

# HI-FI CHOICE

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

DECEMBER 1989 £2.95

## CD MIDI SYSTEMS

20 NEW MODELS  
REVIEWED

OVER

## 900 TEST SUMMARIES

IN THE CHOICE  
BUYER'S GUIDE

## VALVE AMPLIFIERS

GLOWING ON TEST

## BEST BUYS AWARDED

WE CHOOSE  
THE BEST BUYS  
AND RECOMMENDED  
PRODUCTS

# FREE

JVC 90-MINUTE  
CASSETTE TAPE

# FREE

JVC TAPE  
IF YOU CAN READ THIS  
YOUR TAPE IS MISSING

ISSN 0955-1115



9 770955 111007



SOUND AND STYLE



# REACH FOR THE BEST



## RT830AL LW.MW.FM STEREO ANALOGUE TUNER

Designed to complement performance amplifiers the RT830AL offers a stunning performance for its price. Its modest appearance, operating simplicity and manual tuning belie the sophisticated circuitry employed.



## RT850AL LW.MW.FM STEREO DIGITAL TUNER

The definitive tuner in its class. Designed to provide very high standards of radio performance and musical quality with the convenience of push button tuning and 16 station selection. Nominated by *What Hi-Fi* magazine for *Best Tuner of the Year 1990*.



## RT870L LW.MW.FM STEREO AUDIOPHILE TUNER

The audiophile tuner for those seeking even higher standards of radio reception and musical performance. Designed to extract the best from the quality radio broadcasts available throughout the UK today.

These fine components are but a small selection from Rotel's award winning range of performance Hi-Fi Products which offer very high standards of technical excellence and musical enjoyment. Phone or fax Rotel UK for further information and nationwide dealerlist.

UK DESIGN AND DEVELOPMENT

ROTEL UK,  
25 Heathfield, Stacey Bushes,  
Milton Keynes, MK12 6HR.  
Tel. (0908) 317707 Fax. (0908) 322704

**ROTEL** *Hi-Fi*

Ask someone who knows...



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

# HI-FI CHOICE

ISSUE NUMBER 77: DECEMBER 1989

EDITOR:

John Bamford

CONSULTANT EDITOR

Paul Messenger

ASSISTANT EDITOR

Jane Hadley

NEWS EDITOR

Dan Houston

REVIEWS EDITOR

Jason Kennedy

CONTRIBUTORS

Alvin Gold, Paul Miller

ART EDITOR

Kerry Gormley

PHOTOGRAPHY

Chris Richardson

ADVERTISEMENT MANAGER

David Reynolds

ASSISTANT ADVERTISEMENT MANAGER

Daniel Roper

ADVERTISEMENT EXECUTIVE

Miriam Young

ADVERTISEMENT PRODUCTION MANAGER

Kathryn Balchin

PRODUCTION MANAGER

Judith Middleton

SUBSCRIPTION FULFILMENT MANAGER

June Smith

NEWSTRADE CIRCULATION MANAGER

Stephen Ward

PUBLISHING DIRECTOR

Marianne McNicholas

ADVERTISEMENT DIRECTOR

Alistair Ramsey

GROUP PUBLISHING DIRECTOR

Richard Howell

GROUP CREATIVE DIRECTOR

Tony Spalding

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.

A



PUBLICATION

Enquiries regarding the content of this journal should be made in writing to *Hi-Fi Choice* Editorial, 14 Rathbone Place, London W1P 1DE. We regret enquiries cannot be dealt with by telephone. While every care has been taken in the preparation of this journal, the publishers cannot be held responsible for the accuracy of the information herein, or any consequence arising from it. Readers should note that all judgements have been made in the context of equipment available to *Hi-Fi Choice* at the time of review, and that 'value for money' comments are based on UK prices at the time of review, which are subject to fluctuation and are only applicable to the UK market. This edition © 1989, Felden productions. ISSN No. 0955 111 5.

## MENU

**T**raditionally at this time each year we ask one of our hi-fi reviewers to test a batch of midi systems – packaged systems which these days inevitably include a compact disc player. This year not all the systems we've examined are strictly 'midi' systems, a couple are probably better described as stylish music centres. Nevertheless, they still fulfil the main required function of providing a complete audio set-up – including FM stereo radio and (usually) twin cassette tape decks – at reasonable cost.

As you will see from the reviews the systems vary wildly in their music making abilities. So even though inexpensive 'packaged' systems rarely purport to being great hi-fi, some are clearly better value than others and it will pay to choose wisely. And remember, if you can invest the time and trouble to assemble a system made up of separate hi-fi components, you'll invariably end up with a much better sounding system. To the 'hi-fi novice' this may seem a daunting task, but specialist hi-fi dealers are only too willing to help take the hassle out of choosing component systems. You don't have to understand how hi-fi works to enjoy top quality sound.

Some of us, of course, once bitten by the hi-fi bug, become only too keen to understand why apparently similar-looking hi-fi components should sound different to one another. For example, the anatomy of today's compact disc players is changing rapidly, and in this issue we've set out to explain the difference between 'multi-bit' and 'bitstream,' digital processing systems used in various models. And for those enthusiasts for whom only the best possible sound quality will suffice, we've also been testing a batch of valve amplifier components. Some of these are reviewed in this issue, more will follow next month alongside the results of our latest loudspeaker listening tests. We've been auditioning 30 current loudspeaker models, many of them brand new arrivals on the market.

While this month's *Choice* includes a **free** C90 cassette tape from JVC, next month's edition will include the opportunity to send away for *another* free tape – this time an SKC QC90. It's another issue you really mustn't miss!

*John Bamford*



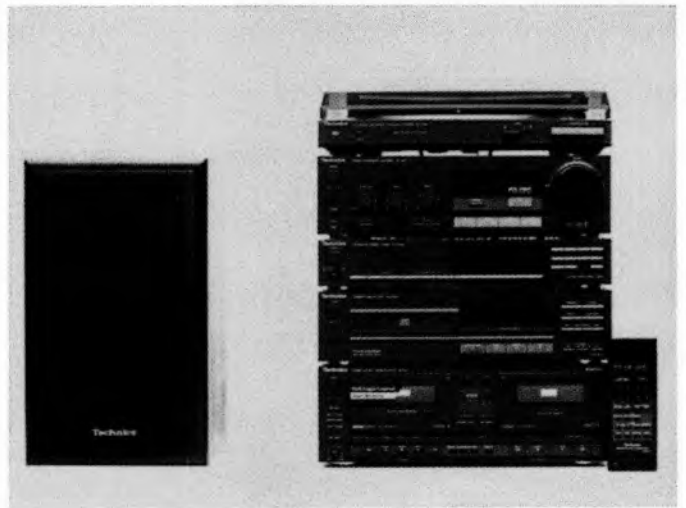
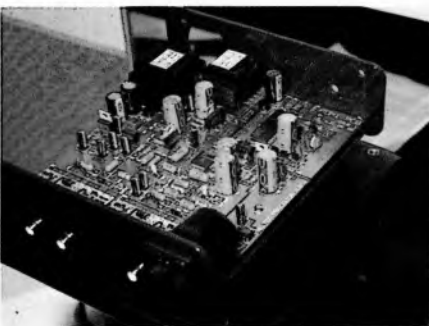
Cover photograph of the Yamaha Astarte system (see page 112) by Chris Richardson.



# CONTENTS



*Aspirations visits a purist audiophile (above) while loads of people visited the Penta Show to see goodies like this DAC from Deltec (below). Bottom: a Session with the Rock Reference and our yearly look at midi-systems (right).*



37

## READERS WRITE/CHOICE ANSWERS

More untangling of those complicated hi-fi problems by the audio agony aunt.

## ASPIRATIONS

22

**A VOYD FILLED WITH SOUND**  
After three through-the-house systems it's time to visit a purist audiophile who owns a Voyd, Audio Innovations and Snell set-up.

## PERSPECTIVES

28

**ONE BIT AT A TIME**  
Have you got to grips with CD player technology? Here Paul Miller sets out to explain the difference between multi-bit and bitstream digital processing.

## CD MIDI SYSTEMS

42

**MARKET RESPONSE**  
Dan Houston's dealer survey on reliability, popularity and current trends in the CD Midi System market.

45

**CHOOSING AND USING CD MIDI SYSTEMS**  
An overview of what's what from Alvin Gold.

## THE FRONT END

7

### UPDATE

The latest hi-fi technology, product and business developments, and taking in some of the highlights of The hi-fi show at Heathrow Airport's Penta Hotel.

16

### CHOICE SESSIONS

Ariston, purveyor of fine turntables, now has a CD player, while Townshend International has a new Rock Reference. And meet the blaster to blast all blasters from Sanyo (complete with 'bass accelerator').





Valve amplifiers are an enthusiast's quarry (left) and specialist interconnect cable (our offer below) is worth its weight in sound improvement.

## 48

### CD MIDI SYSTEM REVIEWS

Alvin reports on the merits of 20 different packaged systems.

## 115

### TECH TALK

A more detailed explanation of our reviewing and test bench procedures.

## 119

### CONCLUSIONS, BEST BUYS AND RECOMMENDATIONS

Who made the grade? Alvin rounds up the mammoth task of testing this month's systems with an easy-reference listing of the best and a brief synopsis on each.

## VALVE AMPLIFIERS

## 123

### CHOOSING AND USING VALVE AMPLIFIERS

Ahh . . . real hi-fi. John Bamford offers advice on what to look for with these, sometimes finicky, glowing beasts.

## 125

### VALVE AMPLIFIER REVIEWS

Can First World War technology really match up to contemporary equipment? Apparently it can. JB has been listening to more tube amps – we've five reviews this month, and another handful in the next issue.

## THE DIRECTORY

## 136

### SELECTED DEALER DIRECTORY

A regional listing of specialist dealers who can help you find that just-right sound.

## 145

### THE CHOICE DIRECTORY

A comprehensive listing of all the currently available equipment we have reviewed, including prices, comments and value ratings.

## CHOICE MATTERS

## 14

### BACK ISSUES

We look at a vast amount of equipment every year. For details on other topics or issues turn to this page.

## 15

### COMING UP

Next month Paul Messenger reviews 30 new loudspeakers; we cover a batch of personal stereos and more valve amps; there's yet another free cassette tape offer plus the fourth in our Choice Cuts supplements on music – this time on collectable rock records.

## 33

### VALVE AMPLIFIERS AND BLENDABLE CABLES SPECIAL OFFER

A *Choice*-discounted range of sensibly-priced cables and accessories from Quantum Audio, to get the best performance from your system.

## 41

### OPUS 3 CDs

Save money on the range of world famous Opus 3 audiophile CDs including the wonderful test recordings 'Dynamics' and 'Depth of Image'.

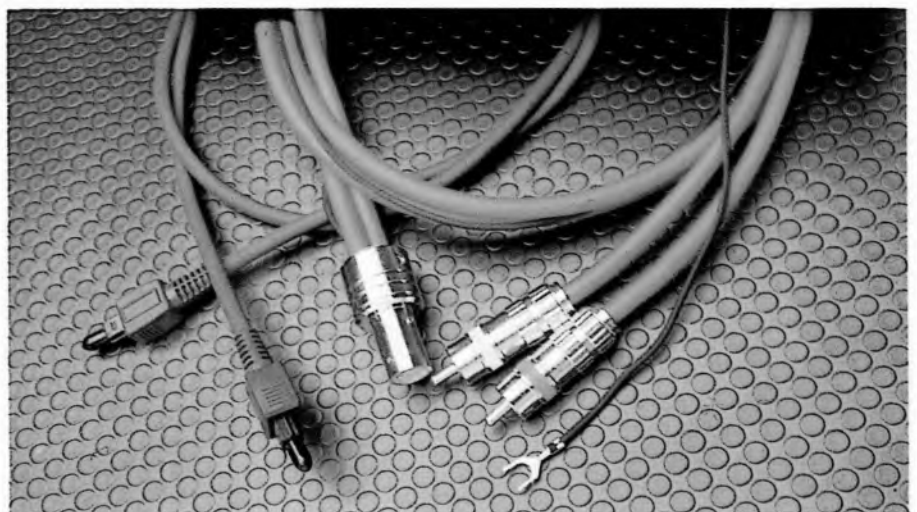
## 176

### PERSONAL MESSAGES

Paul Messenger rounds off the magazine with a look at SD Acoustics' recent modifications to the distinctively designed *OBS* loudspeaker.

## FREE TAPE

This month we've another gift for *Choice* readers – a JVC 90-minute cassette tape. It's absolutely FREE with your copy of the world's No. 1 guide to buying hi-fi!



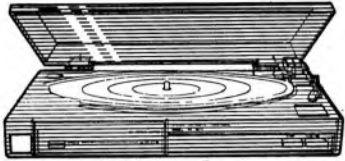


**RICHER**  
*Sounds*

# HI-FI SALE!

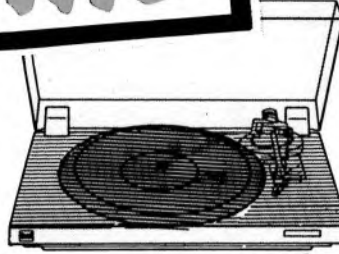
## SALE BARGAINS

To Hi-Fi Choice readers here's dozens of items reduced to clear in our tremendous pre-Christmas sale. Use the coupons below, for some of these extra-special discounts and don't forget there are loads of bargains marked down in-store too in our crazy Christmas Clearance. See you soon.



**JVC ALE15 Turntable** Another budget beater from Richer. It's fully automatic, belt-driven and utilises a DC motor for silent operation. Cart £5 extra.

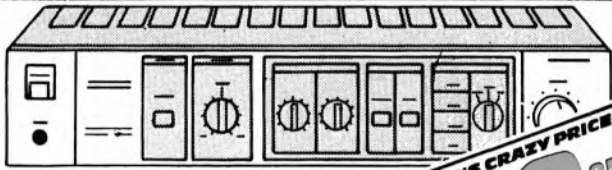
**SALE COUPON PRICE**  
**£29<sup>95</sup>**



**DUAL CS503.1** This high performance, low priced, impressively made German turntable brings new standards to the UK. Ortofon Cart only £10 extra.

**SALE PRICE CENSORED!**  
Please 'phone sitting down for unbelievable price!

**ALSO CS505.3 CENSORED!**



**SANYO JA220 Amplifier** 20 watts of music power! Featuring bass/treble controls, tape monitor and a respectable THD of only 0.9%, what more could one desire??

