back on this deck itself gave acceptable results, whereas prerecorded stuff was a joke. But it's a good £90 worth	Dolby B & C		52
<b>Sony TC-W300</b> £150	Poor Poor	Deeply unimpressive and messy sounding deck with bloated quality and poor pitch integrity. Dubbing performance substandard	Dual deck, Dolby B & C		63
<b>Sony TC-RX50</b> £180	Average – Poor	Terminal inability to play at a steady pitch, (or on prerecorded material) in tune spoiled this simple but otherwise attractive design	Auto-reverse, Dolby B/C/HX Pro		63
<b>Sony (WMD6C) ProWalkman</b> £249	Good + Excellent	"One of the finest sounding cassette decks on the market today. A mandatory Best Buy, which also fits in your pocket!"	Dolby B, & C	BB	60
<b>Sony TC-RX60ES</b> £250	Average Average	For once a stable sounding auto-reverse deck but sound quality is rather 'dirty' and compressed, especially with Dolby C	Auto-reverse, Dolby B/C/HX Pro, auto tape recognition		63
<b>Sony TC-RX80ES</b> £350	Average + Good	Clean, powerful and detailed sound, especially without Dolby C. Stable pitch – but prerecorded cassettes sounded disappointing	Auto reverse, Dolby B/C/HX Pro, bias/ level adjust	R	63
<b>Sony TC-K700ES</b> £499	Excellent Excellent	Firmly in the esoteric league, this is easy both to operate and to listen to. Best points: first class imagery, focus and stability	Auto reverse, track search, Dolby B & C, tape alignment adjust	R	60
<b>Tandberg 3014A</b> £1650	Good Very Good	Very exactly engineered but excessively complex to use. Test sample had poor response for prerecorded tapes, but recordings were unusually stable and clean	Real-time counter, track search, Dolby B & C, bias adjust, remote control, 3 Head		57
<b>Teac V-250</b> £89	Average Average	Ultra-basic design which works quite well. Lack of pitch integrity is the main shortcoming, but it wasn't always noticeable	Dolby B	R	63
<b>Teac V-270C</b> £109	Average – Average –	Not quite cheap enough to compete solely on price, the V-270C is a rather messy and unstable sounding deck	Dolby B & C, bias adjust		63
<b>Teac R-515</b> £299	Average + Average +	Expensive, this deck is basically a competent but pedestrian performer which will not fully satisfy the critical user	Real-time counter, auto reverse, Dolby B & C, bias adjust		57
<b>Teac V-870</b> £399	Good + Good	Cut-down V-970X for the proletariat. Expensive and carefully engineered with mostly very good but slightly cold sound quality	Dolby B, C, HX Pro, 3 Head, manual tape calibration	R	63
<b>Teac V-970X</b> £499	Very Good Very Good	An excellent sounding deck with useful features (tape calibration etc) that fully justifies the price	Real-time counter, track search, Dolby B/C/dbx & Dolby HX Pro, bias adjust, remote control, 3 Head	R	57
<b>Technics RS-T230</b> £160	Average – Average	Satisfactory with prerecorded material but otherwise unexceptional, the main features of this deck are its excellent user interface and value for money	Dual deck, Dolby B/C		63
<b>Technics RS-B355</b> £140	Good Good	Good sound let down by inadequate meters and poor prerecorded replay only sound quality	Dolby B, C, microphone inputs, cue and review	R	63
<b>Technics RS-B505</b> £160	Average + Average +	Neatly made recorder with Dolby HX Pro that sounds precise and stable, though sometimes a little processed and grainy too	Track search, Dolby B/C/HX Pro		57
<b>Technics RS-B605</b> £180	Good Average +	Mixed but generally good sound. Weakest points are dbx and prerecorded sound, best are Type IV (metal) recordings which sound sharp and precise	Track search, Dolby B/C/HX Pro & dbx		57
<b>Technics RS-T330R</b> £200	Average + Average +	One of the very few dual cassette decks with any real pretensions to audio quality, the RS-T330 is a considerable success musically as well as being a pleasure to use	Dual deck, Dolby B & C	R	63
<b>Technics RS-B705</b> £250	Average Average –	3 heads for the price of two, but not the sound quality to go with them	Track search, Dolby B, C, HX Pro, bias adjust, 3 Head		52
<b>Technics RS-B905</b> £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
<b>Technics RS-T80R</b> £400	Poor Poor	Flexible and pleasant to use but poor transports led to poor sound on our latest sample	Dual deck, auto reverse, track search, Dolby B, C, dbx		52
<b>Yamaha KX-200</b> £120	Good – Good	Cheap, well-equipped and workmanlike with the sound quality less obviously processed than most – the whole is more than the sum of the parts	Track search, Dolby B & C, remote control	R	52
<b>Yamaha KX-300</b> £150	Average + Average –	Uncommonly well equipped and adequately made and presented, this model turned out to be a disappointingly uncertain proposition on audition	Track search, Dolby B, C, HX Pro with 'play trim', bias adjust, remote control		57
<b>Yamaha KX-400</b> £200	Good Good +	A highly commercial package with every widget under the sun. Happily it sounds good too	Auto reverse, track search, Dolby B, C, HX Pro, remote control	R	52
<b>Yamaha KX-500</b> £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
<b>Yamaha KX-800</b> £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
<b>Yamaha KX-1200</b> £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

# THE DIRECTORY

## DAT RECORDERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>Aiwa Excelia XD-001</b> £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
<b>Luxman XD-117</b> £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
<b>Pioneer D-1000</b> n/a	Excellent Excellent	Fine, clear, colourful and consistent sounding deck. The Pioneer is lavishly (uneconomically?) constructed and equipped. It shows what is possible, but will probably never go on sale	Many search and memory facilities	R	63
<b>Sony DTC-M100</b> £799	Very Good Very Good	Clean, clear sounding 2nd generation model with most of the features and sound of the DTC-1000ES	Mid-width, alpha-numeric display, remote, optical interfaces	R	63
<b>Sony DTC-1000ES</b> £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
<b>Acoustic Research CD-04</b> £290	Good Fair	Stylish but basic player, based on Philips 14-bit 4 x oversampling with respectable sound and remote control	Remote Control, headphones		51
<b>ADC CD-250X</b> £230	Good + Fair	Well made and engineered, and average soundwise, trumpets could sound 'thin' though violins were liked so it may prefer <i>Stephan Grappelli</i> to Miles Davis	Skip and search, manual, repeat and 16-track programming		58
<b>ADC CD 2000E</b> £330	Good + Fair +	One of the slimmest players in the business but nothing special inside. Nice ergonomics but overpriced	Remote, timeshared 16 bit		64
<b>Aiwa DX-M45</b> £149	Fair Fair	Cutdown Philips technology, but results are quite good for this British made machine	Manual	R	64
<b>Aiwa CD-001</b> £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
<b>Aiwa XC-007</b> £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
<b>Akai CD-52</b> £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
<b>Akai CD-73</b> £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
<b>Akai CD93</b> £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
<b>Arcam Delta Black Box</b> £249	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
<b>Arcam Delta 70</b> £500	Good Very Good	This solidly built British player has attractively understated presentation with straightforward, simple ergonomics. The very good sound quality shows a steady improvement over earlier samples	Simple remote, headphone socket etc.	R	58
<b>Cambridge Audio CD2</b> £150	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
<b>dxX DX5</b> £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
<b>Denon DCD 610</b> £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
<b>Denon DCD 810</b> £250	Very Good Fair +	A good value allrounder bettered on sheet value by the 610 and 910, power volume could sound better	Remote, digital output, programming	R	64
<b>Denon DCD 910</b> £300	Very Good Fair +	A well equipped deck of impressive appearance and solid sonic and lab performance	Remote volume, programming, 8x 0/S	BB	64
<b>Denon DCD-1500II</b> £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
<b>Denon DCD 1700</b> £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
<b>Denon DCD-3300</b> £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
<b>Dual CD 1030 RC</b> £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
<b>Ferguson CD007</b> £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
<b>Ferguson CD008</b> £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
<b>Goodmans GCD550</b> £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
<b>Hitachi DA-7000</b> £150	Good Fair	Generally competent, especially considering the price, this was well built and styled if lacking in some facilities – a good budget starter	Memory and repeat, plus the basics		58
<b>JVC XL-2444</b> £255	Good Fair +	An average performer, unremarkable though well equipped and fair value for money	Full feature remote, digital output, headphone socket		64
<b>Kenwood DP-660SG</b> £180	Below Average Below Average	Build quality and ergonomics are good, and the range of features far exceeds the price norm. However, sound quality is messy with a soft bass, recessed mid and sometimes spiky top	Remote control, calendar/menu display, keypad, 20 track memory		62