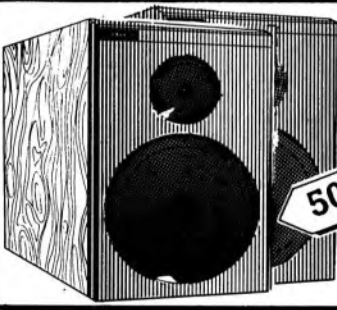
**RICHER'S CRAZY PRICE**  
**£49<sup>95</sup>**



**MARANTZ ST35L Tuner** This attractive three-band tuner from Marantz's audiophile range includes the refinements you'd expect from a much more expensive model.

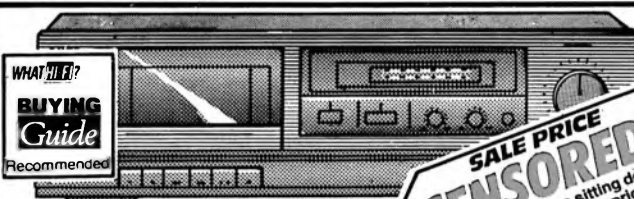
**SALE COUPON PRICE**  
**£79<sup>95</sup>**

**FACTORY REPACK**



**GOODMANS LOEWE G50 Speakers** Manufactured to satisfy hardened bargain-hunters nationwide, this low priced 2-way design makes a sensible choice.

**50wpc!**  
**SALE COUPON PRICE**  
**£49<sup>95</sup> Pair**

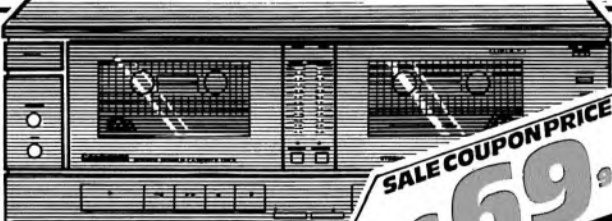


**AIVA ADF270 Cassette Deck** The professional's choice, for price and quality this deck's a winner: featuring Dolby\* B&C, fine bias control and auto tape select!

**SALE PRICE CENSORED!**  
Please 'phone sitting down for unbelievable price!

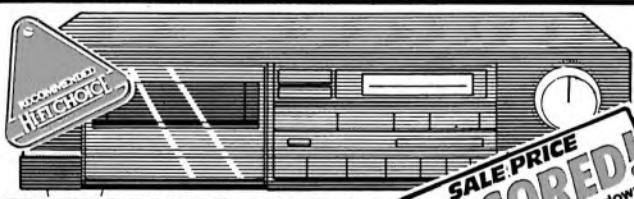
**WHAT TO BUY?**  
**BUYING Guide**  
Recommended

**You can get some amazing bargains**  
*What Hi-Fi? Magazine*



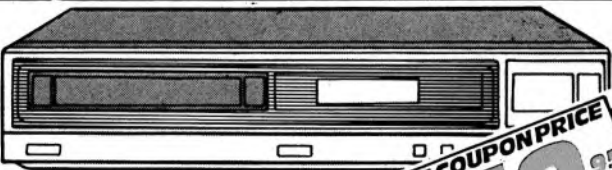
**GOODMANS GSW5200 Cassette Deck** At this price it must be stolen! No, bulk buying's the answer on this fantastic twin with high-speed & synchro dubbing.

**SALE COUPON PRICE**  
**£69<sup>95</sup>**



**TECHNICS RSB355 Cassette Deck** Attaining rave reviews this smart microprocessor-logic machine boasts 2-motor drive and Dolby\* C noise reduction for the best possible sound.

**SALE PRICE CENSORED!**  
Please 'phone sitting down for unbelievable price!



**SANYO CP33/CP17 Compact Disc** An incredible deal that'll excite even the most dooby-down audiophiles after a hard days night. Throw a disc at it and allow it to seduce your ears.

**SALE COUPON PRICE**  
**£79<sup>95</sup>**

**FACTORY REPACK**



**PHILIPS CD582** This expertly engineered CD player has "Best Buy" status, infra-red remote control, 20 track programming and 4-times oversampling. Beat that!

**SALE COUPON PRICE**  
**£129<sup>95</sup>**

**WE GUARANTEE TO BE THE CHEAPEST...**



# CHRISTMAS CLEAROUT... EVERYTHING MUST GO!

These prices are extra special to HFC callers only so don't forget to bring / mention this advert. Stocks are limited, most items are in sealed boxes, others are ex-display or mail order returns but are fully guaranteed 1 year.

TURNTABLES	
Cartis £5 extra.	
Tensai TS705 Damaged YO	£19.95
Hitachi HT7 LI	£19.95
Fidelity RD200 YO	£19.95
Hitachi HTMD30 DC All	£19.95
Pioneer PL110 DC YO	£19.95
Tensai TS505 Damaged LB	£19.95
Sanyo TPM15 LB	£29.95
Aurex SRV34 All	£29.95
Pioneer PL233 BI	£29.95
Dual CS2110 LI,CA,LB	£39.95
JVC ALE300 All	£39.95
Kenwood KD37R All	£39.95
Marantz TT151 ED	£39.95
Fisher MT35 LI	£44.95
Yamaha P09 All	£49.95
Pioneer PL333 BI,CA	£49.95
Marantz TT873 BI	£49.95
Fisher MT6360 LB	£49.95
Marantz TX51 LB	£49.95
Pioneer PLX230 LB	£49.95
Dual CS502.2 deluxe LB	£59.95
Nad 5120 parts missing CA	£59.95
Fisher MT225 LI	£69.95
Pioneer PLX430 LB	£69.95
Yamaha TT300 CA	£69.95
Dual CS503.1 no lid ST	£69.95
Yamaha P31 LI	£89.95
Thorens TD321 BI	£149.95

CASSETTE DECKS	
Marantz SD243 DC BI	£29.95
Fisher CRW35 All	£49.95
Kenwood X5WX DC ST	£49.95
Marantz SD155 LE	£59.95
Hitachi DMD22 ST	£59.95
Goodmans GSW5200 All	£69.95
Teac V275 LE	£79.95
Kenwood KX55W SW	£79.95
Marantz SD285 LB	£79.95
Marantz SD255 LB	£79.95
Teac W375 All	£79.95
Aiwa ADWX505 BR	£89.95
Akai HXR40 SW	£99.95
Denon DRM07 ST	£99.95
Kenwood KX66 SW	£99.95
Teac W355 CA,LE,ED	£99.95
Denon DRM10 Damaged door ST	£99.95
Kenwood KX96W LB	£99.95
Rotel RD835 LE	£109.95
Technics RSB355 All	£119.95
Yamaha K340 CA	£119.95
Kenwood KX660HX LI	£119.95
Fisher CRW863 BI	£129.95
Marantz SD451 ST	£129.95
Yamaha KXW202 CA	£129.95
Marantz SD460 LB	£129.95
Sansui D550 LE,LI	£129.95
Kenwood KX747 LE	£139.95
Rotel RD855 ED	£149.95
Kenwood KX770 CA	£169.95
Marantz CP430 Portable ST	£199.95
Kenwood KX1100SG ST	£199.95
Onkyo TA2140 LI	£269.95

AMPLIFIERS	
Fisher CA55 BI	£39.95
Fisher CAM23 SW	£39.95
Sanyo JA220 All	£49.95
Sanyo A36 BI	£49.95
Sanyo JA550 ED	£49.95
Goodmans GSA5200 All	£59.95
JVC AX111 All	£69.95
Kenwood KA56 SW	£69.95
QED Midimate booster amplifier	£69.95
Akai AMA302 LB,BI	£79.95
Pioneer A331 ST	£79.95
Sansui AUX201 ED	£79.95
Yamaha AX300 SW	£89.95
Kenwood KA76 SW	£99.95
Marantz PM25 LB,LI,SW	£99.95
Fisher CA272 100W/LI	£99.95
Technics SU700 LI	£99.95
Kenwood KA94 SW,YO	£119.95
Pioneer AX707 SW	£129.95
Philips FA568 ex-display ST,LE	£139.95
Sansui AUX301 SW	£149.95
Hafner Pre-100 BI	£149.95
Yamaha AX500 LE	£149.95
Fisher CA891 LB	£149.95
Hitachi HT / HMA120 ED	£199.95
JVC ML / PL100	£799.95

TUNERS	
Sanyo JT222 DC LB	£9.99
Marantz ST243 DC All	£19.95
Pioneer FX68 DC BI	£29.95
Pioneer TX301 BI	£59.95
Goodmans GST5200 All	£59.95
Philips FT565 ST	£69.95
Philips FT772 BI	£69.95
Marantz ST35L All	£79.95

COMPACT DISCS	
Sanyo CP17 All	£79.95
Sanyo CP33 All	£79.95
Fisher AD823 LB	£79.95

EQUALISERS	
Akai EAM77 YO	£39.95
Marantz EQ351 All	£49.95
Teac EQA3 SW	£49.95
Fisher EQ875 ED	£79.95
ADC Memory 5 ST	£79.95
Onkyo EQ140 LE,CA	£79.95
Fisher EQ276 SW,LI	£79.95

SPEAKERS	
Aiwa SX10 LB	£15.00pr.
Sanyo SXW7 damaged BI	£19.95pr.
Hitachi S50 All	£29.95pr.
Sanyo SXM15 LB	£39.95pr.
Hitachi SX36X ED	£39.95pr.
Goodmans / Loewe G50 All	£49.95pr.
Rotel RL810 All	£69.95pr.
Philips SB561 damaged LE	£69.95pr.
Rotel RL850 damaged LE	£79.95pr.
Videotone DC2950 damaged LE	£99.95pr.
Videotone DC2580 L.I,ED,CA	£99.95pr.
Interfunk IF2120 CA	£99.95pr.
Technics SB3670 LE	£119.95pr.
StudioPower MC200 damaged LE	£149.95pr.
Tannoy M20 Gold All	£169.95pr.
Studio Power MC300 SW	£249.95pr.

MIDI SYSTEMS	
excl.spkrs unless indicated	
Fisher S35 LI,BR	£99.95
Sanyo W8 ED	£99.95
Hitachi HRDM16 not / t LE	£99.95
Sanyo DCXW40 LE	£99.95
Sanyo W17 ED	£119.95
Sanyo DCXW18 ST,CA,BR	£119.95
Hitachi HRDM26 not / t LE	£119.95
Sanyo S266 YO	£129.95
Toshiba SL3047 inc.spkrs BR	£129.95
Aiwa CP888 LI	£149.95
Akai 300 BI	£149.95
Sansui 500 BI	£149.95
JVC W2 LE	£149.95
Fisher M67 CA	£169.95
Sanyo S366 CA,SW,LE,LI,YO	£169.95
Marantz MX263 not / t SW	£179.95
Marantz MX243 ST	£199.95
Aiwa V770 inc.spkrsLE	£199.95
JPS 5900CD ST	£199.95
Kenwood M32 LE	£249.95
Marantz MX673 LE	£499.95

TURNTABLES	
Fidelity CD202 ED	£79.95
Toshiba XR9017 LB,LI	£89.95
Sharp DX610 All	£99.95
Fisher AD874 SW	£99.95
Aiwa DXM45DC ST	£99.95
Marantz CD45 ST	£99.95
Goodmans GCD550 multiplay	£99.95
Hitachi DA400 LB	£99.95
Goldstar GCD613 LI	£99.95
Marantz CD56 FR All	£99.95
Marantz CD54 LB	£119.95
JVC XLV220 LB	£119.95
Rotel RCD820BX LB	£119.95
Kenwood DP460 SW	£119.95
Teac PD250 YO,LB,ST	£119.95
Kenwood DP860 SW	£129.95
Toshiba XR9037 LB	£129.95
Marantz CD65 ST	£139.95
Toshiba XRV22 ST	£139.95
Dual CD1035 All	£149.95
Marantz CD73 gold LB	£149.95
Marantz CD73 SE LB	£149.95
Rotel RCD810 CA,ED	£149.95
Rotel RCD820B LE	£159.95
Dual CD1030RC L.I,CA,LE,ST	£159.95
Marantz CD883 All	£159.95
Pioneer PD281 SW	£169.95
Onkyo DX330 LI,SW	£199.95
Kenwood DP1000 LB,BI,LI	£199.95
Marantz CD75 DX LB	£199.95
Sansui CDX501 CA	£199.95
Marantz CD75 no r / c BI	£199.95
Philips CD960 LE	£349.95

PHILIPS	
Philips FT566 CA	£79.95
Kenwood KT660 LB	£79.95
Akai ATS7 BI	£89.95
Onkyo T4130 LI	£89.95
Yamaha TX500L All	£99.95
Fisher FM273 ED	£99.95
Kenwood T91 LI	£99.95
Yamaha TXL400 LI	£99.95
Harman Kardon TU911 BI	£119.95
Sansui TUX301 LI	£119.95
Hitachi FTMD5500 LE	£129.95
Marantz ST64L SW	£199.95

**0% FINANCE** on all systems subject to simple clearance.

FREEPHONE 0800 591 366  
24hrs FOR YOUR FREE COPY OF OUR BARGAIN-PACKED FUN CATALOGUE / PRICE LIST

**HALF PRICE 3 YEAR WARRANTIES**

available on Turntables, Amplifiers, Cassette Decks, Tuners, Receivers and Equalisers ONLY

**£9.99** for items up to £100 **£14.99** for items over £100 **WAS £19.95**



## WE ARE THE SYSTEM SPECIALISTS

We pride ourselves in being able to put together a proper hi-fi separates system from as little as £79.95. Although admittedly quite basic, thousands of our customers have started on the hi-fi road with a system similar to this comprising a turntable, cartridge, stereo amp and a pair of speakers.

For customers with a little more to spend we offer a second to none selection of hi-fi separates, specialist friendly service, and of course our world renowned value for money! We will happily arrange Interest Free Credit subject to status, give you generous packages of free accessories depending on the size of your purchase, and a price beat promise that's unbeatable (and is valid even after you've purchased your equipment!)

We welcome part exchange and can despatch (via Securicor) to anywhere in the country. If you live near to our shops we can deliver by hand and advise / help with installation and setting up.

We genuinely believe we offer the best all round system deal, why not give us a try?

**£10 OFF**

Our in-store price of £39.95 on the JVC ALE15 Turntable.

Our in-store price of £89.95 on the Sanyo CP17 or CP33 CD

with this coupon.

---

**£20 OFF**

Our in-store price of £69.95 on the Goodmans Loewe Speakers

Our in-store price of £99.95 on the Marantz ST35 Tuner.

Our in-store price of £149.95 on the Philips CD582 CD.

with this coupon.

<b>BIRMINGHAM</b>	10 Smallbrook Queensway, B5 4EN. Tel: 021 643 1516 (In front of Albany Hotel)	<b>LIVERPOOL</b>	Moving to new premises close to existing shop early November. Deal on shop not confirmed at time of ad. going to print. Tel: 051 708 7484
<b>BRISTOL</b>	20 Cotham Hill, BS6 6LF. Tel: 0272 734397 (50 yds Clifton Down Shopping Centre. Opposite 'Crockers Pub')	<b>LONDON CENTRAL</b>	2 London Bridge Walk, SE1 2SX. Tel: 01 403 1201 (10 lines) 01 403 4710 (above Duke St. Hill)
<b>CARDIFF</b>	5 Central Square. Tel: 0222 383311. (By the Bus Station)	<b>LONDON NORTH</b>	25 Northways Parade, College Crescent, NW3 (Bottom of Fitzjohns Ave) Tel: 01 722 3359
<b>EDINBURGH</b>	1B Chambers Street, EH1 1HR Tel: 031 226 3544 (Near the Royal Scottish Museum)	<b>STOCKPORT</b>	4 Wellington Street, SK1 3RN. Tel: 061 480 1700 (100 yds Stockport Station. 10 yds off the A6)
<b>LEEDS</b>	55 The Headrow, LS1 6LR. Tel: 0532 455717 (Opposite 'Lewis' Department Store)	<b>YORK</b>	6 Feasegate, YO1 2SQ. Tel: 0904 645535 Moving to larger, more accessible premises November at: 66 Walmgate. tel: 0904 645535.

**WE ARE OPEN:** 10-6pm Mon-Fri and 9-5pm Sats except London late 'till 7pm Thurs & Fri, 10-5pm Sats.

**WE WELCOME:** Access. Visa. Cheques (up to £1000 subject to status) and Part Exchange. Also VAT export (handling charge £2.50) All goods brand new in sealed boxes unless otherwise stated. inc. VAT and g'teed 1 year. E&OE. All stores have a clearance corner full of ex-display & secondhand bargains and browsers are definitely welcome! We guarantee to be the cheapest - If you've seen it elsewhere at a cheaper price within 7 days of purchase, we GUARANTEE to beat that price ON THE SPOT by £5. \*Must be in stock within 75 miles of your nearest store.

**WE LOOK FORWARD TO SEEING YOU SOON!**







## TECHNOLOGY

### CARUSO ON CD

A new series of 'acoustically recorded' compact discs have been released by Nimbus Records. The *Prima Voce* series uses a novel technique called 'Natural Ambisonic Transfer' to capture the greatest recordings made by famous voices from 1900 to 1939. The press release describes Natural Ambisonic Transfer as using Nimbus' own single ambisonic microphone recording technique combined with the principals of the horn gramophone. In other words, the original shellac 78s are played on a 1935 vintage hand made *Expert* acoustic gramophone using a thorn stylus, with the microphone placed in front of the horn!

Nimbus (probably rightly) believes that 78 rpm records sound best on the equipment they were made for and have therefore tried to preserve as far as possible the acoustic elements in the recording chain. The company promises a better sound quality and 'vocal immediacy' on the new series than has been achieved so far with other transfers of 78s. The true sound of these historic recordings has been lost to generations brought up with electronic equipment and Nimbus hopes to bring the virtuosity of the great voices of the past – Enrico Caruso, Rosa Ponselle, Giovanni Martinelli and many more – to a wider digital-using audience. Two CDs a month are planned on top of the first five releases.



*Making a compact disc of that famous old horn sound.*

However, initial listening (admittedly on the office system) suggests that the compact discs will remain of limited appeal to audio enthusiasts; the compressed bandwidth and two-dimensional sound remains a barrier and one suspects that serious enthusiasts will continue to seek out both an acoustic gramophone and some of those elusive 78 shellac discs!

## PRODUCTS

### NEW LOOK EXPOSED

A midi-sized preamplifier and dedicated power supply

combination has been developed by Exposure Electronics, of Portslade, Sussex. The *XI* preamp and *XII* (power supply) are improvements on the Exposure *VII* and cost £580 and £520 respectively. Together with the Exposure *Super VIII* stereo power amplifier they make a natty matching stack which is already becoming the firm's best selling combination.

### HOME-FIRESIDE LOUDSPEAKERS

You can almost hear the crackle of one of Churchill's wartime radio statements when looking at this new range of 'period' loudspeakers from HGM Sound in Cheadle, Cheshire. Originally launched to cater for architects designing period interiors in public places, such as cafes or courtrooms, the range of six Nostalgia loudspeakers has been modified to cater for the more



*Midi-sized preamplifier combination from Exposure.*



*Olden day looks, modern day sound with these HGM loudspeakers.*



discerning domestic user. The first in the range of these Glenn Miller era loudspeakers to offer PA-plus performance is the Nostalgia *Continental* – a two-way ported design housed within the high-impact resin moulded exterior.

Malcolm Rusby, HGM Sound's research and development manager said the *Continental* offered 55Hz to 18kHz performance at a maximum price of £240 a pair. "We hadn't really thought of the domestic market until people started coming to us saying: 'I've got to have those'. So we're developing the others in the range for better sound quality, though they'll still be in the same cabinets," he said. The resin cabinets are stained to give the patina of old wood and also feature 'slightly flawed' dovetail joints to convince most that they are indeed hand-made from ply. The rest of the range should be available in the new year. HGM Sound: (0457) 63268.

## BIGGER BOSE RANGE

Loudspeaker maker Bose kicked off the season with six new models shown at the Penta show. Two new *Acoustimass* systems – the £429 *3* and £549 *SE-5* reflect the growing trend for tiny 'satellites' with hidden bass units. The cheaper *3* is an even smaller version of the units used in the *Acoustimass 5*, while the *SE-5* uses a redesigned cube incorporating a 'stereo targeting'



B&W's Acoustitune subwoofer includes a set of tuning tubes.

array of drivers.

Also new are the £200 *Freestyle* bookshelf model and the Bose 305 – a £350 slot-ported model based on the 301. For the deeper pocketed the 901 Series VI and VI *Concerto* are flagships in the range retailing at £1,599 and £2,299 respectively. The *Concerto* is a limited edition model with piano lacquer black finish. Both these models come with their own mono-pod stands.

## TURNING ON THE GREEN LIGHT

It's all go at Roksan. After stealing the show at Penta with a room designed like a stage set, the company has launched a series of new components. The *Xerxes* record player is now supplied with a new power supply (*XPSII*) which promises all the refinements two years of research should bring. It can also be fitted to older decks for £150 including labour charges. The *XPSII* features a constant DC output for the *Artaxerxes* cartridge amplifier – available in 'early 1990' and said to offer a considerable improvement over the phono-stage of any pre-or-integrated amplifier.

There is also a new tonearm – the *Tabriz* – which includes much of the technology of the radical 'intelligently counterweighted' *Artemiz*. The *Tabriz* can be fitted with either the *Artemiz* or a conventional counterweight and is expected

before Christmas at a premium of under £200.

There are new stands for both the *Darius* and *Hotcakes* loudspeakers designed with room aesthetics in mind. Both stands hide unsightly trails of speaker cable inside the frame and the *Darius* version uses five spiked feet for stability. The new stand is a non-exoskeleton version though one suspects Roksan fans will still plump for the £345 highly unusual cage-like original.

*Hotcakes* can now be floor mounted using the (under £100) stands or you can wall mount them on brackets which retail at £12.95 a pair.

## DIY BASS

B&W Loudspeakers has developed a subwoofer system which can be tuned to cater for individual tastes. The £189 *Acoustitune* will boost the bass levels in most systems while remaining unobtrusive – it can be placed flat or vertically anywhere in a room. The subwoofer uses any of four tube lengths attached (with a bayonet mounting) to the port. By swapping the tubes one can match the sensitivity of the *Acoustitune* to any loudspeakers rated between 80 and 90dB. You can also experiment with both the size of the tubes and the positioning of the unit (near the wall gives more bass) to find the sound you most like.

Internally the system uses two face-to-face bass-drivers, driven out of phase, to overcome the problem of needing a high-mass driver with high-magnetic strength in a small enclosure. The *Acoustitune* weighs 12.5kg and is finished in vinyl black ash.

## TECHNICS FOR PARTY GIVERS!?

It certainly looks like 'having your own radio station' is a thing of the 'now'. Technics has released a multi-disc CD player which takes five CDs on a carousel type drawer similar to



Complete with piano black finish the Series VI Concerto costs £2,299.



Technics' carousel-type multi-CD player is party-friendly.

the Sony model. The inventive press release suggests that the £270 *SL-PC20K* is a must at parties. "Are you so engrossed with drinks, food and music that you never get a chance to welcome your guests? Here's the solution," beams the PR blurb.

The fully programmable machine offers the by-now-usual benefits of selective, sequential or random play with the status of what's happening being shown on a two-colour fluorescent screen. Superb sound quality is promised via Technics' new high resolution digital filter with four times oversampling and twin DACs (one for each stereo channel). An advantage of the carousel approach as opposed to the magazine type of multi-play machines, says Technics, is that (sticky fingers or not) you can replace discs on the tray without interrupting play.

## THE CAMBRIDGE SYSTEM

Things are happening at Cambridge Audio. The hitherto amplifier and CD player manufacturer has unveiled plans of a complete system line-up, including a cassette deck, loudspeakers and tuner by the spring of next year. First comes the replacement of the *CD2* compact disc player which arrived in the form of the *CD3* – shown at the Penta Show. *CD3* is a 16-bit 16 times oversampling machine described as a 'reliable' upgrade of the *CD2*. "Basically it's been relaid out internally. It keeps some of the original design

but its reliability is improved," said Steve Capes, for Cambridge. The new machine is now the only Cambridge CD player available and retails for £650. The firm was also planning a 16-bit 16 times oversampling outboard digital to analogue converter to arrive in November and hopes to be able to offer the complete Cambridge system by the spring of 1990. Complementing the existing range of six amplifiers a £200 digital AM/FM tuner should be in the shops by the new year, and some three-way loudspeakers (£400) and a two-head cassette deck (a British first) are planned for March.

## CURE FOR VCR BLUES?

Following the *TV Times*' and *Radio Times*' reluctance to publish bar-codes which would have made video programming easy for all, Philips has introduced an alternative 'easy-to-set' VCR, priced £379.



Goodbye bad back: One touch video programming from Philips.

The *VR6293* has its own decoder to bring BBC and ITV teletext pages up on screen. Using the remote control keypad a cursor can be moved on screen to cover the programme's starting time. By pressing a button all the details are stored in the VCR's memory and an on-screen display can be called up to

check you've got it right.

As well as allowing non-teletext TVs to receive the likes of Ceefax and Oracle the *'6923* can also record programmes with teletext subtitles – a boon for the deaf.

With all that at less than £400, it's a pity that Philips hasn't also brought out a Nicam Hi-fi version for real A/V buffs.

## BUSINESS

### SANSUI RE-ADOPTED

Sansui products have at last found a home in the UK – c/o Ejam which distributes Sharp, Philips, Pioneer and Panasonic equipment among other electronic household names. Sansui was handled by Hi-Fi Markets until May this year. Sansui Distribution is the name of the new company which acts as a subsidiary of the Tokyo manufacturer. The company's



On top of the situation: This new Cambridge CD player will shortly be joined by a cassette deck and tuner.

## IN BRIEF

Quad's new CD player and 66 preamplifier can be heard at a musical evening on November 23rd in the Sandhurst Hotel, Grand Parade, Eastbourne, organised by Jeffries Hi-Fi. A Naim evening will also be held in Brighton. For tickets telephone: (0323) 31336.

Beaver Hi-Fi has changed its name from Beaver Radio and has revamped its central Liverpool store to provide more space for separates with a purpose-built demonstration room.

Scotch is giving away free cinema tickets with its five-packs of *BX C90* or *CX C90*, and its three-packs of *X5//* chrome audio compact cassettes. With two vouchers from these packs (bought before January '90) you qualify for two tickets to the flicks at Cannon and Odeon cinemas, valid until August 1990.

Goldring has completed its *1000 Series* of moving magnet cartridges, adding the £60 *1022* and £85 *1042* to the £40 *1012* (mentioned in July). The cartridges all use a one-piece Pocan body – a glass-reinforced Polyester – to combine rigidity with the ability to bolt them tightly to the tonearm headshell.

Hi-Fi Experience, the Leamington Spa specialist, has moved to new and larger premises just across the road from its site for two years in Park Street.

The range of Audioquest *Drive Wire* 'speaker cable for In Car Entertainment systems is being distributed by Hayden Laboratories to complement the Denon ICE systems. Arcam will continue to market Audioquest's *Live Wire* domestic speaker cable.

Oxford Audio Consultants is holding two musical evenings featuring Absolute Sounds equipment (eg the new baby Apogeos) on Tuesday November 14th and Monday November 20th starting at 7.30 pm. Free tickets: (0865) 790879.

Wharfedale is to sell its own loudspeaker driver components for use by other manufacturers. The company also plans to supply drivers for PA equipment and complete loudspeakers for manufacturers using their own brand names.

Upmarket specialist shop The Sound Organisation has changed hands and will now trade under the 'Sound Organisation London' name – otherwise no change.

Agfa has a Christmas promotion for its *F-DX* range of audio tapes – you get five for the price of four.

Morgate Acoustics, in Westgate, Rotherham, Yorkshire, now stocks EAR amplifiers and SD Acoustics loudspeakers.

ATC Loudspeakers has taken on the distribution of North American Sumo loudspeakers and amplifiers in the UK, hitherto handled by Acoustic Gold.

Following reports in the local press that it was 'due to close in the near future', Reading Hi-Fi Centre wishes to publish the fact that it will 'be around for the foreseeable future'.

Aston Audio will be demonstrating the new range of Celestion ribbon loudspeakers at a musical evening on Thursday, November 30th at the Stanneylands Hotel, Wilmslow, Cheshire. The 90-minute demonstration will kick off at 8.30 pm. Tickets: (0625) 582704.