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127

# THE DIRECTORY

## CD PLAYERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Kenwood DP-880SG £250	Very good + Fair +	A fine CD transport for the price, fine sound, very good lab results, good for a decoder?	Remote volume, programming, headphone socket	BB	64
Kenwood DP-990SG £400	Very Good Good	Falling just short of the required subjective standard for Recommendation at this price level, this is a doughty player nonetheless, with a build quality and technical performance that arguably justifies its premium price.	Track entry remote, menu display, sprung feet etc.		58
Kenwood DP-1100SG £450	Very Good Good	Something of a high tech flagship, this model doesn't quite make the grade on sonic grounds but is well built	Full remote, optical and coax digital outputs, headphones		64
Kinergetics KCD-30 £1700	Very Good Very Good	Definitely a technical oddball with its distortion-cancelling circuits, the pricey KCD-30 nevertheless does sound very good, and also noticeably 'different' – not necessarily to our collective tastes, but possibly to your's	Favourite track selection, remote, high output (vol, bal)		60
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 CD65IISE £300	Very Good Very Good	Scorching sound quality from a competitively priced player, which is the new middle market reference	Remote, programming, digital output	BB	64
Marantz CD94 £800	Good + + Very Good	Clearly the best Marantz CD player, with high build quality and good objective and subjective performance	10 digit keypad, headphone socket, favourite track selection, remote	R	58
Marantz CD94/CDA94 £1600	Very Good Excellent	Taking its logical place at the top of the Marantz CD hierarchy, this two-box combination delivers reference standard lab and listening test results, albeit at a price which seems a little steep. Very refined	Favourite track selection, remote, balanced output etc	R	60
Meridian 207 £950(+)	Very Good Excellent	Not only arguably the prettiest model around, but also one of the best sounding and most versatile – on-board preamp now accepts vinyl disc for an extra £100, and Meridian plans round-the-house future-readiness	On-board preamp, remote (inc volume)	R	64
Mission PCM2 £690	Good + Good	A matured design with good features it is the best sounding power volume player available, it even tests well. It accepts the £200 PSX power supply option	Remote volume, display and phase invert	R	64
NAD 5220 £230	Average – Poor	Conforms sonically to a stereotype of the medium that most players have grown out of. Hard, thin and raw sound with poor stereo and resolution.	Time/track display, memory		62
Nakamichi OMS-1E £400	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 OMS-3E £995	Good Good	Superbly built and presented this expensive machine was a bit of a "stuffed shirt" when it came to sound quality	Remote control, skip and scan, headphone socket		51
Nakamichi OMS-4E £1200	Very Good Very Good	Solidly controlled and comparatively simple this clearly represents one of the major benchmarks for CD sound quality, though the midrange sounded a touch thin	Skip and scan, headphone socket		51
Nakamichi OMS-5EII £1500	Good + Very Good	"... delivers near state of the art performance and build quality in a deliberately starkly functional package, but at a very high price..."	Skip and scan, simple track programming, manual control		51
Nakamichi OMS-7EII £2000	Good + Good	The only serious criticism here is of the price. And in our not always humble opinion you can get better sound quality for less elsewhere in Nakamichi's range	10 digit track entry keypad programming, headphones		51
Onkyo DX-1500 £170	Average Fair	Ruled out on the grounds of its poor DAC filter, but it's not so bad really given the price	Manual, 2x 0/S, timeshared 16 bit		64
Onkyo DX-2500 £200	Average – Above Average	Attractive, easy on the ear sound quality at the cost of some loss of low level clarity and dynamics. Good tracking	Keypad remote, memory, headphone socket (variable)	R	61
Philips CD473 £250	Good Good	In the forefront as regards sound quality, this is one of the best sounding Philips players yet; we were unable to catch it out on classical through Jazz program	Favourite track selection, remote control with volume, headphones etc	BB	58
Philips 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 PD-6100 £249	Good Good	A budget audiophile player; fine sound even if its lab performance seems a little uneven	Full feature remote, digital output, variable hdgh	BB	64
Pioneer PD-M500 £269	Good Good	A high performance autochanger for the money, good value all round and generously featured specification	Full remote, digital output, variable hdgh	BB	64
Pioneer PD-M700 £400	Very Good Fair +	Top class autochanger, surprisingly fast, high specification and a good allrounder	Remote, optical digital output, headphone socket		64
Pioneer PD-91 £800	Excellent Excellent	Close to state of the art in nearly all areas – soundstaging, clarity and simple lack of artificiality. A well made and sophisticated player	Track entry remote, calendar display, index search, etc.	R	64
Revox B226 £658	Good + Good	The traditional Revox house style is combined with the fine Philips 16 bit chip set, but this player doesn't really offer sound quality to match the price	Infra-red remote control, full search, scan, programming		51/Coll
Rotel RCD820B £210	Good + Fair +	A budget Philips based player of dependable sound quality and offering very good value. Build is a touch lightweight	Remote, basic facilities	BB	64
Rotel RCD820BX2 £250	Good Very Good	Start with a good base and then make it sound better, the '820BX2 CD player maintains the reputation established by its namesakes, and comfortably deserves Recommendation.	Direct track entry remote etc.	R	58
SAE D102 £700	Good Good	Considering the high price of this player, most of the innards seem fairly prosaic. Sound quality and lab performance are both respectable enough, but hardly justify the price premium involved, though styling is unusual.	Remote (inc volume), skip, scan etc		58
Sansui CD-X50Ti £300	Fair Fair	Weak dynamic range for an upmarket player which shows in both lab and listening tests	Remote, programmable, digital output, headphones		64
Sharp DX-620 £199	Good Good	A surprising achievement but it shows what can be done. Another high value budget package	Remote, headphone output, 2x 0/S, timeshare 16 bit	BB	64
Sharp DX-R700H £225	Average – Poor	A workmanlike player that does not offer exemplary lab or sound quality but which is well-built with good facilities and should perform well in use	Remote control, track selection keypad, skip, scan repeat programming		53
Shure Ultra D6000 £495	Average + Fair	Ergonomically well thought out with full function remote control, but not really scoring sonically considering its price	Remote control (full function inc volume)		51
Sonographe SD1 (by CJ) £799	Good Very Good	Distinctive with oak end-cheeks, using Philips based 14 bit x 4 oversampling, Conrad Johnson electronics make this a musically rewarding player	Full search programme and timing	R	51/Coll
Sony CDP-M35 £170	Fair Fair	There is no disguising the lightweight plastic construction of this player, but the technical performance, sound quality, aesthetics and ergonomics all deliver more than one has the right to expect for £170	Skip, scan, programming etc	R	58
Sony CDP-M55 £190	Fair Fair	£20 buys a remote control handset to operate your M35. Sony call it an M55 (see CDP-M35 review).	Simple remote, skip, scan, programming etc.	R	58
Sony CDP-550 £200	Good + Fair +	Another dependable Sony, it doesn't have a digital output but at the price who's complaining? Fit and forget	Full remote headphone output, 4x 0/S	BB	64
Sony CDP-M75 £230	Good Good	This midi version of the '750 saves £20 on the price (see CDP-750 review)	Track entry remote, menu display ect	BB	58
Sony CDP-750 £250	Good Good	A seductive blend of fine presentation and solid performance, all at a very realistic price that should ensure its success.	Track entry remote, menu display etc.	BB	58

# THE DIRECTORY

## CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
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 hdp output	R	64
Sony CDP-337ESD £550	Good Very Good+	Well built, high grade player with excellent if undemonstrative sound. Excellent resolution, dynamics and bass weight, though arguably not control	Random access remote, calendar display, FTS, memory	R	61
Sony 557ESD £1000	Excellent Good+	Superbly built flagship model that produced excellent lab results and very good sound. Many luxury features though not that good value	Full remote, disc directory, digital output, power volume, 8x O/S, 18 bit		64
Teac PD135 £180	Fair Fair	Particularly easy to use, this lags a little behind the pack when it comes to sound quality, but it still represents a valid alternative for those who find the presentation attractive.	Skip, scan, programming, repeat.		58
Technics SL-P350 £250	Very Good+ Good	Nicely built, good features and fine sound, what more do you want for £250?	Remote, digital output, variable hdp output	BB	64
Technics SL-P770 £350	Excellent Good	Sophisticated, high resolution player, but inconsistent with level with some coarseness and compression during loud passages	Remote, 18 bit, rotary cue wheel, comprehensive display	R	61
Technics SL-P990 £450	Excellent Good	An obvious technical tour de force, with ample engineering and build quality to justify the price, but some subjective reservations nonetheless.	Track entry remote, menu display, search dial etc.		58
Technics SL-P1200 £800	Good++ Good	Looking more like a desk workstation than a stackable component, this will appeal to the creative recordist and semi pro user. Sounded pretty good	Headphones, remote control, search dial cueing, etc		51
Toshiba XR-9318 £150	Good Fair+	A basic Philips based player perhaps but just look at the price/performance equation	Remote via system, manual, non oversampled, 16 bit	BB	64
Toshiba XR-9128 £200	Very Good Good	A well equipped Philips clone with a very good performance for the price	Remote, programmable, digital output, hdp	BB	64

## TUNERS

The radio medium operates at a much lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live Prom concerts can rival all other sources from a hi-fi perspective. Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for receiving certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen amplifier

cosmetically. However, the task they carry out is far from simple (or cheap), combining the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on local reception conditions, but money invested in a high quality outside aerial system is well spent.

Tuners come in two basic types. Analogue models tune gradually (and usually manually) across

the bands, and can have analogue or digital displays; they are often preferred for sound quality, and are certainly best for AM bands. Digital tuners offer convenient automatic tune facilities and hold many station positions in pre-set memories.

(The Lab and Sound results for models tested in issue No. 65 refer to FM only. For AM results see under Comments.)

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai AT-52L £150	Very Good Very Good	Holds its own on FM against many much more expensive tuners, but AM is very poor	All bands	BB	65
Akai AT-93L £250	Good+ Good+	By AM standards presentable (good) while FM delivers the goods	All bands, aerial switch	R	65
A&R Arcam Alpha £149	Good Average++	Attractively classic British analogue tuner with sound quality comfortably better than most	FM/AM Analogue	BB	50
A&R Arcam Delta £270	Very Good Very Good	Hi-fi sound on FM, good on AM, a dependable British all-rounder	6AM, 6FM presets. FM/MW. LW display manual tune	BB	55
Creek CAS3140 £150	Very Good Very Good	A true front-rank tuner, excellent ergonomics and audiophile sound quality albeit with the minor handicap of having FM only	FM only	BB	50
Denon TU 450L £130	Average+ Average+	Poor AM sound quality may be a deterrent but the FM performance fully merits recommendation	FM/AM Digital	R	50
Harman Kardon TU920 £299	Good Average	Rather weak sound quality for the price despite good lab test results	16 presets, AM/FM, digital auto scan, active tracking		55
Harman Kardon Citation 23 £559	Good Very Good	Fine performance, interesting features and ease of use are this tuner's forte, and the sound quality is top notch	FM/AM seek/manual adjustment muting 16 presets remote control	R	60
Hitachi FT-MD 5500 £200	Excellent Good++	A powerful, good sounding tuner with versatile facilities	16 presets, FM, AM, MW auto scan digital, signal meter	BB	55
Hitachi FT5500 II £200	Very Good Good+	Soundwise highly rated on FM, and on AM basically satisfactory - a versatile all-rounder	Auto and manual tuning. 16 presets	R	44
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
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 £495	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 4020B £139	Good Average+	Not the quietest or most sensitive tuner tested, it still provided good sound for the money, being "musical and ambient"	Analogue FM/AM	BB	50
Naim NAT 01 £1098	Very Good Very Good	There may be better sounding tuners in the world, but we have yet to hear one	No presets. Two box, flywheel tuning FM only, Analogue	R	50
Nakamichi ST-7E £750	Good++ Good+	Exceptionally good for weak-signal areas, and good all round	16 AM/FM presets, Schotz enhanced sensitivity, auto time digital		55
Pioneer F551L £100	Good+ Good+	High value budget tuner, very little to argue about (includes long wave)	12 FM, 12 AM presets, auto scan, digital and signal strength meter	BB	55
Pioneer FT 443L £130	Poor Poor	The pretentious 'computer controlled' features don't amount to much. AM - very poor	All bands		65
Pioneer F-737 £230	Good+ Good+	Terrific separation and selectivity on FM, but AM still lacking. AM - fair	FM/MW only	R	65
Pioneer F91 £350	Excellent Good++	Easy to use, this model has excellent RF performance and scored very high ratings on the listening tests	FM/AM 24 presets	R	60
Proton AT-300 £199	Good Good	The AT-300 is pretty on the outside, orthodox on the inside and rather dear. AM - poor	FM/MW only	R	65
Quad FM4 £289	Very Good Good+	Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7 presets. Digital	R	50
Revox B260 £918	Excellent Very Good	Sophisticated and expensive, the B260 is ideally suited to the rest of the Revox range and should also work well in other systems	FM - virtually everything	R	60

# THE DIRECTORY

## TUNERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Rotel RT-830AL £110	Good+ Good	Fine sounding budget audiophile material, no frills, no fuss	Manual dial analogue, FM, MW, LW	BB	55
Rotel RT-850AL £160	Good+ Good+	Scoring well on listening tests and one of the best sounding tuners at its price level, it was a bit let down on AM but RF performance was good	FM/AM, digital	BB	50
SAE T-102 £449	Good+ Good+	Expensive for all the radio you get, but sounds interesting. AM - Poor	FM/MW only	R	65
Sansui TU-D99XL £249	Very Good Good+	This slimline compact model gave good FM sound quality and strong RF performance. But the AM sounded unpleasant	FM/AM, 16 presets	R	50
Sony ST-S300L/ ST-S100L £140/£100	Good Good	A reasonable entry point, not for difficult areas. AM - Poor	All bands	R	65
Sony ST 500ES £200	Good+ + Average-	Disappointing sound quality but good lab performance. (Includes long wave)	10 AM/FM presets, auto scan digital		55
Sony ST-S 700ES £299	Very Good Very Good	First class in every respect including FM sound quality. Even AM was well above average	FM/AM, 10 presets, digital scan	BB	60
Yamaha TX-L400 £130	Good+ + Good+	Good FM sound, let down by poor AM but otherwise good value	16 presets, auto scan, digital, FM, MW, LW	BB	55
Yamaha TX-500 £150	Average+ Average	Under a gaudy coat, this sensitive tuner gave reasonable stereo results. However, the AM had again been thrown down a well	20 presets (10 buttons) digital		50

## CD MIDI SYSTEMS

So you want a hi-fi, but you don't want to make a fuss about it. A pre-packaged system with everything matching up and no aggravation may not rank with carefully chosen separates on **sound quality**, but there's no denying the attractiveness or popularity of this approach - the market for pre-packaged component hi-fi systems is at least as big as that for separate items, even ignoring the vast numbers of low-cost single unit stacker systems.

The arrival of compact disc led to a new fashion for shelf-standing compact systems, or 'midis' as

they are known in the trade, as a replacement for earlier floor-standing rack systems (themselves the upmarket development from music centres). Only some 330mm wide, midis can more or less match full-size (430mm) rack components for performance, and are certainly cheaper to make, ship, sell and buy.

Whereas specialist hi-fi is moving steadily towards ultra-simple 'no frills' components, midi systems tend to be sold on a feature count at a price point, usually with little opportunity for

demonstration and comparison. Our test programme includes extensive auditioning and lab testing, while making allowance for the different aspirations of designers and expectations of users. Key features valued highly by customers include system remote control, automatic switching, double 'dubbing' cassette decks, and elaborate equaliser tone controls. And the top end of the market is developing with surround sound audio/video-ready packages.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa X-55 £380	Average Average-	The turntable was slightly better than usual, the cassette deck highly limited, but the dreadful loudspeakers are the clincher	Combined cassette tuner-timer/amp, dedicated T/T speakers, & optional CD		65
Aiwa X-78 £550	Average+ Good	Good. The loudspeakers are disappointing and the turntable is excessively microphonic, but the rest of the system works well.	Auto reverse cassette/tuner/amp & timer, T/T and CD	R	65
Aiwa V1500DX £999	Good Good	Remarkable features level even includes independent record feeds to each cassette. High class build, satisfying sound, but best without loudspeakers	Separates system, twin auto-reverse cassette, full remote, timer	R	54
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
Goodmans 5300CDM £400	Average- Average+	Crisply styled system with gutsy amplifier and sophisticated speakers. CD player works well, other sources are variously mediocre	Combined cassette/tuner/amp, plus T/T and CD with remote	R	65
Goodmans Maxim-Midi System £520	Average Average+	De-luxe version of 5200 system - very good value for money and readily upgradeable. Sonics rough but OK and speakers good; CD crude	All separates with twin cassette	R	54
JVC Midi-W900CD £1000	Good Good+	A competent allrounder, with important convenience related features, and powerful linked recording facilities. Less strident speakers would be appreciated	Separates system, equaliser, auto-reverse cassette	R	65
Marantz MX583 £750	Below Average Poor	The system has potential in an A/V context, but is patently lacking in a purely audio one. Only the CD excels	Component system with A/V amp, no speakers		65
Marantz MX673CD System £900	Average+ Average	Tremendously flexible audio/visual system. Sound quality is satisfactory at best and ergonomics a mess	Various A/V inputs, remote, speakers optional		54
Philips F777 £850	Good Good	Excellent CD player, tuner and amplifier, offset partly by poor cassette deck and turntable	Separates system, optional remote, no speakers		65
Pioneer System 300 £1000	Very Good Very Good	Sharp, articulate and powerful system that works. The turntable is a weakness as usual, but the only real weakness in an uncommonly sophisticated package.	Remote separates system, optional multi-disc CD	R	65
Proton AI-3000 £550	Good Good	There are a host of minor problems, including no LW, but the unit is attractively packaged and can be made to sound very good despite a woolly sounding amplifier	One piece CD, cassette, tuner and amp, remote	R	65
Sanyo System 22 £350	Average Average+	Some careful detail design has given this system sound quality out of keeping with ordinary appearance. More than the sum of its parts	Single piece, plus speakers	BB	65
Sanyo W40CD £380	Average Average	Low cost, no options package with attractive displays, cassette had high wow and flutter, but the rest worked OK	Semi auto T/T, auto record start, twin cassette	R	54
Sanyo System 33 £400	Average Average+	Similar to the 22, and better when extended, but the price (and value) advantage is dissipated.	As 22, separate T/T, remote	R	65
Sharp SA-CD800H £700	Average Average-	A superficially high grade, high spec system, the SA-CD800H actually sounds clean but a little 'synthetic'	One-piece, 6-disc CD, no T/T		54
Sony Compact 350CD £480	Average- Average-	Visually stunning appearance hides very basic audio attributes, the turntable and cassette deck suffering severe pitch related shortcomings. CD is too expensive in this company.	Integrated one piece, (ex CD), 5 disc non-cartridge player		65
Sony Compact 500CD £550	Average+ Average+	Impressive visuals are matched to electronics which in audio terms lack inspiration. The speakers are particularly poor	Combined amp/cassette, 36 preset tuner, T/T component CD		65
Sony Compact 700CD £700	Average+ Good	Loudspeakers and (to a lesser extent) turntable spoil a fine sounding and stylish - if rather costly - package	Separates system, auto reverse cassette, 36 preset tuner		65
Sony Series 1000CD £1500	Very Good Excellent	Very sharp, articulate sounding system from CD and FM. Cassette deck good and flexible, turntable as usual is not in keeping	Separates system, twin auto-reverse cassette, amp with DAC	R	65
Technics X900CD £470	Average Average-	Good build and mostly good sound is offset by mediocre amplifier and loudspeaker and some operational oddities	Main cassette/tuner/amp, separate T/T and CD		65

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127

# THE DIRECTORY

## CD MIDI SYSTEMS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Technics X950 System £850	Good Good	Fine sound from CD, FM and AM radio and cassette. The record deck is a little better than normal too, but the loudspeakers are disappointing	Component based, CD, twin auto-reverse cassette, tuner, auto T/T, amp and speakers	R	65
Technics X990D System £1250	Good Very Good	Powerful, flexible and well built system – loudspeakers apart. Even the turntable is on the rough side and the loudspeakers should be changed if possible. The rest of the system is A1	Twin deck, programmable T/T, amp, CD, speakers	R	65
Toshiba V17CD £370	Average Average+	Loudspeakers are the weak link, with cassette and turntable also indifferent. Tuner and CD worked well though, so reasonable value for money	Twin cassette, semi-auto T/T	R	54
Toshiba V18CD £400	Poor Poor	Neat and simple to use basic system with good CD but poor elsewhere and abysmal loudspeakers	Integrated amp/cassette deck, other components separate but dedicated		65

## HEADPHONES

There are a variety of different approaches to headphone design, and examples of each turn up in this group. Amongst the more expensive esoteric models, electrostatic drivers are used in square open-backed phones such as the Jecklin and Stax models. The majority of these come with some form of transformer which takes the signal initially from the speaker terminals on the amplifier. The actual speaker cables then travel from this unit via a

bypass switch to the loudspeakers.

The more down to earth models feature dynamic drivers in circular open-backed designs. The advantage of open backs seems to be a correspondingly open sound and a less claustrophobic feel to the music. One can also of course hear external noises and irritate people on public transport.

The third category are closed-back designs,

which are useful in situations where it is necessary to block out background noise.

Another means of distinguishing different types is the way they sit on your head or ears. There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs press on the outer ear (pinna); and intra-aural types rest inside the ear and are popular amongst users of personal stereos.

NAME PRICE	SOUND COMFORT	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Aiwa HP-X8 £49	Good Very Good	Very slick Walkman oriented phones which are tonally well balanced and go loud without becoming painful	Supra-aural, closed-back, dynamic	R	63
Aiwa HPEX-200 £90	Good Good	Modern looking and well finished the Excelsias, as they are dubbed, had meaty bass and sounded reasonably open for the type	Circumaural, closed-back, dynamic		63
AKG K135 £35	Fair Poor	Despite a very appealing design the K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural, semi-open, dynamic		63
AKG K240 Monitor £60	Good Very Good	Something of a classic these AKGs are very user friendly in all respects; sonically on the warm side of neutral	Circumaural, semi-open, dynamic	R	63
AKG K280 Parabolic £110	Very Good Good	A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural, open-backed, dynamic	R	63
Audio Technica ATH 909 £55	Average Average	Quite impressive in the treble though a bit bass shy, the 909s worked well at highish levels	Circumaural, semi-open, dynamic		55
Audio Technica ATH 910 £65	Good Average	The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural, closed-back, dynamic	R	55
Audio Technica ATH-911 £75	Very Good Very Good	Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural, open-backed, dynamic	R	63
Beyer DT 325 £30	Fair Very Good	Lightweight in more ways than one, the 325s may be a little bright for some systems and tastes but will suit duller sources	Supra-aural, open-back, dynamic	R	63
Beyer DT330 Mk II £45	Poor Good	Not the most revealing 'phones encountered, the 330s were nevertheless enjoyable and rarely offended	Circumaural, semi-open, dynamic		55
Beyer DT550 £69	Good Good	On their own the 550s sound articulate with a slightly 'gritty' treble and 'keen' midrange; not suitable for headbangers!	Circumaural, semi-open, dynamic		55
Beyer DT880 £90	Good Good	Well made cans with a warmish sound but fairly solid midrange, though they're not that informative for the price	Circumaural, semi-open, dynamic		63
Beyer DT990 £119	Very Good Very Good	The 990s are definitely a significant pair of dynamic headphones; they have a smooth and yet revealing, neutral sound that is hard to criticise.	Circumaural, open-back, dynamic	R	55
Jecklin Float Model One £79	Very Good Good	Whilst very unusual in appearance the Floats give remarkable sound quality and openness at a reasonable price	Circumaural-ish, open-back, dynamic	BB	55
Jecklin Float Model Two £99	Very Good Good	Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. Note lack of adjustment means you should try before you buy	Circumaural-ish, open-backed, dynamic	R	63
Jecklin Float Electrostatic £399	Excellent Good	One version of the state-of-the-art, these electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural-ish, open-back, electrostatic	R	55
Koss K/6X Plus £30	Poor Fair	'Sixties-style' 'phones from the good ole US of A, their sonic style is unique and can make a system sound quite different	Supra-aural, closed-backed, dynamic		63
Quart Phone 30 £40	Fair Good	Whilst not as seductive as their PMB25 predecessor the 30s are reasonably neutral and do improve on some of the competition – though not stunning	Circumaural, semi-open, dynamic		63
Quart PMB 25II £40	Good Good	Despite a somewhat unconventional suspension system the 25s put in a convincing and enjoyable performance with warm yet lively balance	Circumaural, open-back, dynamic	BB	55
Quart Phone 70 £70	Good Good	Competent performers that were hard to criticise but lacked the life and sparkle of which some of the competition are capable	Circumaural, closed-back, dynamic		63
Quart PMB 65 £70	Good Good	Quite revealing and neutral albeit with the usual closed back sound, this competes well with more established models	Circumaural, closed-back, dynamic	R	55
Quart PMB 85 £90	Very Good Fair	These more expensive Quarts bear a striking resemblance to the Jecklin Float models and use two drivers per ear. Sound is a bit bass heavy but not bad overall	Circumaural, open-backed, dynamic		63
Ross RE-2760 £35	Fair Poor	Stylish white cans from the only British firm in the business. Unfortunately sound quality is not up to par in this price range	Supra-aural, closed-back, dynamic		63
Sennheiser HD30 £13.50	Poor Good	Built specifically for the personal stereo market these small and light Sennheisers have a slightly synthetic sound, but are an upgrade on the average Walkphones	Supra-aural, semi-open back, dynamic		55
Sennheiser HD450 £27	Fair Good	Modern, simple and lightweight phones that are remarkably robust and which turned in a relaxed if weighty performance that was at worst pleasant	Supra-aural, semi-open, dynamic	R	63
Sennheiser HD480 £37	Fair Good	Using the same shell as the 450s, the 480s were a little softened and unrevealing by comparison with their competitors	Supra-aural, semi-open, dynamic		63
Sennheiser HD420SL £47	Good Good	The 420s gave a full and tangible quality to instruments and voices; whilst not the most revealing headphones around they would suit slightly brash sources	Supra-aural, open-back, dynamic		55
Sennheiser HD540 Ref Gold £160	Very Good Good	The 540 Golds prove that dynamic headphones can be subtle, informative and capable of creating a remarkable sense of space	Circumaural, open-back, dynamic	R	55
Sony MDR V3 £30	Good Fair	Portable stereo oriented phones that are very nicely made and combine clarity with a pleasant lack of distortion	Supra-aural, closed-back, dynamic	BB	63