# THE POWERHOUSE EFFECT

## B&W'S ACOUSTITUNE SUBWOOFER BRINGS THE BIG SOUND EXPERIENCE TO SMALLER SPEAKER SYSTEMS

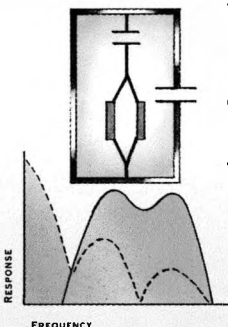
IF YOUR SPEAKER SYSTEM IS RELATIVELY SMALL, ITS ABILITY TO REPRODUCE THE LOWER OCTAVES IS LIKELY TO BE LIMITED. MAYBE TOO MUCH FOR YOUR SATISFACTION. B&W'S ACOUSTITUNE CHANGES ALL THAT.

NOW YOU CAN ADD THOSE MISSING OCTAVES BELOW 100HZ AND AUGMENT THE LOW FREQUENCY PERFORMANCE OF YOUR SYSTEM. WITH SENSITIVITY THAT CAN BE EASILY ADJUSTED, ROLLING OFF ABOVE 100HZ, SO THAT ITS SOURCE CANNOT BE LOCATED BY EAR.

### FINDING THE WAY

ACOUSTITUNE IS BASICALLY A SIMPLE AND INEXPENSIVE ACOUSTICALLY TUNED SUBWOOFER. DEVELOPING IT WAS NEITHER! B&W'S RESEARCH PROGRAMME EMPLOYED

ADVANCED COMPUTER AIDED DESIGN TO EXPLORE AND PREDICT VIRTUALLY EVERY COMBINATION OF ENCLOSURE AND DRIVE UNIT. THE RESULT: A BAND-PASS ENCLOSURE PRODUCED BY PLACING A HELMHOLTZ RESONATOR OVER THE FRONT OF A BASS REFLEX SYSTEM. THE

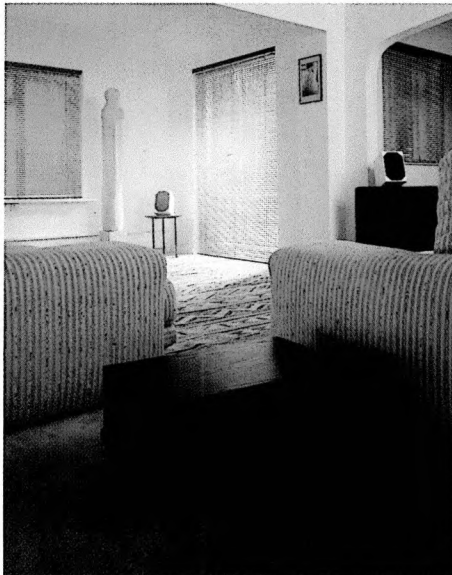
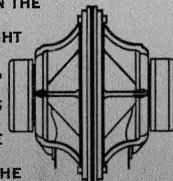


ADVANTAGE: GREATER SENSITIVITY AND FLEXIBILITY OVER A SIMPLE BAND-PASS SYSTEM WITH REDUCED CONE AMPLITUDE AT THE LOWER END OF THE BAND.

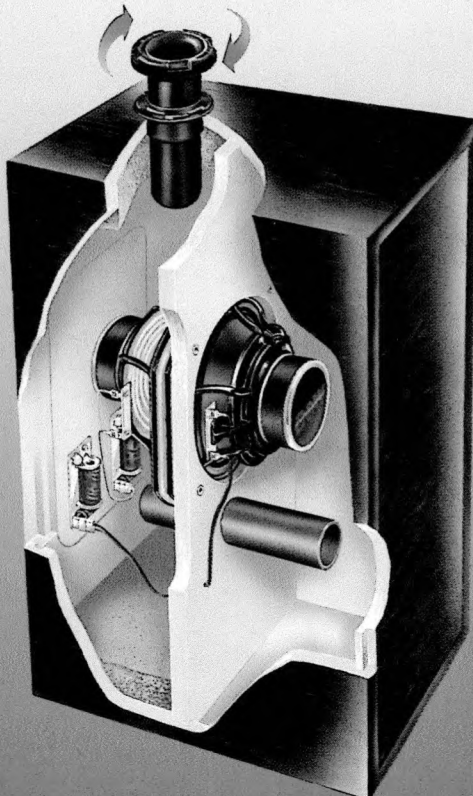
### ENTER THE SUPERDRIVER

TO KEEP THE ENCLOSURE AS SMALL AS POSSIBLE CALLS FOR A DRIVER WITH BOTH HIGH MASS AND HIGH MAGNETIC STRENGTH. THIS MEANT LITERALLY SPLITTING THE REQUIREMENTS OF THE DRIVER IN TWO SO CREATING WHAT IS IN EFFECT A 'SUPERDRIVER' — TWO BASS DRIVERS ASSEMBLED FACE-TO-FACE AND DRIVEN OUT OF PHASE.

THE TINY VOLUME OF AIR BETWEEN THE DUAL DRIVER UNIT PRODUCES TIGHT ACOUSTIC COUPLING WHICH, AT LOW FREQUENCIES, MAKES THEM BEHAVE AS IF THEY WERE GLUED TOGETHER. FEEDING THE LEFT CHANNEL TO ONE DRIVER AND RIGHT CHANNEL TO THE OTHER ACOUSTICALLY SUMS THE TWO STEREO CHANNELS OVER THE LOW FREQUENCY RANGE.



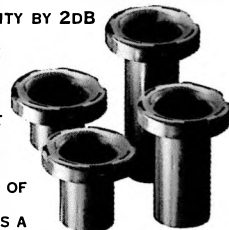
SINCE THE DRIVERS CREATE A 'PUSH-PULL' EFFECT, SECOND HARMONIC DISTORTION IS MUCH LESS THAN IN MORE NORMAL DRIVER CONFIGURATIONS WITH THE DRIVING FORCE RENDERED TOTALLY SYMMETRICAL. DISTORTION IS FURTHER REDUCED OVER A SIMPLE BAND-PASS SYSTEM, BECAUSE THE RESONANCE OF THE INTERNAL PORT REDUCES CONE AMPLITUDE AT LOW FREQUENCIES, PLACING LESS STRAIN ON THE SUSPENSION.



### VARY THE EXPERIENCE

ACOUSTITUNE COMES WITH FOUR SEPARATE PORT TUBE LENGTHS ALLOWING YOU TO SELECT JUST THE SENSITIVITY YOU WANT. THESE TUBES COUPLE THE HIGH ACOUSTIC ENERGY FROM INSIDE THE CABINET OVER THE LOW RANGE OF FREQUENCIES TO THE OUTSIDE WORLD.

EACH SUCCESSIVELY SHORTER TUBE INCREASES THE SENSITIVITY BY 2DB WITH HARDLY A CHANGE IN THE RESPONSE. WHICH MEANS THE ACOUSTITUNE SUBWOOFER CAN BE USED WITH ANY MAKE OR SIZE OF SPEAKER PROVIDED IT HAS A SENSITIVITY OF BETWEEN 80-90DB.

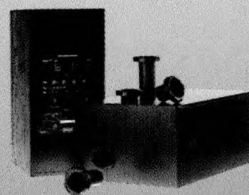


THE ACOUSTITUNE PORT TUBE SYSTEM ALLOWS FOR A REMARKABLE RANGE OF LISTENING EXPERIENCES, AND YOU CAN EXPERIMENT TO DISCOVER WHICH STYLE OF SOUND YOU PREFER. YOU MIGHT ENJOY THE EMPHASIS ON A MORE PROFOUND DOMINANT BASS, PREFER A SUBTLE BALANCE OR USE THE SUBWOOFER TO PROVIDE A LIGHTER FOUNDATION TO WHATEVER MUSIC YOU ARE PLAYING.

### ALWAYS AT HOME

NO SUBWOOFER IS MORE EASILY ACCOMMODATED IN THE HOME. PLACED FLAT OR VERTICALLY IT CAN BE HIDDEN DISCREETLY BEHIND FURNITURE, CURTAINS OR IN A CORNER.

THAT APART, YOUR SYSTEM WITH ACOUSTITUNE WILL BE SOMEWHAT LESS LAID-BACK IN PERFORMANCE. DISCOVER FOR YOURSELF THE POWERHOUSE EFFECT.



**B&W**  
LOUDSPEAKERS  
**ACOUSTITUNE**  
ACOUSTICALLY TUNED  
**SUBWOOFER**

B&W LOUDSPEAKERS (UK SALES) LTD  
MARLBOROUGH ROAD LANCING WEST SUSSEX BN15 8TR  
TEL. (0903) 750750

southern base is with Ejam in South Woodford, London, although two other wholesale distributors will handle Scotland and the North, and Northern Ireland.

## ENSEMBLE PRICE CUT

This year's Penta show saw a few reshuffles in the distribution of various products and a few quick name changes, one example being the disappearance of Ensemble UK (see our show report) and the emergence of The Final Upgrade as the distributor for Ensemble loudspeakers. The Final Upgrade is an audio consultant which specialises in highly customised installations and produces solid wood speaker stands for Ensemble *FAI* and *Reference* loudspeakers. The company also distributes the Graham unipivot tonearm and Solen amplifiers from France. The change of distributor has brought about a price drop for the Ensemble range – prices are now: *PAI*, £1,680; *Reference*, £2,680; *Primadonna*, £4,900.

The Final Upgrade, Suite 1, 48 Somerset Road, New Barnet, Herts, EN5 1RG. Tel: (01) 440 2588/(09277) 61918.

## PENTA '89

### AND THE SHOW GOES ON . . .

We said last year that the Penta hi-fi show had become the UK's premier showcase for new products – and this year's event was no exception. Sponsored as usual by *Hi-Fi News & Record Review*, the show at London's Heathrow airport featured literally dozens of new and exciting products from all around the world.

We mentioned in last month's *Choice* that both Wharfedale and Celestion had launched major new speaker designs and that Roksan once again stole the show with a really wild theatrical set in its exhibition room. Roksan's new products are explained fully in a separate story this month.

JK had his camera at the ready as we fought our way through the busy corridors; here are just a few of the products that we spotted on our travels . . .

Front ends first – and Absolute Sounds was showing the Krell *MD-1* 'CD Turntable' which is said to be something of a technological tour de force (at around the £5k mark plus outboard DAC it should be!), and an attractive new Well Tempered turntable and arm. Gamepath



*New lines at The Final Upgrade: hardwood 'speaker stands, Solen amplifiers and Ensemble loudspeakers.*

had brought along the new Oracle *Paris* turntable, a stylish new model from the French Canadians that costs a reasonable £595 including arm. In the same room was a brand new PDM CD player from Rotel, the £300 *RCD-865*.

Another bitstream product was Deltac's D/A converter, still in prototype form but due to be in the shops by December at a price of \$495. More variations on the same theme could be found on the Harman stand where they had the new HK CD players based

on the MASH (PWM) technology being used by Technics. There was no lack of enthusiasm for the new Radford CD player either.

Amongst a dazzling array of glamorous turntables was the *Arcici*, a triangular lead-filled design from the company that brought us the *Lead Balloon* turntable stand. Alongside the Ensemble loudspeakers we found the £2,000 Graham unipivot tonearm, and elsewhere a fully fledged Oxford *Crystallette* and even the OTT Wheaton *Triplanar* arm.



*Seen at Penta: (clockwise) Lindley loudspeaker, a new Well Tempered table, BB100 amplifier and Musical Fidelity's T1 tuner.*



There was probably even more activity on the amplifier front, with a marked trend towards expensive line-only integrated amplifiers. Not least of these is the *BB100*, an 18-valve design from Bill Beard under the guise of his new company named British Built Audiophile Products. Beard Audio meanwhile has been acquired by Accordant who was demonstrating the *P1000*, a multi valve power amp. More tubes could be found in the Ruark room where some tasty Classen amps from Germany were at work. Absolute Sounds had a pair of the formidable Jadis *JA500s*, and SD Acoustics, of whom more later, was using the new *G88* preamp from Esoteric Audio Research. VTL has also returned to these shores, care of Musical Paradigms (ex Ensemble UK) who have also taken on Mirage loudspeakers.

On the more affordable front, Linn was displaying but not playing the new *Intek* integrated amplifier and Oxford had the *OAC Mistrale* in action, a descendent of the late Incatech *Claymore*. A couple of new names to watch out for are Muse and JDI. The latter emanates from the US and is being distributed by Audio Concepts. 'Concepts was also playing the very competitively priced DCM loudspeakers, whose range includes the wonderfully named *Time Windows*. JDI on the other hand is a West Yorkshire company which has brought out a rather spectacular looking two-box preamp and a monoblock power amp.

There was of course no shortage of new loudspeakers: SD Acoustics was playing an impressive ribboned model which will cost close on £2,000, while one of the main events of the show was the unveiling of a new KEF *105/3*, looking like a grown up *104/2* and due to retail for around £1,700.

Another very interesting new speaker is the Lindley, a hi-tech design enclosed in a very high quality 'domestically friendly' cabinet of highly unloudspeaker-like appearance. The drivers, four tweeters and two mid/bass units, can be hidden by closing doors which otherwise fold around the sides of the seven sided cabinet when listening. Price is £6,950.

Elsewhere JPW unveiled a metal tweeter'd version of the *Sonata* called the *Sonata Plus* which costs £129, whilst further up the spectrum Quantum Audio was playing the rather tasty *Primare* loudspeaker. And, of course, the list goes on . . .





MANLY TIME BEFORE.

IN A PRICE YOU HAVE HAD

WILL BEVELL NEW SUBSTITUTES

A BAKING STORYTELLER

Imagine a man, sitting on a large wooden stage, holding a fan and a small, plain towel.

He's narrating a story that you know back to front. Do you think you would stay to listen?

In all probability, you would. Because the best Rakugo artists make old stories come alive. They add new detail and new subtleties to the narrative you expected.

At Aiwa, we believe a CD player should perform a similar function. A good player, we maintain, should bring new life to a familiar piece of music.

So we have designed the 18-bit XC-005 with an Eight Times Oversampling facility. It minimises interference, allowing the maximum information to be relayed from the disc.

And to keep the information in its purest form, it is transmitted through digital and optical outputs.