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127

# THE DIRECTORY

## HEADPHONES

NAME PRICE	SOUND COMFORT	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Sony MDR V6 £70	Good Very Good	A lot more civilised and dynamic than the V4s, these were pretty good for their type and fold up to boot	Circumaural, closed-back, dynamic	R	55
Sony MDR V7 £70	Very Good Very Good	Classy sounding cans that are very slick and work well with all types of music, setting the standard in their price range	Circumaural, closed-back, dynamic	R	63
Stax SR34 £140	Very Good Fair	The least expensive Stax headphones around, the SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural, open-back, electret		55
Stax SR84 £210	Very Good Very Good	The stepping stone between dynamics and full electrostatics, these electret phones are revealing, open and highly enjoyable	Supra-aural, open-backed, electret	R	63
Stax Gamma pro/SRD-X pro £296/£230	Excellent Very Good	The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural, open-backed, electrostatic	R	63
Stax SR Gamma £299 (inc. SRD-6 Adaptor at £100)	Very Good Very Good	The next model down the Stax range from the Lambda, the Gamma is an excellent headphone with little to criticise but the price.	Circumaural, open-back, electrostatic	R	55
Stax SR Lambda Pro £545 (inc. SRD-7SB Mk 2 Adaptor at £185)	Excellent Very Good	A bit of an industry reference the Pros are frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural, open-back, electrostatic	R	55

## PERSONAL STEREO

Whilst not exactly hi-fi components, personal stereos probably play more music to more ears than all manner of domestic systems and as such demand some attention. Now that personal CD players have joined the ubiquitous Walkman in the market, the variety and standard of sound quality is huge, with obscurely named cassette players practically falling out of your cornflakes packet and Discmen going for £300.

Despite their diminutive size personals attempt to incorporate as many gimmicks and features as

possible, cassette players often incorporating tuners, graphic equalisers and Dolby noise reduction. CD players are still relatively expensive and don't tend to vary that much on the features front, rather the amount and quality of accessories differs. Most models come with a mains adaptor and some include remote control.

Sound quality on the cassette front seems to have a proportional relationship to price and integrity of construction – wow and flutter being quite obvious on the cheaper models. CD players

become less noisy as they get dearer and also reduce in size; one drawback of the latter seems to be that immunity to shock suffers as a consequence. Cassette players do, on the whole, seem better suited to the outdoor life than their digital counterparts, as does the software. Bear in mind that the sound and lab ratings given below cannot realistically be compared to those in other categories or between cassette and CD personals.

## PERSONAL CASSETTES

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa HS-G35 MkII £30	Poor Fair	A reasonable player for the price but not well suited to classical material and let down by the headphones	Autoreverse, graphic EQ, types I & II		56
Aiwa HS-J36 £89	Good— Average	Comprehensive facilities and reasonable sound are no mean feat for the price.	Dolby, autoreverse, types I, II & IV, AM/FM, recorder	R	56
Aiwa HS-PX101 £149	Average— Good	A very slick little number with soft touch controls and remote control headphones	Dolby B, C, autoreverse, types I, II & IV	R	56
Ferguson 3T46 £35	Very Poor Poor	Not particularly subtle but having reasonable speed constancy, it's OK with most material but can get painful	Autoreverse, AM/FM		56
Philips D6658 £30	Very Poor Poor	The low price limits sound quality, and this is not a spectacular machine, but it does a reasonable job nonetheless	Graphic EQ, AM/FM		56
Saisho PS90R £40	Poor Poor	A bit of a jumble of features and gadgets, the PS90R has on-board speakers, an extending aerial and even records, but sound quality is dubious	Graphic EQ, types I, II & IV, AM/FM, recorder		56
Sanyo MGR-77 £35	Very Poor Very Poor	Rather a basic machine with a raw edgy sound, not helped by poor speed stability	Graphic EQ, AM/FM		56
Sanyo MGR-87 £50	Very Poor Fair	The 87 came up with a slightly fast but rhythmic sound. Although lacking in finesse, it worked OK with pop material	Autoreverse, graphic EQ, AM/FM		56
Sanyo MGP 600D £50	Average+ Average—	With styling aimed at the fairer sex the 600D sounded a little better than the similarly priced MGR-87. Lacking in clarity, it was still quite durable	Dolby, autoreverse, graphic EQ, types I, II & IV		56
Sanyo JJ-P4 £100	Poor Good	Claimed by its makers to be the world's smallest personal stereo the JJ-P4 is a tasty looking object that's capable of good sounds to boot	Dolby, autoreverse, tape types I, II & IV, rechargeable		56
Sony WM-34 £40	Poor Average	This straightforward no frills Walkman makes pretty plausible sounds at a reasonable price and apart from the Walkman Pro was the only model to earn a Best Buy rating	Dolby, types I, II & IV	BB	56
Sony WM-F63 £100	Average— Average—	This attractive Sports Walkman is nicely built but sonically flawed by rather hissy intra-aural headphones	Dolby, autoreverse, types I, II & IV		56
Sony Walkman Pro £249-£289	Good+ Excellent	One of the finest sounding cassette decks on the market today. A mandatory Best Buy, it takes other personals to the cleaners (except on weight and power consumption)	Dolby B, C, types I, II & IV, record, line in/out, varispeed		52/56
Toshiba KT-4027 £35	Very Poor Very Poor	Not a very wonderful machine, the 4027 sounded pretty appalling with all but the most unobtrusive music	Graphic EQ, AM/FM		56
Toshiba KT-4047 £60	Average Average	This model proved capable of making the most of better recordings, and sounds reasonably tuneful	Dolby, autoreverse, graphic EQ, types I, & II, AM/FM	R	56

To Advertise in  
this space ring Cindy Forde  
on 01-631 1433

# HI-FI CARE

245 and 7 Tottenham Court Road London W1P 9AD

01-637 8911

**The Audio Accessory Specialists**

01-637 0371



**TDK**  
DON'T MISS IT. TDK IT.

AUDIO	
D90 5 Pack	£4.66
AR90 3 Pack	£3.76
AR90 5 Pack	£5.99
ARX90 3 Pack	£4.40
ARX90 5 Pack	£7.25
SA90 3 Pack	£4.99
SA90 5 Pack	£7.90
SAX90 3 Pack	£5.95
SAX90 5 Pack	£9.75
MAX90 3 Pack	£9.50
VIDEO	
E180 HS 3 Pack	£8.99
E180 HGX 3 Pack	£11.50

Orders under £25 add £1.50 p&p.  
Over £25 post free.

## BEYER DT 990 'Open' Headphones

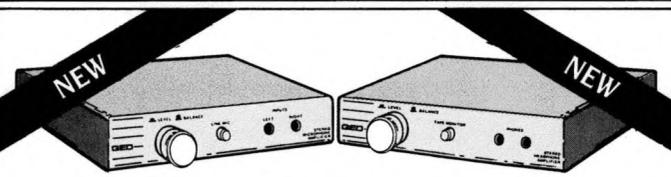
The DT 990 incorporates a very low-mass diaphragm (40% lower weight than the DT 880) and moving coil assembly. The combined mass of the diaphragm and moving coil is only 20% of that found on a typical competitor's headphone. The result is an exceptionally transient response found only in the best electrostatic headphones. The DT 990 offers exceptional sound characteristics along with excellent wearing comfort.

### Specifications

Frequency response: 5-35,000 Hz  
Nominal impedance: 600 ohms/system  
Sound Pressure level at 1kHz: 96 dB  
Maximum Continuous Power: 100 mW 116 dB  
= 7.75 V at 600 ohms  
Weight (without cable): 230 g



**£103**  
inc. p&p



**£39.95**

POWER SUPPLY EXTRA

**£39.95**

POWER SUPPLY EXTRA

The Microphone Pre-Amp adds a stereo microphone input to tape recorders not equipped with such a facility. It features adjustable settings for different microphones.

The Headphone Amp adds two headphone outlets to amplifiers not equipped with such a facility. It connects to the tape outlet socket to avoid any loss of prime system sound quality.

**QED**

LIMITED EDITION

To celebrate Ortofon's 70th anniversary, they have produced a limited edition of only 800 very high quality hand-made MC70 Moving Coil Cartridge. Each one is individually numbered, so take advantage of this unique opportunity.