So don't be surprised to find an extra voice on a favourite piece of music. Or an unexpected instrument. Or a simple use of echo.

You may have heard the song many times before; the XC-005 will make you listen to it.

THE  
JAPANESE ART OF

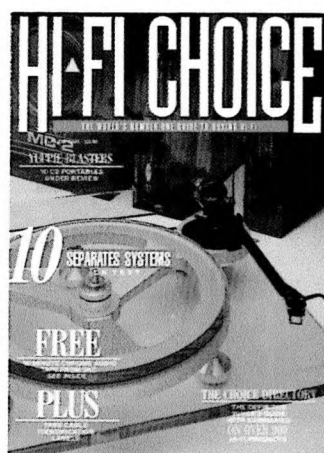
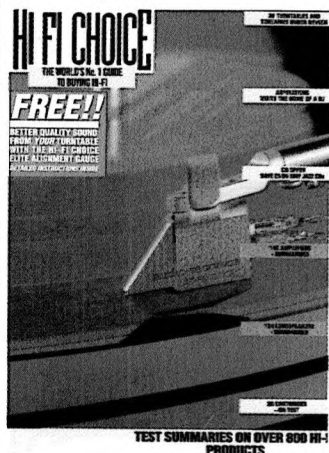
AIWA®





# BACK ISSUES

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



## TO ORDER BACK ISSUES:

Please tick those you require

- Jan 88  CD BASED MIDI SYSTEMS (54)  
Also includes: Cartridges  
Plus: Market survey on system building

---

- Feb 88  TURNTABLES & TONEARMS (55)  
Also includes: Tuners  
Plus: Headphones

---

- March 88  AMPLIFIERS (56)  
Also includes: Cassette tapes  
Plus: Personal stereos

---

- April 88  CASSETTE DECKS (57)  
Also includes: Valve amplifiers  
Plus: Hi-fi furniture

---

- May 88  CD PLAYERS (58)  
Also includes: Speaker stands  
Plus: Focus on Tweaking

---

- Aug 88  ONE-NAME SYSTEMS (61)  
Also includes: CD players  
Plus: In-car audio

---

- Sept 88  AMPLIFIERS (62)  
Also includes: In-car audio  
Plus: CD players

---

- Oct 88  CASSETTE DECKS (63)  
Also includes: Valve amplifiers  
Plus: Headphones

---

- Nov 88  COMPACT DISC PLAYERS (64) (with free CD)  
Also includes: Digital amplifiers  
Plus: Loudspeaker cables

---

- Dec 88  CD MIDI SYSTEMS (65)  
Also includes: Floor standing loudspeakers  
Plus: Tuners

---

- March 89  AMPLIFIERS (68)  
Also includes: Loudspeakers  
Plus: High-end in-car audio

---

- April 89  CASSETTE DECKS (69)  
Also includes: Cassette tapes  
Plus: Tweaking tactics

---

- May 89  CD PLAYERS (70)  
Also includes: Satellite and subwoofer loudspeakers  
Plus: Receivers

---

- June 89  LOUDSPEAKERS (71) (with free speaker supplement)  
Also includes: Hi-fi VCRs  
Plus: Radio Caroline

- July 89  THE COLLECTION (72) (with free Rock supplement)  
Includes: Reviews of state of the art equipment  
Plus: High end Aspirations

---

- Aug 89  SEPARATE SYSTEMS (73) (with free cable labels)  
Also includes: Yuppie Blasters  
Plus: Studer C37 rebuild, part one

---

- Sept 89  AMPLIFIERS (74) (with free Jazz supplement)  
Also includes: Miniature loudspeakers  
Plus: Focus on CD testing

---

- Oct 89  CASSETTE DECKS (75)  
Also includes: Headphones  
Plus: Studer C37 rebuild, part two

---

- Nov 89  CD PLAYERS (76) (with free Classical supplement)  
Also includes: Nicam televisions  
Plus: TV technology explained

---

- Dec 89  CD MIDI SYSTEMS (77)  
Also includes: Valve amplifiers  
Plus: Multi-bit and bitstream DAC technology explained

### COMING SOON

- Jan 90  LOUDSPEAKERS (78) (with free Collectables supp.)

---

- Feb 90  TURNTABLES AND TONEARMS (79)

---

- Mar 90  AMPLIFIERS (80)

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

### TO ORDER BINDERS:

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

### PAYMENT

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

Please charge my Access/Visa (delete as appropriate)

Credit card number \_\_\_\_\_ Expiry date \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Postcode \_\_\_\_\_

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

A & R • Audiolab • Ariston • Audio Technica •

## Bring along your own CD's or Records and hear what you've been missing!

Are you getting the best from your CD's and records? We invite you to come along and listen in comfortable friendly surroundings to your own personal favourites on any of our impressive array of equipment. Not only do we stock 'state of the art' equipment but also cater for those with more modest budgets. Our staff are knowledgeable, helpful and are always ready to help you in your selection of equipment. Why not call Richard, Graham, James or Chris for an appointment and you will be assured of a warm welcome.

**NEW**



**MISSION**  
**Cyrus**

**SIGNATURE**  
Cyrus 2/PSX combination in luxury BMW Black Diamond high gloss finish. Internal modifications resulting in greater sonic improvement.

### THE CYRUS RANGE — Amps and Speakers

Cyrus I	179.90	781	239.90
Cyrus II	29.90	782	339.90
PSX	229.90	Stands	79.90
Tuner.	299.90		

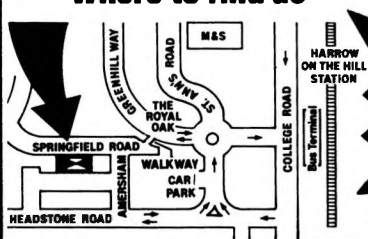
### THE MISSION RANGE — Loudspeakers

761	119.90	764	399.90
762	179.90	765	699.90
763	279.90	Solid Core	per m. 2.50

### THREE GREAT SYSTEMS

<b>TURNTABLE</b>	Dual 505 Mk 3.	Linn Axis+ Akito + K9	Linn LP12 Akito + K9
<b>AMP</b>	Cyrus 1	Cyrus 2	Cyrus 2+PSX
<b>SPEAKERS</b>	Mission 761 £439	Cyrus 781 £1,010	Cyrus 782 £1,640

### Where to find us



**At Last! The New Cyrus Tuner. A host of Facilities**

# HARROW AUDIO

27 Springfield Rd., Harrow, Middlesex  
Telephone: 01-863 0938

**NOW OPEN MON - SAT**

**TOP TAPE**

**EDA** British Audio Dealers Association

Mission • Musical Fidelity • Nagaoka

Nakamichi • Ortofon • QED • Quad • Revox • Rotel • Sennheiser • SME • Spendor • Spica • Stax • Tannoy • Target • Wharfedale • Yamaha

B & W • Beyer • Creak • Cyrus • Denon • Dual • Epos • Gale • Goldring • Heybrook • Jeklin • Kenwood • Koss • Linn • Marantz • Michell

# DON'T MISS NEXT MONTH'S ISSUE OF HI-FI CHOICE PACKED WITH IN-DEPTH REVIEWS!



## 30 LOUDSPEAKERS ON TEST

Including the latest from Celestion, Mordaunt-Short, Rogers, Tannoy and many others.

Our Market Survey investigates the dealers' views on the current state of the Loudspeaker market  
**PLUS...**

Personal stereos come under our scrutiny  
**AND**

ASPIRATIONS VISITS THE HOME OF SNOOKER ACE STEVE DAVIS

**PLUS...**

NEWS, VIEWS, AND MUCH, MUCH MORE.

# HI-FI CHOICE

JANUARY ISSUE ON SALE DECEMBER 8th





## CHOICE SESSIONS

*Things we hear . . . This month, Ariston's stylish CD player gets a spin; living in audio bliss with the Rock Reference turntable; Sanyo's last word in portable blasters.*



consequently was becoming an uneconomic proposition to continue manufacturing. The cheaper *Avalon* was easier to build – and dozens could have been shipped out of the factory door if consumer demand was high enough – but in the world of hi-fi it's now a fact of life that most of you are looking to buy a CD player, not a record player. Most of you, that is, except for the few who already have good systems and are looking for something that will really blow your socks off.

So Max Townshend, seeing the writing on the wall, has decided to concentrate on building products for enthusiasts who are looking for *the best* – without, that is, getting into the truly esoteric area of £15,000-plus systems which are nice to dream about, but largely unaffordable.

Sure, people will always need turntables, but as we progress deeper and deeper in to the digital age, the future, as Max Townshend sees it for his small company, lies with those of you who own extensive record collections and want to hear them in all their glory. The manufacturing of turntables (even turntables of high quality) for consumers who simply want something "to play a few records on", is best left to those firms who can keep prices competitive thanks to the economy of reasonably large scale automated production.

The funny thing is, having made such a bold step Townshend International is now flooded with orders for the *Rock Reference*. It's taken *Choice* many weeks to procure a sample for assessment simply because the firm is having a bit of a tough time trying to cope with demand. To make matters more complicated, Townshend International was

### KEEP ON ROCKIN'

*John Bamford listens to the Rock Reference turntable, made by specialist firm Townshend International, and reports on what's happening within the company.*

How can I put this? Well, there's some good news and there's some bad news . . .

Earlier this year, Townshend International, manufacturer of the *Rock* turntable and *Glastonbury* loudspeakers, announced a new 'mega-deck' for vinyl record enthusiasts called the *Rock Reference*. (This is the good news, by the way.) It is, if you like, designer Max Townshend's ultimate statement on the philosophy of how the old-fashioned gramophone record should be transcribed for accurate replay quality – "and never mind how much it costs to manufacture the blessed thing . . ."

I'll come back to the *Reference* in a minute. It's best to get the sadder news out of the way quickly. In short, the £1,800 *Rock Reference* is now the *only* turntable Townshend manufactures. Sorry folks, but the company's £450 *Rock* and £299 *Avalon* record players ceased production three months or so ago, and no more are being made.

I have deduced that the reason behind this sudden turnabout, is all to do with the economy of scale. Townshend is one of Britain's

'cottage industry' specialist manufacturers, with a small factory/workshop, a handful of keen staff, and the necessary tools to convert small bits of metal into record players. The £450 *Rock*, which has been on the market for a few years now, is (was) a hand-built item which took many man hours to construct and



*Rock Reference: designed for audiophiles who want nothing but the truth.*

planning to appoint a UK distributor for its products and move from leafy Walton-on-Thames, Surrey, to Houston, Texas – but a family bereavement has changed those plans for the time being.

So getting back to the subject – the *Reference* – this turntable is clearly causing much excitement in hi-fi circles. Either you've been checking it out at one of Townshend's small number of enthusiastic dealers, maybe having seen one of the magazine reports which came out in print a few weeks after the deck was launched, or you've been wowed by the beast when visiting a hi-fi exhibition. Whatever, demand is outstripping supply, and yours truly has had to wait patiently before taking delivery of a sample to try at home. I believe I now know what all the fuss is about.

This turntable has been keeping me awake at nights. It's causing a major reassessment of what's hidden in the grooves of countless LPs buried in my not insubstantial record collection, simply because it gets more out of those grooves than any other transcription device I've ever encountered. Its dynamic range is breathtaking, its resolution of fine detail captivating, and its sense of 'power' and security – especially its compact disc-like authority in the bass – totally enthralling. Having enjoyed its performance in numerous system combinations at home during the last month or so, there's clearly no way I'm going to be able to live without its unequalled precision and neutrality.

We'll have more on this astonishing record player in two month's time, when we'll have put it through a full measurement programme and spent many more hours listening to records and comparing them to master tapes. In the meantime don't take my word, or anybody's word, for it. Seek out a demonstration at your nearest stockist. At this price – £1,800, plus £650 for the latest-version *Excalibur* arm to go with it – a home demonstration (perhaps over a weekend) shouldn't be too difficult to arrange with a dealer. My only warning is this: by Monday morning you'll probably have decided you can't possibly 'make do' with anything else. Once appreciated, the focus and stability of the soundstage, combined with brilliant bass 'slam', is totally addictive. And for any addict, the frustration of being at the end of a waiting list, a list which is growing daily, is not something to relish.

### HIGHLAND SPIN

*The first Scottish CD player has been made by Ariston and it's a slick looking beast... well, that's what JK thinks...*

You may wonder, as I did, why Ariston should want to submit its latest creation, a CD player, to a reviewer such as myself – a self confessed analogueophile and part-time member of 'the anti-digital front.' However, upon its arrival in the *Choice* office all became clear. I had been selected as a fan of good aesthetic design, an area in which this new Scottish player clearly excels. The black acrylic face plate is a triumph of minimalist design, even managing to compete with the sexier European designs for cleanliness of line.

Its most attractive element is the way that the front of the disc tray sits flush with the machine's fascia, creating the impression of



*Ariston's stylish CD player: elegance is the key.*

a lozenge of acrylic having been cut out with a jigsaw – an ambitious bit of styling that's well worth the effort. The rest is just as simple, a row of buttons, an on/off switch and some graphics. All the switches are quite nice, they feel and look appropriate to the player, but the graphics are comparatively basic. It's a pity that the 'compact disc digital audio' logo had to be there at all. However, coming back to this piece soon after the Penta hi-fi show, the graphics begin to make more sense. At the show Ariston had the complete system stacked up with all the logos in a neat line, revealing a consistency and simplicity of design that is uncommon in British audio.

But does all this elegance help or hinder the Ariston owner when it comes to playing discs? In practice it helps a great deal. The basic line-up of transport controls means that the machine can be treated as a straightforward ergonomic machine, or by using the relatively complex display and remote control, as a multi function programmable player. If the display could be switched out it would further improve aesthetics and current thinking would indicate that sound quality would also benefit.

Apart from the Perspex fascia the rest of the player's casework is exceptionally rugged compared to Far Eastern machines. Two fairly heavy gauge steel pressings are used and the player sits on four solid rubber feet. The rear panel sports recessed phono sockets outputting digital and analogue signals and a two-pin mains socket – the sort that offers enthusiasts the chance to experiment with mains polarity and its sonic effects. Unfortunately I didn't remember to investigate this when I was listening to a few albums from my meagre silver disc collection through the usual Audio Innovations and Snell system...