### Technical Data

Colour: body/shield	White Sapphire
Stylus (diamond shape)	Ortofon Replicant
Stylus Tip Radius	5 x 80 µm
Tracking force range	2.0-2.5 gram
Tracking force (recommended)	2.2 gram
Frequency response	20-50,000 Hz
Frequency response	20-30,000 Hz +5dB/-1dB
Output voltage at 1 kHz (5 cm/sec)	125 µV

ortofon



**£630**  
inc. p&p

## HI-FI CARE

- Helpful and knowledgeable staff
- 4,000 different styli available from stock
- Headphones from £5 to £750
- If in stock, items despatched within 24 hours
- Endless combinations of connecting leads
- Telephone orders & major credit cards accepted
- Shop Hours 9-6 Mon to Sat — callers welcome

245 & 7 Tottenham Court Rd,  
London W1P 9AD

Telephone 01-637 8911  
01-637 0371

(24 hr Line 01-580 4534)

I am interested in  
Credit Card No.  
Name  
Address

Please make cheque payable to:  
Hi Fi Care Ltd, 245 Tottenham Court Rd, London W1P 9AD

## KOSS JCK 200 Infra-Red Headphone



**£134.95**  
inc. p&p

Fed-up with tripping over headphone cables? The Koss JCK 200 offers high performance at a realistic price.

**TRY US FOR HARD TO FIND ITEMS**

# THE DIRECTORY

## 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 OPC-77 £270	Good+ Very Good	Very chunky and well made, the OPC-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 adaptor	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	13.8 x 4 x 17.5cm, 516g, 3" ready, twin hdph sockets		66
Sony 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-40 £200	Fair Good	A 'largish' but attractive player that works well as a Discman being fairly immune to shock and capable of making a good job of reproducing the discs it's given	13.6 x 3.7 x 14.7cm, 480g, mains adaptor, slinky case	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
Toshiba XR-9458 £250	Average+ Good—	Accompanied by a plethora of accessories including a meaty plinth and infra red remote, the Toshiba didn't quite make it on the sound quality front but is worth considering	12.6 x 2.4 x 12.9cm, 460g, 2 remotes, mains adaptor, 3" ready etc		66
Xenon CDP-03 £180	Average— Fair+	A well made and competitively priced machine that is ergonomically spoilt by flat slightly unresponsive buttons. Sound quality ain't too bad but a trifle boring	12.6 x 2.7 x 12.6cm, 560g, high frequency filter, key lock		66

## CD PORTABLES

CD Portables or Yuppie Blasters as we classified them are basically portable stereos gone digital, ie a compact disc player is included alongside the usual AM/FM radio and single or double cassette deck. Compact disc is a novelty that seems to add a fairly hefty premium onto the price of the standard ghetto blaster, but the improved sound quality over standard cassettes may justify this for some.

In virtually every case a CD output socket is

fitted which means that it's possible to play silver discs through a domestic amplifier and loudspeakers, thus they are some sort of substitute for standalone mains machines (as are the personal CD players). One drawback with having a CD player on board is that batteries are gobbled up even quicker than usual, up to ten batteries being required in some cases. Neither are the units particularly light, the heaviest weighing eight kilos!

However they do all run off the mains too, and come with an appropriate lead for this purpose. Other useful features common to most are spare input sockets to record from an external line source such as a preamplified vinyl disc signal, and microphone sockets for recording live events (although the usual lack of record level adjustment is a nuisance).

MODEL PRICE	SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ferguson RCD02 £300	Poor	A large, slightly tinny midi system-esque unit with removable speakers and a slightly brash sounding CD player	Twin cassette, graphic equaliser, spare input (DIN)		53
Fisher PH-D473F £300	Average	The Fisher is quite a neat and compact player which is nice to use but doesn't offer particularly great sound quality	Autoreverse, AFC		53
Hitachi CX-W800 £300	Average+	This meaty Hitachi lives up to Blaster expectations, its super woofer bass speaker giving maximum street credibility	Twin cassette, graphic equaliser, phono input	R	53
Memorex CD-3300 £280	Average	A little bit tacky, the Memorex put in a plausible if unenthalling performance, and will work with external speakers	Spare input		53
Panasonic RX-FD80L £300	Average—	Shiny in a glitzy way, this Panasonic features a reasonable cassette deck but a below par CD player with tiny transport controls	Autoreverse, spare input		53
Sharp WQ-CD15 £250	Good	A reasonably compact machine with a quite impressive CD player and a novel twin cassette mechanism	Twin cassette, graphic equaliser, spare input	R	53
Sony CFD-66L £350	Good	A very attractive player in the true yuppie mould of white plastic with silver details, it even sounds OK	Spare input, shuffle play, AMS (tape search system)	R	53
Toshiba RT-7096 £250	Poor	Quite a large box for the money, the Toshiba isn't too special when it comes to sound quality but does have partly wooden detachable speakers	Twin cassette, graphic equaliser, spare input		53

## 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 floor 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 A820 £40	4 leg Fair	A light open-framed budget design slightly lacking in rigidity and subjectively superceded by other stands costing £10 more.	19 x 19cm 53cm		58
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

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 127

# THE SWEETEST SOUNDS ARE JUST OFF THE M25



ALPHASON SONATA  
"THE No. 1 TURNTABLE"



TOWNSHEND  
"THE ROCK"  
TURNTABLE



MUSICAL FIDELITY  
& MVT PRE-AMP  
P270 POWER AMP



NAKAMICHI CR5E  
CASSETTE DECK



INFINITY  
8 KAPPA  
LOUDSPEAKERS



MORDAUNT-SHORT  
SYSTEM 442  
LOUDSPEAKERS



LUXMAN KD117  
DAT PLAYER  
*In stock NOW!*



CAMBRIDGE AUDIO CD2  
COMPACT DISC PLAYER



MARANTZ CD94/CD94  
COMPACT DISC PLAYER &  
D/A CONVERTER



QUAD FM4  
TUNER  
34 PRE-AMP  
306 POWER AMP



SPENDOR SPI  
LOUDSPEAKERS



TOWNSHEND  
GLASTONBURY II  
LOUDSPEAKERS

IN STOCK — OVER 300 SEPARATES PLUS ACCESSORIES



MANTICORE MANTRA



KENWOOD  
DP-1100SG Remote Controlled  
CD Player with Optical Output



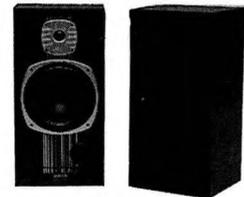
HARMAN KARDON



DENON DR-M44HX  
CASSETTE DECK



B & W MATRIX 1



TANNOY M20 GOLD

Shop & Home demonstrations given

ADC, AKG, Alphason, AR, Ariston, Audio Technica, Avance, B&W, Beyer, British Loudspeakers (BLQ), Bose, Cambridge Audio, Castle, Cemac, Chord, Citation, Decca, Denon, DNM, Dual, Foundation, Gale, Glanz, Goldring, Goodmans, Grado, Harman/Kardon, Hunt, Infinity, JBL, Jecklin, Kenwood, Kiseki, Koss, Logic, Luxman, Manticore, Marantz, MDM, Milltek, Mordaunt-Short, Musical Fidelity, NAD, Nagaoka, Nakamichi, Onkyo, Ortofon, Philips (CD), Proton, QED, Quad, Rata, Revolver, Rotel, Ruark, Sansui, Sennheiser, Shure, Spendor, Tannoy, Target, Thorens, Torlyte, Townshend 'The Rock' turntable & Glastonbury II loudspeakers, Trio, Van den Hul, Vecteur, Wharfedale, Yamaha, etc.

## NOT ONLY HI-FI IN BRENTWOOD

### BUT ALSO COMPACT DISCS, RECORDS & CASSETTES

"THOUSANDS OF CDs — THOUSANDS OF RECORDS — THOUSANDS OF CASSETTES"

★★★ IN STOCK ★★★

Most importantly we offer: **FIRST-CLASS PRODUCT CHOICE**  
**ATTRACTIVE PRICES**  
**FRIENDLY, HELPFUL SERVICE**

We stock all types of music and spoken word, but concentrate mainly on classical music. Not only will you find a choice of performance on mainstream repertoire but also you will discover recordings of many lesser-known works. We have musically knowledgeable staff to help you as well as the *Penguin Record Guides*, back issues of *Gramophone*, catalogues, etc., for reference in the shop.

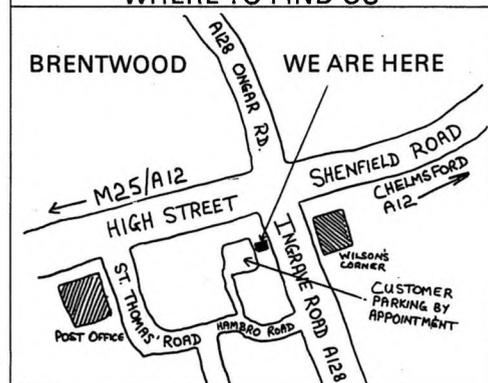
All products are keenly priced (including our vast back catalogue!) with many bargains and sale items at all times. There is also a voucher scheme.

#### HAVE YOU HEARD ABOUT OUR VOUCHER SCHEME?

You will receive one voucher for every £10 spent at our normal selling price (but every £5 in respect of CDs, records & cassettes). 12 vouchers collected will entitle you to one compact disc from stock at HALF PRICE (6 vouchers for a record or cassette).

WHAT MORE COULD YOU WANT?  
So we look forward to seeing you soon?

#### WHERE TO FIND US



# BRENTWOOD MUSIC & HI-FI CENTRE

Ground &  
First Floor

2 INGRAVE ROAD, BRENTWOOD, ESSEX

Tel: (0277)  
22120

Corner of Brentwood High Street and Ingrave Road (A128)

On-site customer parking by appointment.

Easy to reach — 5 mins. from M25.

# THE DIRECTORY

## LOUDSPEAKER STANDS

MODEL PRICE	TYPE FINISH	COMMENTS	TOP PLATE SIZE HEIGHT	VALUE	BACK ISSUE FULL REVIEW
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 speaker's own 'sound' to remain intact.	23 x 21cm 47cm	R	58
Linn Kan II £74	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 £80	4 leg Very Good	The Sara exhibits some odd properties so its use other than with the Sara loudspeaker should be viewed with caution.	25 x 21cm 53cm		58
Monotrak Engineering M1 £58	1 leg Good	The M1 gave the mid and treble a commendably smooth and detailed presentation but bass sounded rather lacklustre and muddy.	19 x 18.5cm 48cm		58
Monotrak Engineering M4 £58	4 leg Very Good	Begging comparison with Heybrook's HBS1 the M4 maintained much of the openness and forthright detail of that model.	23 x 21.5cm 53cm	R	58
Monotrak Engineering M4S £58	4 leg Very Good	Its stature and stability would seem to mark it out as most suitable for smaller, lighter cabinets. The M4S possessed an open midband and clear treble.	20 x 17.5cm 53cm		58
Mordaunt-Short IS1 II £45	3 leg Good	Suited to low mass speakers, preferably using spikes to effect coupling, they sounded slightly 'jazzed up' but the overall sound was quite unmiddled.	18 x 15cm 56cm	R	58
Origin Live £117	3 leg Good	An unusual tripod stand devoid of top plate and taking up more floor space than normal, subjective and technical performance was exemplary.	(support area) 22 x 17.5cm 52cm	R	58
Partington PP4 £50	1 leg Good	The PP4 offers a rather mixed performance, though when damped with sand infill it was less ready to embellish the overall sound and low frequencies became tauter and quicker.	18 x 16.5cm 48cm		58
Partington Dreadnought II £120 (filled)	1 leg Very Good	Ideal for systems on the light/bright side of neutral, the Dreadnought IIs nevertheless still need some careful re-examination by Partington.	17.5 x 16.5cm 63cm		58
QED TS22 Tristand £50	3 leg Very Good	Most tracks sounded uplifted or buoyant, never thick nor coloured. It worked well with most of the speakers: tried and encouraged a fluid and revealing midband.	19 x 17cm 45/50/58cm	BB	58
RATA Torlyte £190	2 panel Excellent	Suited to low mass speakers, these unusual stands are hardly discreet but offer transparent and clean sound – much like the Torlyte table!	25 x 21cm 48cm	R	58
Target HS20 £53	1 leg Excellent	This monopod stand can be used either filled or unfilled and encourages different characteristics in the sound accordingly.	19 x 16.5cm 53cm		58
Target HJ15/3 £83	3 leg Very Good	Sound quality was basically very good though without the sand infill some loudspeakers may sound a little unbalanced as both bass and treble regions are subjectively exaggerated.	28 x 28cm 40cm	R	58

## EQUIPMENT SUPPORTS

MODEL PRICE	TYPE FINISH	COMMENTS	SIZE (H x W x D)	VALUE	BACK ISSUE FULL REVIEW
Audioquest Sorbothane Feet £10 each	Feet Good	These large gumdrops are very useful for damping vibrations in amplifiers and especially CD players.	6.5 x 2.5cm (circular)	R	57
Cornflake TCSS £50	Table Very Good	A little too close to the ground for comfort, perhaps, but this novel and stylish little table is certainly worth seeking out.	29 x 43 x 33cm	R	57
Cornflake TCS6 £50	Shelf Good	A squat and rigid frame supports a Medite top board with four adjustable spikes, better suited to suspended sub-chassis turntables.	43 x 23 x 33cm		57
Deltec Isolation Base £135	Platform Good	Designed for all CD players, amplifiers and separates, but not suspended sub-chassis turntables, the isolation is second to none.	50.5 x 40cm	R	57
RATA Model A £125	Table Very Good	A three-legged Torlyte turntable support that has become something of an industry reference.	46 x 46.5 x 38.5cm	R	57
RATA Amplat £40.25	Platform Very Good	A lightweight and rigid Torlyte slat with spikes for floor or shelf mounting, it works well in conjunction with the Target TT2.	4 x 44.5 x 35cm		57
Sound Organisation Table £55	Table Very Good	A deceptively simple structure that just happens to be engineered in a thoughtful, and ultimately successful manner.	37 x 45 x 35cm	BB	57
Sound Organisation Wall Stand £40	Shelf Very Good	The first of its ilk and still amongst the best, this simple framework represents a vast improvement over standard furniture shelves.	27.5 x 43 x 35cm	BB	57
Target TT1 £46.50	Shelf Excellent	This rigidly braced shelf offers both good sound quality and material value for money.	26 x 46.5 x 35.5cm	BB	57
Target TT2 £47.50	Table Very Good	Standing up to the best in most areas, the TT2's only real foible concerns a slight loss of bass 'slam'.	52 x 46.5 x 35.5cm	BB	57
Townshend Suspension Base £145	Platform Fair	Designed to complement the Rock turntable, this platform will bring subjective improvement to a wide range of electronics.	43 x 36cm	R	57

## CABLES AND CONNECTIONS

Although cables and connections are sometimes thought to be the least important items in an audio system there has been a growing awareness in recent years that they have a significant effect on sound quality. To this end there is now a vast array of exotic cables and interconnects available to those interested in experimentation. The key observation on cables is that they are much more than mere accessories. Carrying the audio signal, just as any amplifier does, it's really not too surprising that they can influence the quality of that

signal.

The characteristics of any cable are determined by the materials and topologies utilised in its construction. The purity of the conductor, nature of the insulator dielectric, mechanical construction, physical geometry, RF characteristics, efficiency of screening and finally the connectors themselves, all play vital roles in the sonic character. These factors tend to vary more with interconnect cables which are used to carry the signal between active components like pre and power amplifiers. The

interconnects summarised here were tested in 1m terminated lengths and therefore the results and prices relate to that length – some cables may well perform differently when used in longer lengths.

The features column contains information on the material make-up of the different cables with the following abbreviations: OFC – oxygen free copper, OFHC – oxygen free high conductivity (Audionote define the HC as high crystal), PC-OCC – pure copper by ohno continuous casting, LC-OFC – linear crystal oxygen free copper.

## INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Apature LSD N/A in UK	Poor Fair	Faint resonant boom was audible at very low frequencies, but otherwise this cable sounded remarkably neutral.	Silver plated copper, PTFE dielectric		59
Audioquest Reference 2 £29	Good Fair	Ultimately Reference 2 simply damped much of the atmosphere and emotional charge of a musical performance.	OF copper		59
Audioquest Livewire Topaz £29	Good Fair	Sounding 'bigger' and faintly richer than Reference 2, Topaz was also slightly grainy at the top end.	Gold-plated plugs, OFHC copper		59
Audioquest Livewire Ruby £45	Fair Good	Smoother sounding than the Topaz, the extended crystal Ruby is less grainy and coarse, better able to resolve complex passages.	FCL copper twin axial	R	59

## THE DIRECTORY

## INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Audioquest Livewire Quartz £65	Good Good	Quartz has an ideal, neutral balance that embodies sparkling clarity without the drawbacks of harshness or compression.	3 piece plugs, PTFE dielectric	R	59
Audio Technica AT6115 £50	Very Good Fair	This cable sounds somewhat 'quieter' than the original LC-OFC interconnect, but is also less transparent and three dimensional.	PC-OCC copper coaxial		59
Audionote Copper ANC £35	Fair Good	ANC sounded punchy with a faintly lean but tightly-focused bass character. This crystalline precision waned slightly at higher frequencies.	OFHC copper twin-axial	R	59
Audionote Flexible Silver ANS £85	Fair Good	ANS scored a hit with its transparent midband and revealing but quite unforced treble quality. Bass transients were slightly softened.	Silver signal & Copper screen	R	59
Audionote Silver ANV £140	Poor Fair	Far weightier-sounding than the flexible ANS, ANV interconnect also possesses a fair degree of treble clarity and sparkle.	21 strand silver Litz		59
Aural Symphonics N/A in UK	Poor Good	This cable enjoyed an open and transparent midband and sounded remarkably neutral and faithful to the source.	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 £4.60 per m.)	Single strand nickel-plated copper. Unshielded	R	59
Kimber Kable PSB £32	Very Good Very Good	An exceedingly transparent midband but slightly 'clanky' treble. It always managed to sound remarkably uncluttered and open.	OFC, PTFE dielectric	BB	59
Kimber Kable KC-1 £47	Very Good Fair	Tonally faintly leaner and brighter than the more open-weave PSB, KC-1's treble detail was just too sharp and grainy.	Multi-gauge PTFE dielectric		59
Kimber Kable KC-AG £375	Good Very Good	Treble detail resolution was perceived in a slightly abrupt if wholly controlled fashion. Depth re-creation and lateral separation were excellent.	Multi-gauge silver, PTFE dielectric	R	59
MDM Interconnect £14.95	Good Fair	The subjective performance of MDM did appear a little imprecise at the frequency extremes, but a worthwhile upgrade on budget interconnect.	Coaxial, solid core, gold plated plugs		59
MIT PC-Squared £75	Fair Good	This multi-gauge cable produced a very open and buoyant midband but sounded slightly 'peculiar' at frequency extremes.	OFC, multi-gauge	R	59
MIT Spectral MI330 £193	Poor Fair	MI330 displays a marvellously open and enticing midband quality, bass is warm and rich but this character has a tendency to dominate.	Multi-gauge balanced bandwidth		59
Monitor PC 0100381 £17	Good Fair	There is more than a hint of instrumental mudding and bass is slightly soft, however, the slightly 'shut-in' sound is par for the course at the price.	OFC, coaxial	R	59
Monster Interlink 400 £30	Good Good	Bass is solid and punchy, counterpointed by a slightly overblown midband which tends to make vocalists sound larger-than-life.	Multi-gauge	R	59
Monster Interlink 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 dry.	Silver plated 'matched copper'		59
Van den Hul MC-Gold £247	Fair Good	It possesses a rich and beguiling treble balance that matches a weighty, slightly warm bass character. Seductive balance may prove worthwhile in some circumstances.	Silver & gold plated copper		59
Van den Hul MC-Silver £747	Good Good	Although remarkably transparent for an asymmetric design this costly cable was not considered to be of 'state-of-the-art' standard, and is bettered by cheaper models.	19 silver plated copper strands		59
Vecteur 8045 £49	Very Good Good	Sounding solid and forthright it might seem slightly cold in some systems but the treble 'edge' is mercifully clean. Very low frequencies were a little lacking in 'slam'.	LC-OFC signal & screen	R	59