As listening to CDs isn't something that I do out of choice there's a risk in this situation of merely criticising the faults of the medium, so a Marantz *CD65/ISE* was brought

in as a benchmark. With an open mind I stuck a disc in the tray, which incidentally is the same as in the Marantz, and pressed play. The drawer closed with a rather insubstantial clunk, the disc drive whirred into action and, shiver-me-timbers, soemthing sonic burst forth from the Snell loudspeakers. It was in fact something from the *The Bad Mixes* disc currently being circulated, in a low key fashion by Monster cable's UK distributors Zenonlec, and is basically the singles from wacko Jacko's album of a similar name, re-mixed using Monster interconnections in the studio.

The first reaction was a desire to jack up the volume. That done, pen was put to paper and notes made. First impressions were of a slight low frequency emphasis that encouraged bass rhythms and gave the sound a toe tapping quality. This effect appeared on other discs apart from this particularly beat oriented creation. The next disc played was Flim and the BBs – *Further Adventures*. This didn't exactly hit the spot, sounding rather bland and dynamically compressed – hardly the audiophile disc that it's billed as. But the Opus 3 'Dynamics' disc sounded relatively natural, proving that the quality of recording wasn't being entirely obscured.

I listened to several other albums and came to the conclusion that the Ariston sounds rather two-dimensional and lacking in dynamic range, the midrange sometimes disappearing into the soundstage at low levels. It's not too aggressive and works better at high-ish levels. It also makes a bid for musicality by emphasising beats, but compared with the stiff competition on hand I couldn't help feeling that it lacked depth and dynamics.

Undoubtedly, the player is an elegant and well-built machine but compared to the *65/ISE* its sonic capabilities don't really measure up to its £345 price tag. However, the Marantz is our reference player at £300 and it's no longer in production so perhaps the Ariston shouldn't be so closely compared.



1990

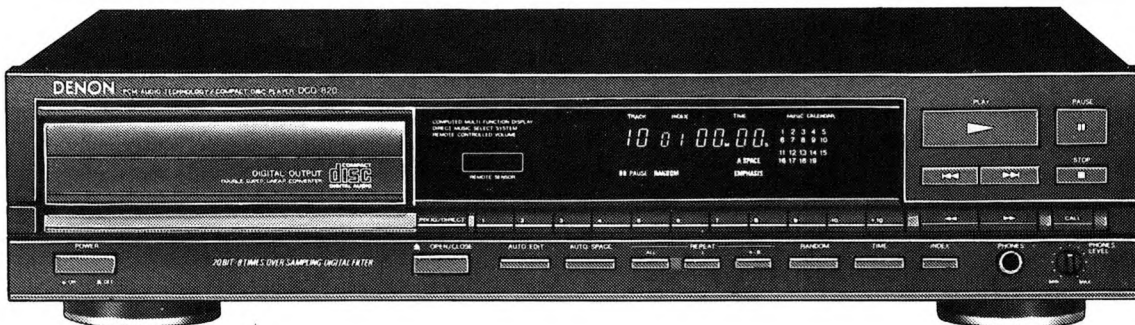
# THE 'TWENTY' SERIES CD PLAYERS 2 YEAR GUARANTEE



## DCD 920

£299.95

· Twin 20 bit DACs · 20 bit Digital Filters · 8 × Oversampling · Twin Power Supplies · Motorised Remote Volume · Co-ax & Optical Digital Output · Direct Track Selection · 20 Programs · Auto Edit · Index Search ·



## DCD 820

£249.95

· Twin 16 bit DACs · 20 bit Digital Filters · 8 × Oversampling · Twin Power Supplies · Remote Volume · Co-ax Digital Output · Direct Track Selection · 20 Programs · Auto Edit · Index Search · Headphone Volume Control ·

The new 'Twenty' series CD players from Denon, feature the 20 bit "Delta technology" pioneered in our high end 3520/1520 models. The key audible benefit of this advanced circuitry is the improved resolution of low level detail and ambience. All of a sudden recordings sound more real, this is multi-bit technology that works! The DCD820 and DCD920 are both outstanding CD players that offer terrific sound quality and a selection of useful features, only you can decide whether to spend that extra £50. Your Denon dealer will help you make the choice.

For full product information write to: Hayden Laboratories Ltd, FREEPOST, Chalfont St Peter, Bucks SL9 9BS

# DENON

D E S I G N I N T E G R I T Y

And who knows what wonders an outboard DAC might be able to extract from its digital output?

It's worth noting, however, that in a less revealing hi fi system its shortcomings will be less noticeable and, if its styling appeals, you could certainly do a lot worse for the money.

## BASS CULTURE

*JK pumps up the volume with Sanyo's ghetto blaster-eating MCD950F, possibly the final word in street sounds.*

Back in June, when we were rounding up a bunch of yuppie blasters, one of the models which caught our eye in foreign magazines was the Sanyo MCD950F. However, at the time it hadn't landed on these shores so we decided to get to the top of the list for a review when it did arrive. And some three months later what should appear in our offices but the biggest ghetto blaster box we'd ever clapped eyes on.

The 950F is a veritable tank of a blaster, making the Philips *Beast* look positively friendly. Its sheer mass alone gives it a physical presence that's enough to impress even the most icy of homeboys, but its design is what really sets it apart. This gives you a pretty good idea of what I could rant on about for several paragraphs, but it doesn't reveal the scale and complexity of the curved mouldings which give the machine its Blade Runner or Batmanesque appearance – in fact Bat Blaster would be a very suitable name for the 950F (a new marketing angle, maybe?)

However, there's more to it than looks alone – it isn't too short on features either. The word here is 'twin': twin cassette decks are pretty much the norm – but twin CD players? Now that's what I call muzak! Is there any point, you might ask . . . well, yes, including the obvious one of impressing your mates. If there are two discs onboard it will auto-

matically play one then the other, and in the same vein it's possible to program a sequence of tracks from both discs. Tracks from different discs hardly mix into one another – there's a good few seconds of whirring as the other disc starts up – but it does mean you can have up to a couple of hours' continuous sounds depending on the length of the discs. The never dull display shows the number of tracks on each disc in a calendar style layout that can cope with up to 13 tracks – any more and it indicates 'over'.

The remote control has a keypad for direct track access and also allows basic programming of track order. The remote is remarkably complex for a beatbox, and also features transport controls for both cassette decks, source select, volume control and mute. It would be possible to spend a whole review describing the features on this king of blasters, and after all that's what this machine's all about, so I'll run through them from top to bottom. The first is a non-feature – there isn't a conventional handle on the 950, just grips at either end. Instead there's a bass accelerator! Easily the most novel device onboard, this three position twist grip presumably allows more or less air to pass along the pipe connecting the two top mounted woofers, the maximum position creating copious amounts of the low-ish stuff – guaranteed to impress your mates. What next? Ah yes, a pair of tape decks, autoreverse ones at that, with electronic transport controls which can't be bad. Rolling round the tape compartments we get to the display, which is well filled with the likes of continuously operating level meters, a clock, the name of the source in use and a whole host of CD related bits'n'pieces. Oh and there's a volume level indicator, which has its uses too. Next to that sits the relatively basic FM/AM tuner, which however does sport some red LEDs and a mono lever.

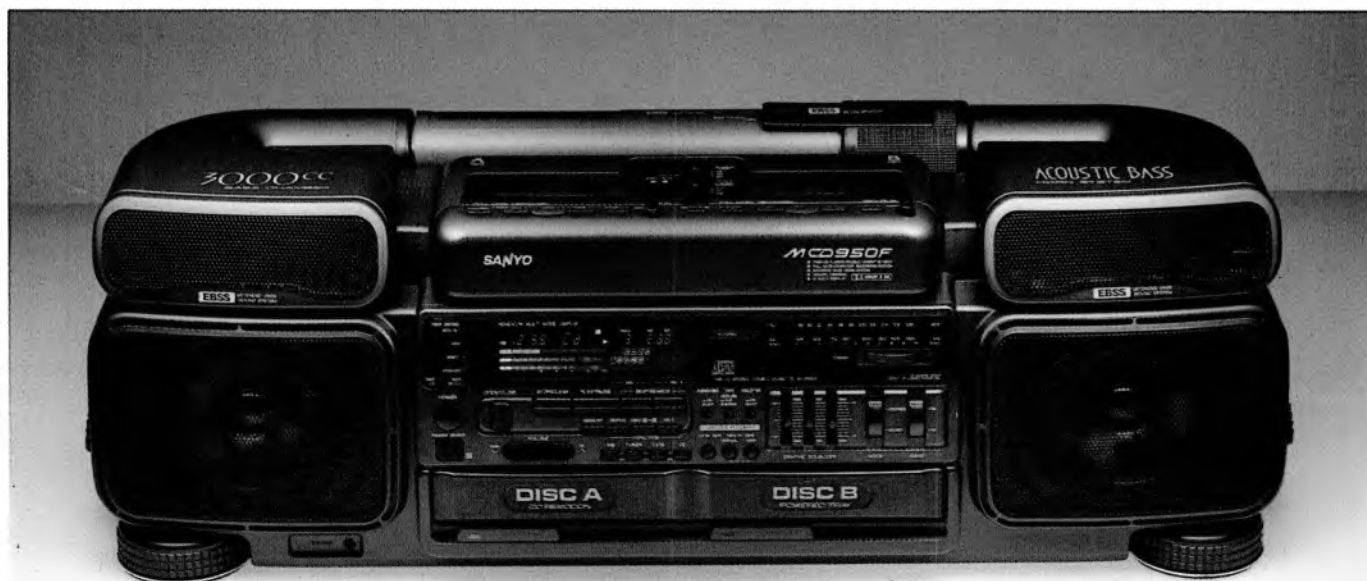
The next panel down is a button pusher's delight, with controls for everything but the tape decks, and a rather unappealing volume

rocker switch which is much slower to operate than a conventional rotary knob – presumably it's cheaper than the motorised knobs used on other remote controllable blasters. At the bottom of the machine is the rather filmsy CD tray, a large plastic device that accepts two discs of either three or five inch diameter. There are even LEDs to show which disc is playing.

That just about covers it, though there are the usual sockets and switches on the back, a fairly hefty aerial, four speakers including unusually faceted mid/high frequency drivers and a sticker proclaiming 100W (P.M.P.O.) which translates into hi-fi speak as hogwash, or, to put it more politely, fully clipped output. Either way it goes loud and fairly low, say 60Hz or thereabouts, easily outdoing all but the Bose model in our last yuppie blaster test group; which given its none too lightweight price tag (£599) is what one would expect. On the fidelity front it's in the same low-fi category as its kin, but like them its purpose is the pumping out of beats, a task it takes to like a fish to water. Don't expect finesse or good low level resolution, expect bass acceleration of 0 to 60Hz at the speed of sound! And expect to get some exercise in the process – at 10kg dry you ain't gonna stroll far.

Whether the available sound quality is good enough to warrant the 950's high price is a moot point. What this machine is about is gadgets: lights, graphic equalisers, bass accelerators and something called *bass-surround*, a rather basic sound dispersal system that reduces definition to an all time low. There's no shortage of automation either, the abundance of electronic controls allowing 'computer recording' from disc and tape and a remarkably comprehensive remote control.

If you need the ultimate beatbox then look no further. No doubt there will be a bigger one out next year, but until then you'll be the king of the street.



Sanyo MCD950F: throttling bass at the flick of a wrist!

# COVENT GARDEN RECORDS

AT

# 84

CHARING CROSS ROAD  
LONDON WC2H 0JA

Tel: 01-379 7635/7427

Fax: 01-836 1345

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

Proudly Presents

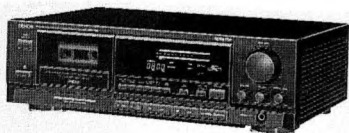
## THE 1989-90 RANGE OF DENON CASSETTE PLAYERS

DENON DRM 34HR £319.00



- 3 HEAD
- 3 MOTOR
- TWIN CAPSTAN
- INFRA RED REMOTE CONTROL

DENON DRM 800 £299.00



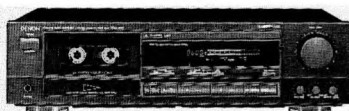
- 3 HEAD
- 3 MOTOR
- HX PRO
- DOLBY B/C
- CD DIRECT
- REAL TIME DIGITAL COUNTER  
(Recommended Hi-Fi Choice 1989)

DENON DRM 700 £239.00



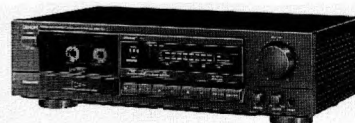
- 3 HEADS
- HX PRO
- DOLBY B/C
- NON-SLIP REEL DRIVE
- REAL TIME DIGITAL COUNTER

DENON DRM 600 £199.00



- HX PRO
- DOLBY B/C
- REAL TIME DIGITAL COUNTER
- FULL LOGIC
- AMORPHOUS SF HEADS

DENON DRM 500 £169.00



- DOLBY B/C
- HX PRO
- 2 MOTOR TRANSPORT
- MPX FILTER
- TWIN POWER SUPPLIES  
(Best Buy Hi-Fi Choice 1989)

Now available in stock and on demonstration at Covent Garden Records, we believe that Denon has truly excelled with their new range and as such we are confident in offering our customers a 7 day trial free of charge on any of the above units. All units carry a 2 year, full parts and labour guarantee from Covent Garden Records and Denon. Please ask for details from TREVOR, ROBERT, NICK or JULIAN.



1000

# NEW THREE HEAD CASSETTE DECKS

## 2 YEAR GUARANTEE



### DRM 800

### £299.95

· Three Heads · Three Motor transport · Twin Capstan · Amorphous heads · HX Pro · Dolby B/C · Full logic Silent Mechanism · Rec Return · C.D Direct Input · Ceramic Cassette Stabilizer · Non-slip reel drive · Fine Bias · 50db meter range · Reel time Digital Counter · IS Remote System ·



### DRM 700

### £239.95

Three Heads · Three Motor transport · HX Pro · Dolby B/C · Full logic Silent Mechanism · Non-slip reel drive · Rec Return · 50db meter range · Reel time Digital Counter · Fine Bias · IS Remote System ·

With these two new models, Denon once again demonstrate their mastery of the cassette medium. The DRM 700 offers outstanding value for a three head deck and is no mean performer in its own right, the DRM 800 with its amorphous heads and twin capstan transport, goes on to squeeze that extra 'nth' degree of performance from every cassette. The only way to choose between them is to go and see your Denon dealer and take some of your favourite music with you.