To Advertise in  
this space ring Cindy Forde  
on 01-631 1433

# THE DIRECTORY

## LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>Absolute Wire Force 4</b> £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
<b>Audionote OR-200</b> £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
<b>Audionote AN-SP</b> £100 per metre	Average— Good	A clean and open sounding cable that offered a deep and pleasantly detailed perspective. Bass was slightly restricted, but seemed tight and coherent nonetheless	15 silver strands, polyethylene dielectric		64
<b>Audioquest BC-4</b> £2 per metre	Average+ Good+	There was a slowing of fast transient edges to contend with but in general BC-4 offered a delightful clarity and sparkle throughout the highest octaves	4 OFHC strands, PVC dielectric	BB	64
<b>Audioquest Livewire Black</b> £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
<b>Audioquest Livewire Green</b> £30 per metre	Good Fair+	Green proved more overtly dynamic and forward than BC-4 with simple music, but complex passages tended towards a mushy and ill-defined perspective. FCL – functionally crystal less	FCL, surface only – foam core construction		64
<b>Audio Technica AT6120</b> £95 – 10m	Fair+ Fair	Compared to earlier LC-OFC cables this PC-OCC derivative sounded smoother and less aggressive	PC-OCC, PVC dielectric		64
<b>Bellwire</b> 12µ 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
<b>Deltec 8S</b> £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
<b>Deltec Black Sixteen</b> £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
<b>DNM Solid core</b> £2.30 per metre	Average Fair	DNM cable seems too unbalanced for general consumption but excellent results have been obtained in sympathetic systems	0.54mm single strand, webbed PVC dielectric	R	64
<b>Exposure</b> £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
<b>Kimber Kable 4PR</b> £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
<b>Kimber Kable 4TC</b> £16 per metre	Good Good+	4TC made a great impression in the listening tests with an open midband, a smooth and unflagging treble with slightly rich but suitably weighty bass	OF copper, PTFE dielectric	R	64
<b>Linn K20</b> £2 per metre	Good Fair	Subjectively it erred on the forward and bright side of neutral but enjoyed an essentially clear and punchy delivery	56 OFC strands, webbed PVC dielectric		64
<b>Marantz ML-55S</b> £24.90 – 10m	Fair Fair	Subjectively this cable offered a loose and splashy treble which, though not overtly bright, did compromise both tonal and timbral accuracy	30 OFC strands, 3 conductors PVC dielectric		64
<b>Mission Cyrus</b> £2.50 per metre	Average+ Good	Because of its impedance characteristic this cable will deliver a smooth and unflagging treble balance with loudspeakers offering an easy load	0.8mm single strand, PVC dielectric	BB	64
<b>Monitor PC Silverline PC4</b> £5.75 per metre	Good Average	Sonically it laboured under a heavy and claustrophobic balance, lacking the see through transparency and lucidity of the better solid core cables	2072 x 0.07mm silver plated copper strands		64
<b>Monster Superflex</b> £2.50 per metre	Fair+ Fair+	Treble detail was both reserved and confused though there was little in the way of harshness and grain. Deep bass notes were also found to be lacking	OFC, multistrand, Duraflex dielectric		64
<b>Monster Original</b> £4 per metre	Good Fair+	Original sounded relatively congested and murky at higher frequencies but possessed weight and conviction in the bass	Multistrand		64
<b>Monster Powerline 2</b> £12 per metre	Good Good—	Powerline stamped its own hallmark on the sound with a strong taut bass and an essentially clear midband giving tactile stereo images	Multistrand, helical construction		64
<b>Musical Fidelity Lifeline</b> £11.50 per metre	Fair Good—	Lifeline did demonstrate a strong directional inclination, affording a laid back but fairly neutral balance when correctly oriented	4 x 0.8mm PC-OCC strands	R	64
<b>Naim NAC-A4</b> £2.25 per metre	Good Fair+	Tinged with brightness while the deep bass response seemed both over heavy and poorly integrated compared to the immediate competition	Multistrand, webbed PVC dielectric		64
<b>NVA</b> £6 per metre	Average+ Good	A light and breezy sounding cable best suited to short lengths, NVA benefitted from a clear and transparent outlook	7 x 0.25mm silver alloy strands, PTFE	R	64
<b>Origin Live Soli-Core Ordinary</b> £1.80 per metre	Good Fair+	Subjectively it bettered the performance of the costlier Super version, affording a pleasantly detailed and spacious soundstage with firm bass but slightly coarse treble	1.8mm and 0.5mm single strands	R	64
<b>QED 79-Strand</b> 90µ per metre	Good Fair	For much of the last decade QED 79-Strand has been the first port of call for enthusiasts on the upgrading ladder, a tradition that should still hold true today	79 strand, PVC dielectric	R	64
<b>QED Incon Graphite</b> £1.75 per metre	Fair+ Fair+	This graphite version of Incon sounded cruder and generally more heavy handed than the cheaper unshielded type. Overall presentation was mildly restricted and cloaked in a faint aural fog	OFHC, polymeric screen		64
<b>QED Flat 200</b> £1.95 per metre	Good Good	I detected a degree of confusion at low frequencies but this did not stifle the acoustic atmosphere which remained open and positive	200 strands, flat webbed PVC dielectric	R	64
<b>Rotel Supra 4</b> £2.49 per metre	Good+ Good	Ideal for both long and short runs, it furnishes a big sound that benefits further from a smooth, unflagging treble	1,036 OFC strands, webbed PVC dielectric	R	64
<b>Rotel Supra 10</b> £6.49 per metre	Good+ Good	Supra 10 provided a very free and open sound that was unhindered by any excess at low frequencies. Worth its weight in scrap copper!	2,562 OFC strands, webbed PVC dielectric	R	64
<b>Sony RK-S5ES</b> £59.95 – 5m	Fair+ Fair+	The sound of this cable was also somewhat controlled and over damped. The treble was relatively free and airy but lower octaves, including the midband, were constrained	350 x 0.08mm OFC strands, heat shrink dielectric		64
<b>Solid core mains cable</b> 36µ per metre	Fair+ Good	It enjoys much of the smooth treble and articulate midrange usually associated with the better solid core derivatives. Lean but taut and rhythmically coherent	1.5mm square, 3 cores, PVC dielectric	BB	64
<b>Sterling</b> £499 – 5m pair	Fair Fair	This pre-production sample possessed a strangely muddled and reserved sound quality. It suffered from a progressive instrument modulation that totally confused more complex orchestral passages	Pure Silver, PTFE dielectric		64
<b>Townshend Isolda</b> £400 – 5m pair	Fair+ Good	Isolda possessed a truly dark background out of which rose a very solid and extended bass together with an excellent sense of transparency through the upper octaves	8 coax cables per conductor – very thick	R	64
<b>van den Hul CS-122</b> £5.50 per metre	Fair+ Good—	Characterised by a driving and powerful bass, CS-122 proved to be a heavy sounding cable. Mid treble detail was refreshingly clear but there was a slightly muted air about the extreme treble	19 x 0.45mm silver plated strands, webbed rubberised dielectric	R	64
<b>van den Hul CS-352</b> £12.95 per metre	Good Fair+	Subjectively it sounded like CS-122 only more so, the deep rumbling bass tending to overwhelm subtle musical details. It also appeared a trifle peaky in the treble	7 x 0.76mm + 168 x 0.125mm silver plated strands, rubberised dielectric		64
<b>van den Hul SCS-12</b> £29.95 per linear metre	Good+ Good+	SCS-12 set a high standard with a tight and well focused soundstage populated with tactile stereo images. Bass wasn't as extended or resolved as some other cables	19 silver plated strands of 12 different gauges, PTFE dielectric	R	64

# THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

LOUDSPEAKER CABLES

HI-FI CHOICE

# Audio Projects

WHEN ONLY THE BEST WILL DO...



## LINN EKOS TONEARM

WE STOCK A RANGE OF SELECTED COMPONENTS FROM:

A&R (CAMBRIDGE). AUDIOLAB. CREEK. DENON. EPOS. EXPOSURE. HEYBROOK. INCA TECH. KEF. LINN PRODUCTS. MUSICAL FIDELITY. NAIM AUDIO. QUAD. REGA. ROGERS. ROYD. TANNOY.

Home trials our speciality.  
Open 9.30 - 6.00 Tues - Friday. 11.00 - 5.30 Saturday

45 Headingley Lane. Leeds. LS6 1 DP. Tel (0532) 304565

# Pinewood Music

Sweeten your  
s stem  
with a  
**WELL TEMPERED**  
turntable and  
tonearm

*The Pinewood Music Company*

'Martins', Church Lane, Goodworth Clatford,

Andover, Hampshire SP11 7HL

Telephone: Andover (0264) 57536

*Pinewood always has the best*

## ADVERTISERS INDEX

ABSOLUTE SOUND	IFC	HI FI EXPERIENCE	116	ROKSAN	20
ACOUSTIC ENGINEERING	102	HITACHI	93	ROTEL UK	68
ADC SOUNDTEK	58	INCATECH	130	RUARK	IBC
ALPHASON	100	ION SYSTEMS	86 & 90	SALISBURY HI FI	100
ARJAY INTERIORS	126	NHIFI	90	SD ACOUSTICS	54
AT LABS	62, 63	JEFFRIES HI FI	108	SELECTIVE AUDIO	27
AUDIO EXCELLENCE	96	KJ LEISURESOUND	72	SEVENOAKS HI FI	78, 79
AUDIO FILE	110	LEICESTER HI FI CO.	38	SME	14
AUDIO PROJECTS	142	LINN	22, 23, 24	SONY	12, 13, 15
AUDIO SOUTH	110	LOCKTON SHOPS	42, 43	SOUNDS EXCLUSIVE	50
AUDIO TECHNICA	33, 104	MEMTEC PRODUCTS	1	SOUND ROOM OF NORBURY	118
AUDIO VENUE	102	MOORGATE ACOUSTICS	112	SOURCE	82
AYLESBURY HI FI	110	MUSICAL APPROACH	142	SHROPSHIRE HI FI	38
BILL HUTCHINSON	150	O'BRIEN HI FI	50	SPALDINGS	118
BRADY WA	98	PHONOGRAPH	93	SUSSEX AUDIO	38
B & W NAKAMICHI	OBC	PHOTOCRAFT	88	TEAC	10
BOXSHALL, ST VE	27, 82	PINEWOOD	142	UXBRIDGE AUDIO	136
CHEW & OSBOURNE	54	PROGRESSIVE AUDIO	112	VICTORIA HI FI	86
CHICHESTER HI FI	27	QUEEN'S HI FI	38	VOYD	50
COVENT GARDEN RECORDS	76	RADLETT AUDIO	108	WEST MIDLANDS AUDIO	80
DNM DESIGN	56	RAYLEIGH HI FI	106	WESTWOOD AND MASON	122
FRANK HARVEY	114	READING HI FI	48	WILMSLOW AUDIO	142
HAMPSHIRE AUDIO	140	RICHER SOUNDS	4 & 5	YAMAHA	6
HAYDEN LABS	32 & 34	ROGERS SWISSTONE	127	ZEUS AUDIO	27

# THE DIRECTORY

## LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
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-0FC PTFE insulated strands	BB	64
Vecteur S-CV90 £199 - 5m pair	Fair+ Fair+	It seemed both less transparent and integrated throughout the midband than R-CV30, though both frequency extremes were spruced up with a tighter sharper delivery	6 x 0.7mm LC-0FC strands		64

## IN-CAR ENTERTAINMENT

In-car entertainment is an area not usually associated with the esoteric world of domestic hi-fi. However, it represents a source of musical entertainment that many of us are exposed to every day. The majority of new cars are fitted with some form of radio before they leave the showroom and in many cases this usually very basic player is taken for granted and accepted as representative of in-car audio standards.

For the price of a budget amplifier there is a wide variety of in-car machines to choose from, some of

them offering practically every gadget or feature under the sun. The majority of sub-£300 players are integrated units featuring a cassette player, AM/FM tuner and amplifier, all in one remarkably compact standard sized box. At this price level the cassette players tend to be fairly basic affairs, although autoreverse and noise reduction systems are both fairly common. Tuners are usually of the digital variety with varying degrees of sophistication in signal tuning and presetting, with some machines featuring as many as 18 FM presets. The emphasis

is on the frequency modulated band and AM often suffers as a consequence, but fortunately for radio enthusiasts there are some exceptions.