For full product information write to: Hayden Laboratories Ltd, FREEPOST, Chalfont St Peter, Bucks SL9 9BS

# DENON

D E S I G N I N T E G R I T Y



## ASPIRATIONS

*This month we're back to visiting a purist audiophile whose Voyd record deck, 'Manhattan Skyline' amplifiers and Snell loudspeakers are regarded as one of the finest available combinations.*

# A Voyd Filled With Sound



*Father and daughter at table with the Roberts radio.*



**H**i-fi buffs fall into several different camps according to the type of sound they prefer. There are those who swear by a Linn/Naim combination; many aspire to the Krell/Apogee type line-ups offered by Absolute Sounds and there are other more diverse set-ups which each have their proponents. Where matching components by different manufacturers is concerned synergy has become something of an art form; the sonic characteristics of everything, from loudspeaker stands or interconnect cable to the source, amplifiers and loudspeakers warranting scru-



tiny to get the right balance.

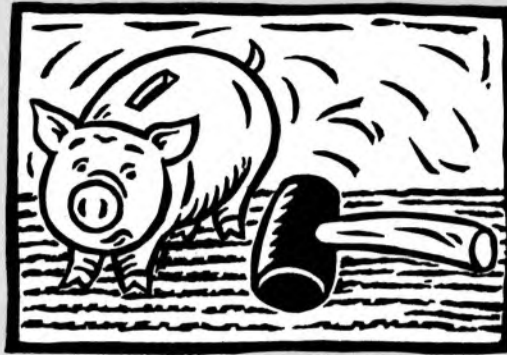
One of these synergistic syntheses is the Audio by Design system. It consists of the Voyd turntable made in Cheltenham, Audio Innovations valve amplifiers made in Brighton and Snell loudspeakers made in Boston, Massachusetts. Audio by Design is the distributing company and also manufactures the amplifiers – nicknamed 'Manhattan Skyline' for their open array of valves which give a little horizon of lights in a darkened room. Harry Manfield, whose home we are visiting this month is a convert to this system, and sees it (at the

moment) as the culmination of 15 years as an 'audiophile'.

A graphic designer by profession, 30-year-old Harry lives with his wife and daughter in a spacious detached house overlooking the Wey valley near Guildford. Their home used to belong to a musician who apparently had two of the downstairs rooms soundproofed to be able to play his instruments in an acoustically dead atmosphere. Such rooms are also useful for audio equipment and now one houses the television, the other the hi-fi equipment – leaving the main living-room refreshingly free

*The listening room with its full Audio By Design line-up: Pure stuff.*





## At last, a British hi-fi system that's not just gentle on your ears

*Traditionally, if you wanted to turn your bank manager's hair white in an instant, the ideal way was to whisper "top-notch British hi-fi" in his ear. Here at Arcam Towers, however, we've never been great traditionalists. Our original Alpha amp and tuner proved conclusively that pawning the family jewels was no longer a prerequisite for buying great British equipment.*

*The Alpha won What Hi-Fi?'s Best Budget Amplifier of 1989 award (and we've even improved it since then...New Hi-Fi Sound calls it "a bargain", Hi-Fi Choice gave it their coveted "Best Buy" rating).*

*Now the ground-breaking amp and tuner are joined by an Alpha CD player and Alpha speakers, to give a complete British system that even the meanest bank manager will like the sound of.*

*The Alpha CD incorporates several features normally associated only with much more expensive machines...such as twin power transformers to minimise sound-degrading internal interference.*

*There's 20 track programming and an optional remote control. Our boffins reckon its sound quality is unbeatable in its price range. (And they should know, having designed and built the Black Box digital to analogue converter that won unanimous acclaim from every reviewer and awards panel.)*

*The brand new Alpha speakers are the ideal units to complete the chain. Perfectly matched with the Alpha amp's output, these good-looking speakers are two-way infinite baffle units (so you can put them close to a wall). And, like all Arcam products, their phenomenally robust construction guarantees the listener years of fatigue-free aural excitement.*

*The whole Alpha system (CD, tuner, amp and speakers) will give you plenty of change from £1,000. Enough, for example, to equip it throughout with AudioQuest cables to extract that last ounce of performance. Naturally, though, the individual components are all available separately should you wish to acquire them piece by piece. However you choose to buy your Alpha system, you'll find that, to the immense relief of our porcelain friend, buying British doesn't have to be a shattering experience.*



AMPLIFIER · TUNER · COMPACT DISC · LOUDSPEAKERS

Please send me more information on (please tick box): The Alpha System  AudioQuest cable

HFC/12/89

Name: \_\_\_\_\_ Address: \_\_\_\_\_ HER

(PLEASE PRINT)

POST YOUR COMPLETED COUPON TO: A&R CAMBRIDGE LIMITED, DENNY INDUSTRIAL CENTRE, WATERBEACH, CAMBRIDGE CB5 9PB. OR TELEPHONE: (0223) 861550

of electronic gadgetry.

Classical and modern art prints display a wide ranging taste and the sharp-eyed will notice a Roberts radio proudly on display on the dining-table. The superb wooden-cheeked old timer (the company is still going strong after nearly 60 years) was bought recently and performs the function of a tuner in this household.

Harry's listening room contains the minimum of furniture (just a sofa and armchair) which faces the system and picture window with a view of the top few feet of his garden's acreage. One notices two framed Audio Innovations posters, one hanging next to his listening position, the other above his record collection – housed just outside the room. He's a very serious convert to the valve sound!

The hi-fi is the full Audio by Design line-up. The two sources are a Voyd record deck and Marantz SD45 cassette deck ("It's fine for making tapes for the car."). As is often the case with the audiophiles we visit, there is no CD player and our host doesn't believe the digital medium can properly recreate a musical experience. "I have auditioned CD players," he said, "I've even listened to a couple of top of the range models here. But I don't think they come close to a good analogue front-end. There is no competition; CD has many undoubted qualities but reproducing music isn't one of them." The same philosophy applies to his record collection: "I'm disenchanted with new music – it's all rubbish. I can't get on with synthesized sound – give me real instruments – there is no human element in new music. When you play a trumpet or a proper pair of drums it's very different to a synthesizer which is just soul-less in comparison," he says.

And this is the reason half his collection is classical music and half 60s' and 70s' jazz, rock and folk (Leonard Cohen). There is the usual spattering of audiophile discs as well: we listened to an Opus 3 Tomas Ornberg record (*The Blue Five 1982*) and several other pieces recorded with hi-fi systems in mind. "The trouble with this system is that if the record has been badly produced then it really shows it up. On the other hand if you get a well-made track then it pays dividends because you start to hear everything in the music."

The Audio by Design philosophy is to recreate the artist's music faithfully by extracting and reproducing all the information available from the record. The idea is to bring musical reality into your living-room rather than producing a coloured or what is commonly known as a 'hi-fi sound'. Bass and treble are therefore natural rather than obvious – there isn't a tone control because the company is confident that you're getting what the artist intended, and if you hooked a graphic equaliser into the system you'd start people spitting with horror.

The contents of Harry's vinyl starts its journey to the Snell loudspeakers through



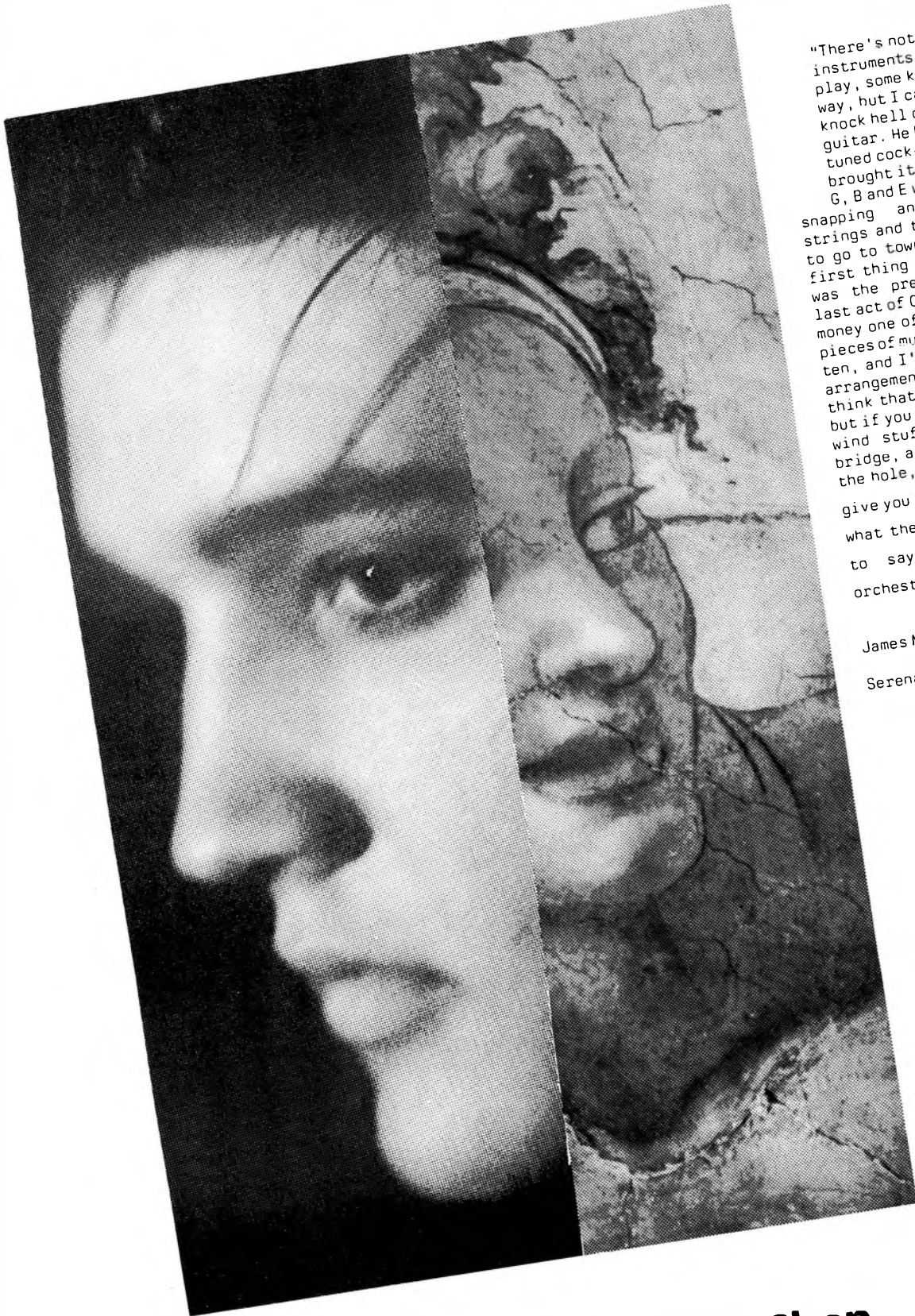
*With their limited visual appeal the Snells are an obvious winner sonically (above). Annabelle agrees (below).*



an Audionote IO cartridge. Japanese production of this cartridge has just ceased but Peter Qvortrup, who runs Audio by Design, recently went East to learn how it was made and now plans to manufacture the IO in the UK. He'll also be making the IO Limited – an electromagnetic cartridge which is as rare as hens' teeth (it needs its own power supply and therefore special arm cabling with six wires instead of the usual four) – with a modified power supply. The first British made models should be available in December.

The next stage is a silver-wired Helius Aureus arm (sent out with the Voyd deck although a new Audio Innovations arm is imminent) and the Voyd deck itself where

three motors and an acrylic platter give the advantage of high inertia without the manual energy storage problems of high mass designs. The moving coil cartridge also uses a step-up transformer to boost its low output for the preamplifier. The Voyd uses a split phase power supply with electronic speed changing and is supported on a Skyline three legged table. Three Audio Innovations amplifiers are stacked in a Target table next to the Voyd. The Series 1000 preamplifier is on top and is usually hooked to the (better sounding) First Audio triode power amp with some Audionote Copper cable. At the bottom is a party-ready Series 800 power amplifier used when volume rather than absolute



"There's not many instruments I can't play, some kind of way, but I can really knock hell out of a guitar. He had it tuned cock-eyed, but I brought it to E, A, D, G, B and E without snapping any of his strings and then I began to go to town on it. The first thing I played her was the prelude to the last act of Carmen. For my money one of the greatest pieces of music ever written, and I'd once made an arrangement of it. You may think that's impossible, but if you play that woodwind stuff up near the bridge, and the rest over the hole, the guitar will give you almost as much of what the music is trying to say as the whole orchestra will...."

James M. Cain

Serenade

## The Cornflake Shop

37 WINDMILL ST. LONDON W1P 1HH  
01 631 0472



excellence of reproduction is required according to our host.

The only non-Audio by Design product is some Monitor PC *Silver Line* multi-strand loudspeaker cable running to the Snell *Type E*s on their Pirate *E* stands.

These last items are very heavy, the columns being filled with sand and lead shot, and promise better loudspeaker performance through their immense rigidity, but Harry needs a friend to help him lift them!

The system was bought at Audio South, of Farnham, but our host installed everything himself. "There's no problem with setting up the record deck in its playing situation, they do it all at the shop and put the transit bolts in, though they would have set it up if I'd wanted."

Harry admits that he "became hooked on hi-fi at school". That makes it sound like this stuff is imported from Colombia and indeed the odd wearisome sigh from his wife Alison confirms that it would be hard to kick the habit now. "I prefer the Roberts radio," she said, "listening to you talking about that equipment loses me."

Listening sessions are punctuated by the occasional appearance of Harry's daughter Annabelle – this is her dance room and she even dances here when the



The simple lines of this turntable (above) belie its performance characteristics. The lowest of these gorgeously-designed amps (below) is only used at parties.



system is switched off. The realism is immediately confirmed with a US import of *Bop City* by Ben Sidran (1983 Antilles/Island). "The rest of the system is about a year old but the deck is new," Harry said, "it's very fast; it just starts and stops; there's no slurring." The same goes for the speakers, which are very sensitive to the *First Audio*'s 7½watt output – the result is a feeling that you're listening to a longer piece of music. The wide dynamic range also means that the system sounds louder than it actually is – you can quite easily talk over it – and the room fills with sound which doesn't take over the rest of the house. Try comparing that with a hi-fi show where systems are wick'd up to 90dB with the salesman mistakenly proclaiming: "this goes really loud!" And as far as the drug analogy goes the sound from this system is very pure.