The amplifier is usually designed to drive two pairs of speakers mounted fore and aft of the vehicle, and a fader is fitted to adjust the balance between the two. The dearer machines feature separate bass and treble controls which can be quite handy given the unusual acoustic of the car environment and the variety in balance and presentation to be had from car speakers.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Alpine 7282L £250	Good Very Good	A very attractive and seductive sounding player. The matt surfaced transparent preset keys are especially sexy	Bass/treble controls, 12 FM 6 AM presets, chrome eq., clock, 8W	R	61
Aiwa CT-Z3500YL £199	Fair Fair	A nicely designed machine with a flip up lid for disguise purposes. Sound quality from cassette is a bit poor but the radio is exemplary especially on AM	Bass/Treble controls, 6 FM, 12 AM presets, Dolby, chrome eq., 8.4W	R	62
Blaupunkt Paris SQM 48 £253	Average Average	A powerful and sensibly designed player but let down by a very dull sounding cassette. The radio is a bit better	Bass/treble controls, 5 FM, 10 AM presets, uni-directional, 11.5W		62
Blaupunkt Windsor SQR 38 £275	Good Average	Not very enthralling sonically, the Windsor is rather low powered but does have a reasonably stable tape transport	5 FM, 10 AM presets, 3.1W		62
Clarion 916HP £160	Good Average	With its rubbery buttons and touches of white this is a modest looking player let down by a weak cassette	Bass/treble controls, 5 FM, 5 AM presets, 9W		61
Clarion 946HP £250	Very Good Very Good	A good FM side let down slightly by AM performance. This Clarion is particularly nice to use with its nifty SAM tuning system	Bass/treble controls, 12 FM/6 AM presets, slot-in, 15.1W	R	61
Goodmans GCE229 £150	Fair Average	If knobs, switches and legends are your bag then the GCE229 is the one for you - a lot of gizmos for the price and it even sounds OK	Bass/treble controls, 6 FM/6 AM presets, Chrome eq., clock, MSS, 10.1W	BB	61
Hitachi CSK-402E £250	Good Good	An attractively designed little player that for once doesn't disappoint when it comes to playing music, and it even has a security system	Bass/treble controls, 6 FM, 12 AM presets, Dolby, chrome eq., music search, 7.4W	R	62
JVC RX-318 £200	Average Average	This JVC sounded quite enjoyable and turned in an impressive performance on FM. It even looks quite nice	Bass/treble controls, 5 FM, 10 AM presets, slot-in, 8.8W	R	62
JVC RX-418 £250	Average Fair	An attractively designed machine with a fair selection of features - even an aux socket for a portable CD player	Bass/treble controls, 10 FM, 10 AM presets, Dolby, chrome eq., slot-in, aux socket, 7.7W		62
Nakamichi TD-400E/PA-300 II £450/£275	Very Good Excellent	If you want your in-car entertainment to compete on sound quality grounds with your domestic system, this combo offers a very strong challenge	Bass/treble controls, 5 FM, 10 AM presets, uni-directional, chrome eq., Dolby B, C, 75W	R	62
Panasonic CQ-497 £117	Fair Poor	The CQ-497 has a traditional style analogue tuning system making it easy to use. AM reception was good but the other sources are less encouraging	Bass/treble controls, chrome, NR, 7W		62
Philips 553 £120	Average Average	Not the most ergonomic player on test but sound quality was quite refined for the price. Presets are a bit gauche	4 FM, 4 AM presets uni-directional cassette 3.1W		61
Philips DC680 £180	Average Good	A colourful and musically competent player that despite a gammy volume knob is well worth checking out.	8 FM, 4 AM presets 3.5W	R	61
Pioneer KE-3030 £150	Poor Fair	A tasty looking, if sonically bass heavy, little box well suited to blasting out rock or dub	18 FM, 6 AM presets 4.2W		61
Pioneer KEH-5080B £230	Fair Good	A chunky and neatly styled player with healthy power output and an easy relaxed sound. Just the thing for pumping up the volume	Bass/treble controls, 18 FM, 6 AM presets, anti-theft device, slot-in, 9W	R	61
Sansui RX-3100L £180	Poor Fair	Quite flash looking with a reasonable feature count but FM sound and cassette replay quality could be a bit stinger at the price	Bass/treble controls, 12 FM, 12 AM presets, chrome eq., 8W		61
Sansui RX-5100L £250	Good Very Good	One of the cleaner machines around the 5100 has an excellent AM section and a reasonable cassette player	Bass/treble controls, 12 FM, 6 AM presets, chrome eq., slot-in, 12.5W	R	61
Sharp RG-F816E £200	Poor Average	Nothing if not novel the 816, with its unusual anti-theft system is custom built for the furry dice brigade but is sonically a bit lacklustre	Four band graphic, 8 FM, 16 AM presets, ASP, Dolby, MSS, 10.9W		62
Sharp RG-F882E £220	Average Average	Again a glitzy full feature machine with a flip out control panel and plenty of lights. However, sound quality is a bit disappointing	Seven band graphic, 5 FM, 10 AM presets, ASP, chrome eq., Dolby, 8.5W		62

To Advertise in  
this space ring Cindy Forde  
on 01-631 1433



# 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<sup>-6</sup> 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 $\mu$ s or 120 $\mu$ 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 interconnected 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-( $\mu$ ):** Prefix for units meaning one millionth of.

**MICROSECONDS ( $\mu$ 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

*Paul Messenger gets on his soapbox to view the future world of radio broadcasting.*

Delegated to examine the recent government White Paper on the topic of broadcasting, and its likely influence upon UK hi-fi life, I find myself wondering whether it really amounts to much more than a political fart that may have only limited practical impact. Its importance lies in addressing the issues that are raised by advances in RF (radio frequency) technology, which is one stage better than burying the governmental head firmly beneath the sand. But as one has come to expect from the current administration, 'deregulation' is doublespeak for a regulatory framework that looks quite likely to reduce the overall range of choice even while offering a greater number of options. And, inevitably, control will remain centralised.

From the hi-fi viewpoint, radio is arguably more important than television. But it looks as though even the most die-hard enthusiast will be forced to come to terms with the coming audio/video revolution – in much the same way that digital audio has been foisted on willing and unwilling alike.

Radio is given pretty short shrift in the White Paper, dismissed in two out of 45 pages. But to be fair this is partly because the issue was discussed very thoroughly in the Green Paper of February 1987, and the White Paper merely sets out confirmation of most of those discussion proposals.

The prospects of three new national commercial radio services might sound quite promising. But the term 'commercial' effectively guarantees lowest common denominator programming along the same lines as Radios 1 and 2. And only one of these networks is likely to offer reasonable standards of quality through FM transmission.

Fundamental to the changes envisaged for the national network is an end to 'simulcasting' of the type that

puts the same programmes on FM and AM bands, since this is – quite rightly – regarded as a waste of scarce spectrum. But this does mean that some programmes will now only be available on AM, with all the quality compromises involved. (A corollary is that this could stimulate the development of some serious high quality AM tuners, though I wouldn't bet on it – a practical upper bandwidth limitation of around 8kHz is a powerful disincentive.)

Potentially more interesting than any new national networks are the opportunities for local and community type radio services. Such services are already available through pirate operations in the larger cities, and clearly fulfil an important demand. Pirates' equipment is liable to regular confiscation, and is therefore invariably of very dubious quality. Legalisation could at least remove the throwaway factor in the equipment currently used and make investment in better quality gear worthwhile.

Obviously no community radio station is going to match the technical resources or sophistication of a national network, let alone the BBC. But this may not necessarily be such a bad thing. By their very nature, community radio stations will have an essential simplicity, operating often from a single site and with inherently short signal paths. Which as any hi-fi enthusiast will confirm provides a head start in avoiding musical degradation.

It certainly appears that community radio could prove to be the one factor which actually expands the range of choice available from broadcasting, simply because the comparatively small scale of such an operation is ideally suited to programming which will appeal to particular minorities, though it's impossible to predict in advance how the UK version will develop.

Our radio specialist Norman McLeod commented that one of the more surprising consequences of Australian liberalisation was the springing up of a number of stations playing exclusively classical music, and filling a hitherto unsatisfied demand.

Having had twenty or more years to mature, the US situation shows how AM and FM broadcasting has each achieved its own identity when allowed to operate separately, the whole offering a breadth of minority appeal that is almost inconceivable to one raised on Radios 1/2/3/4. (A marginally relevant side issue is that radio listeners rarely channel hop; most find the particular station that best suits their lifestyle and preferences, and keep it on like a comfortable cardigan.)

The UK will throw up its own special problems. To start with, there are already open threats that anyone convicted of 'pirate' operations will be ineligible for a community franchise. Which is just further evidence that the government still places the rule of authoritarianism as a higher priority than market forces and the evolving status quo – and thereby risks losing the community aspect of community radio.

## NEEDLE TIME

Another potentially knotty UK problem may well revolve around needle time agreements, given the (mostly) cosy relationship that has evolved over decades between the musicians union and the BBC. There's bound to be a fair amount of wailing and teeth gnashing before the reality that record sales are directly proportional to airplay, and that both are in the interest of musicians as a whole takes over. The prospects of a further extension of today's interminable phone-ins and spurious competitions (desperately filling up 'non-needle' airtime) are too horrible to contemplate – though

come to think of it, I might enjoy them better if they droned on in Welsh, or Greek, or perhaps even Chinese.

I make no apology for devoting most of this piece to the future of radio, since this seems much more likely to serve the interests of the hi-fi fraternity.

All the current media excitement is concentrating on a dozen or more new television channels that are expected to become available over the next year or so. However, the future here is far more vague, and hi-fi relevance difficult to spot, particularly with all the horse-trading still going on over transmission standards and commercial alliances. At the time of writing we still don't even know how much of 1989's TV output will carry stereo soundtracks!

It is certainly likely that more musical programming will become available through television, though from which satellite and under what conditions must remain to be seen. The 'pop video' has become part of the staple diet of several cable services hitherto, not to mention through-the-night ITV. Satellite TV is bound to bring us more of more or less the same. Serious music fans could well find an increase in programming too – less perhaps in orchestral terms than in more visually oriented arts such as opera and ballet.

Ultimately the battle for stereo soundtracks has to be won before the new television services are going to turn many hi-fi heads. Given that the NICAM system works well for the current PAL TV transmission system, and that the MAC system incorporates at least one digital stereo audio bitstream per TV channel, the capabilities are virtually all in place. What is needed is the necessary will on the part of the broadcasters to break us out of the current equipment/programming chicken-and-egg deadlock.

**TEAC**



*The input most people don't bother with*

*But your  
TEAC stockist  
has all the  
answers*

Better quality audio can only be found  
at better quality audio dealers

**TEAC**

TEAC UK Ltd., 5 Marlin House, The Croxley Centre, Watford, Herts WD1 8YA.  
Tel: 0923 225235. Fax: 0923 36290. Telex: 915417 TEAC UK G.



A -X75 DC INTEGRATED STEREO AMPLIFIER

"Sound quality was always pleasing and analytical with inherent noise totally inaudible.  
All the test measurements produced good results in line with the maker's specification"  
Gramophone August 1988



ZD-880 COMPACT DISC PLAYER

"The ZD-880 should win a lot of friends both in terms of its ergonomics  
and, undoubtedly, its first rate overall sound" Gramophone April 1988



V970X STEREO CASSETTE DECK

"The electronics are evidently of as high a standard as the transport and all these things  
come together to result in a machine with real class" Hi Fi Choice April 1988

LISTEN AND YOU'LL SEE

# B&W LOUDSPEAKERS 500

S E R I E S

The 500 Series. A new era of B&W monitors created to succeed our world-beating 100 Series. Four new models embodying the fruits of our latest research through the music that inspired them.



**B&W**  
LOUDSPEAKERS

DM560 DM580 DM550 BM570