### THE SYSTEM

Audionote <i>IO</i>	£895
Helius <i>Aureus</i> Arm	£335
Voyd Turntable (split phase psu)	£1319
Audio Innovations <i>Series 1000</i> Pre	£1229
Audio Innovations <i>First Audio</i> Amp	£1149
Audio Innovations <i>Series 800</i> Amplifier	£849
Snell <i>Type E</i> Loudspeakers	£1095
Pirate <i>E</i> Stands	£219
Marantz <i>SD45 (II)</i>	£200
Monitor PC <i>Silverline</i>	£5.75/m
Audionote <i>Copper</i>	£35/m
Audionote <i>Flexible Silver</i>	£85/m
Target Table	From £46

System sold by: Audio South, 5 Mead Lane, Farnham, Surrey. Tel: (0252) 714555.



## PERSPECTIVES

*Confused by digital jargon? With so much discussion in hi-fi circles centring on the various forms of digital processing employed in current and future CD players, we asked Paul Miller to explain, as simply as possible, the differences between multi-bit and bitstream digital-to-analogue conversion.*

Six months ago *Hi-Fi Choice* carried the first article outlining the theory and practice behind Philips' new bitstream D/A conversion technique. Since then the prototype *TA-F630ESD* amplifier from Sony – the first to be equipped with Philips' 1-bit converter – has gone on to full production while other PDM (Pulse Depth Modulation) systems have been demonstrated by Rotel, Deltec and of course Philips.

Many other specialist companies, including Arcam, are also experimenting with the system. The fruits of their labours are likely to be seen some time in the new year, some two or three months after Philips' 'official' launch for PDM in February 1990.

In the Far East Technics has bitten the bullet and leapt wholeheartedly in favour of its PWM (Pulse Width Modulation) D/A converter, a cousin of the PDM system. Other manufacturers now using PWM technology in their CD players include JVC, NAD, Harman/Kardon, Sansui, Sony and Teac – indicating that perhaps the race for ever more 'bits' could be cooling off somewhat. Who knows, before long 1-bit players could be all the rage!

Those readers not daunted by the complexities of state-of-the-art digital technology might care to refer to our original PDM article published in June '89, which was meant as a definitive, no-holds barred technical feature to help launch the format; by contrast this article is aimed at the

wave over a very short period of time. With a standard sampling rate of 44.1kHz, this leads to one sample (or snapshot) per 22.7 millionths of a second. It's important to appreciate that as long as the sample rate is more than twice the maximum sampled frequency (ie 20kHz) there will be absolutely no loss of information.

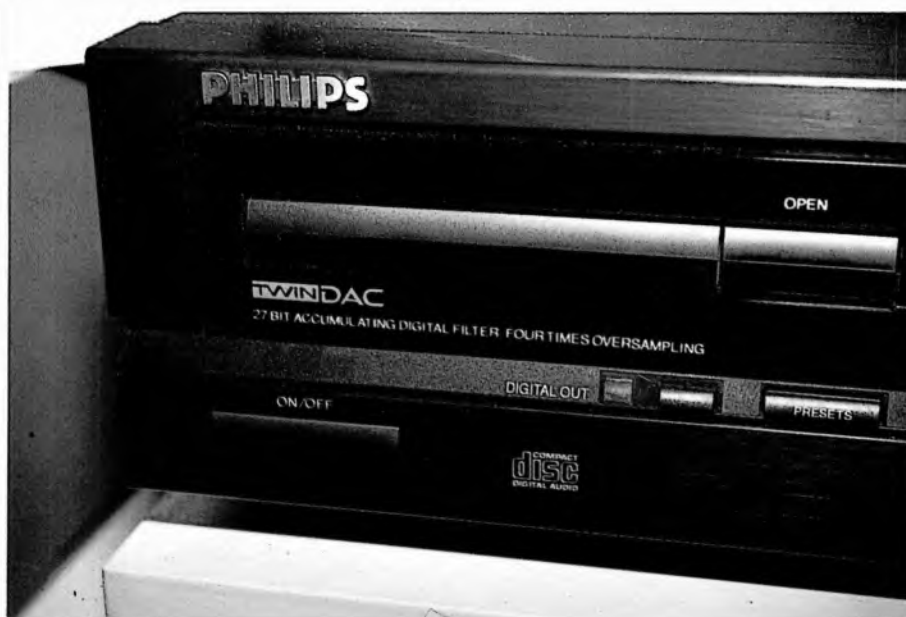
Anyone who tells you that the CD sampling rate is too low and therefore loses subtle musical detail (below 20kHz) is clearly misinformed. Rather it's during the subsequent quantisation process, where the level of the signal is allocated one of the 65536 binary numbers, that losses (or modification) of information will occur.

The smallest 16-bit binary number (called a 16-bit 'word') is represented by 16 0s or 0000000000000000 and refers to the maximum negative-going point of the audio waveform. Conversely the largest 16-bit word is given by 1111111111111111, representing the maximum positive-going point of the audio waveform. This would lead to zero net output between the 32768th and 32769th levels so in practice all the 65536 quantisation levels are treated as positive, some being more positive than others. Between these two limits there are 65534 other permutations of 1s and 0s available to describe any intermediate sample point.

Having seen how a music signal can be stored as a series of 16-bit binary words, let's now look at the reverse situation – digital-to-analogue conversion. A convenient way of describing a 16-bit D/A converter is to imagine it containing 16 separate current sources, each responding to a particular position in the 16-bit word.

So, every 22.7 millionths of a second a new 16-bit word is addressed to the DAC and the 1s and 0s 'line up' above the row of 16 current sources. Reading from right to left, if the 16-bit word happens to be, say, 0000011000101111 then the first four current sources will turn on, as will the 6th, 10th and 11th current sources. Responding to the binary '0' the remaining current sources will remain off for the duration of this particular sample. Each of these currents is added to yield the original level of the audio waveform the moment it was sampled.

Now, these 16 current sources are not all the same size. In fact they double in output, or significance, with each step from the right to the left. So source number '2' is twice the size of source number '1' while source '3' is double source '2', and so



One  
bit at  
a time

more technically nervous reader.

### 16-BIT CONVERSION

Perhaps the best way to get to grips with a bitstream converter is to first appreciate the operation, and drawbacks, of a conventional 16-bit D/A converter. In the latter system the original music waveform is described in a binary code, that is a series of '1's and '0's where a '1' represents an 'on' state and a '0' an 'off' state. Because a 16-bit code is employed this releases a total of  $2^{16}$  different binary numbers to define the audio waveform at any particular point in time.

In reality this means we have 65536 successive voltage or quantisation levels available to pin-point the position of the audio wave per sample. A sample is like a frame of film, a precise snapshot of the audio

on. This means that the 16th source (on the far left) has to be exactly 32768 times larger than the source on the far right! Understanding this concept begins to shed some light on the incredible tolerances involved in the manufacture of a 16-bit DAC!

This largest current source responds to the Most Significant Bit (MSB) on the far left of the 16-bit queue while the Least Significant Bit (LSB) is handled by the smallest source on the far right. An LSB represents the smallest increment or step available to the DAC, so there are effectively 65536 LSBs strewn between the lowest and highest 16-bit word. For example the difference between 0000000000000000 and 0000000000000001 is one LSB as is the difference between 0000111111111111 and 0001000000000000.

Clearly all these LSBs have to be the same size. If they're not the composite output of all the sources per sample will deviate from the original quantised value. The 'steps' therefore become irregular, resulting in what is called non-monotonic conversion – a distortion of the music waveform that is peculiar to such a digital system. An analogue record player or tape deck, for example, cannot produce this type of distortion.

Non-monotonic conversion is a fact of life for all multi-bit DACs because the characteristics of the 16 current sources will vary both with time (ageing) and temperature. It is most destructive at low signal levels because here there are fewer of the 65536 binary numbers available to describe its precise position, or level, per sample.

Another drawback that must be faced by all multi-bit converters is the problem of glitches. Glitches are similar to a ringing or overshoot at the beginning of each new sample and are caused by certain of the 16 different current sources turning on or off faster than the remaining sources. After all it seems a trifle unreasonable to expect the MSB current source to react just as quickly as the LSB current source, the former being 32768x the size of the latter!

These glitches are removed after D/A conversion using what is known as a 'sample-and-hold' filter. This circuit 'samples' the step output of the DAC in between two successive glitches and 'holds' (or maintains) this output through the next glitch. The stepped analogue output of the DAC is therefore shifted by one half of a sample period, missing out the glitches. Nice idea but the sample-and-hold filter has to operate with a faster clock accuracy than the DAC itself, thereby introducing a further set of compromises of its own!

The magnitude of the glitch depends very much on which current sources are operating during that sample, so the biggest glitch will occur when all 16 of the current sources change state (ie from 0 to 1 or vice-versa). This only happens once

across all 65536 binary levels and occurs at possibly the most sensitive position in the audio waveform. This is called the zero-cross point, the point at which the audio wave crosses from positive to negative or negative to positive.

Let's look at the 16-bit binary words that exist at the zero-cross point and examine the problem more closely. This is the 32768th level in a chain of 65536 levels, a position which is flanked by two binary words: 0111111111111111 and 1000000000000000. So at the zero-cross point all the 16 bits and their respective current sources change state, creating a very large shudder or glitch in the output of the DAC. Just as crossover distortion in a class B amplifier is audible so too is this zero-cross distortion likely to have subjective repercussions.

Furthermore the question of non-monotonic conversion also raises its head at the zero-cross point. Assuming the LSB change is in the 'more positive' direction, then at this point the 15 least significant current sources will switch off just as the single most significant source turns on. Therefore the output of the single MSB must equal the total output of all the pre-

the Philips bitstream converter the same 16-bit wide words are used but the first 15 LSBs are chopped off to leave a single MSB. This is known as truncation, the single MSB controlling a 1-bit DAC with either a binary 1 or a binary 0. So far so good, but we now require this single MSB to do the same job as the previous 16-bit word which it clearly cannot. Looking at it another way, we are asking just two binary numbers (0 and 1) to represent the same data as the previous 65536 binary numbers!

In truncating the 16-bit words to 1-bit words a massive quantisation error is generated. This huge error results in an equally huge amount of noise and distortion after D/A conversion, after all we are only left with 1-bit resolution. Technically this means a S/N ratio of 6.7dB and an increase in distortion of some 50 per cent, neither of which is particularly desirable.

Philips gets around this dilemma by first oversampling the 16-bit data 256 times. By synthesising an extra 255 16-bit words in between each original pair the sample period is effectively reduced by a factor of 256, or from 22.7 millionths of a second to 88.6 thousand millionths of a second. The



*Don't worry if you're confused. Even CD player manufacturers' marketing teams seem unable to decide how best to promote their latest machines. We spotted these two Philips players (left and above) side by side at the recent Berlin Audio Fair.*

ceding 15 bits (or sources) plus 1 LSB. Once again the tolerances demanded by accurate conversion in a multi-bit converter are truly monumental.

### 1-BIT

One way to avoid glitches, zero-cross distortion and ensure monotonic conversion is to employ a 1-bit converter. In this case there is only one current source of fixed size so it must switch on and off in a predictable and reliable fashion. However if 16-bit converters were required in the first place how can a single bit converter possibly achieve the same results?

This is where Philips' PDM and Technics' PWM converters enter the story. In

revised sampling frequency is now  $256 \times 44.1\text{kHz} = 11.2896\text{MHz}$ . Under these conditions the noise and distortion, generated by truncation from 16- to 1-bit words, is spread evenly over a much wider bandwidth. Consequently the actual amount of this noise left in the minute 20kHz audio band is reduced, though it is still far higher than it was before truncation.

The next step is pivotal to the operation of all bit-truncation systems, be they PDM or PWM, and is referred to as 'noise-shaping'. In this instance the 15 LSBs removed from each 16-bit word are not discarded but are employed to generate an error signal that is fed back to the next subsequent bit. This is a digital analogy of



**AKG**  
ACOUSTICS

PICTURE

~  
PERFECT

~  
SOUND



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

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

#### K145 S

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



#### K240 MONITOR

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

#### K280 PARABOLIC

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



the negative feedback used to linearise the performance of audio amplifiers, for instance.

However, noise-shaping does not reduce noise and distortion it simply weights it towards the top end of the 11.2896MHz spectrum by sharing the error between successive bits. The graph (A) clearly demonstrates how the noise and distortion, produced by truncation is concentrated at 11.2896MHz and then falls with decreasing frequency. The area under the straight line – (before noise shaping) and under the curve (after noise shaping) is therefore equal. By the time the audio band is reached the noise and distortion is as low as it was before the 15 LSBs were chopped off.

So, these 15 bits are used to remove the extra noise and distortion produced by truncating the 15 bits in the first place! This is a circular concept but one, thanks to digital trickery, that works very successfully in practice.

If we determine linearity by signal-to-noise ratio it is fair to say that the Philips PDM converter offers 16-bit performance with all the benefits of a monotonic 1-bit DAC. The DAC itself responds to the binary 1s and 0s by producing a series of fixed-height, fixed-width pulses that are positive and negative-going respectively. These pulses are known as +1 and -1, the average of each in any given period of time determining the absolute value of the analogue (music) voltage.

For instance, if in a given period there are two pulses going up and two going down then the net output is zero. Alternatively, if there are four +1 pulses at the same time as two -1 pulses then the average output exists at 50 per cent of the maximum positive swing. These analogue pulses emerge from the DAC at a very fast rate (11.29MHz) and vary in number per unit time – hence Pulse Density Modulation or PDM. Very small signal levels are therefore represented by slight differences in the density of +1 and -1 pulses and large signal levels by large differences in the quantity of +1/-1 pulses.

## BITSTREAM

So how does the term bitstream fit into all this and is it correct to call the Technics MASH converter '1-bit'? At present Philips has not laid copyright to the term 'bitstream' so, theoretically at least, it can be used to describe the output of any bit truncating quantiser – ie a stream of bits. Whether the actual converter uses a PDM or PWM topology is another matter altogether.

MASH itself stands for Multi-Stage Noise Shaping, the same process utilised by Philips in its PDM DAC. However, in Technics' case the 16-bit wide words are only truncated down to 3.5 bits, thereby generating slightly less of a quantisation error and so less noise and distortion than by truncating to a 1-bit datastream.

Because there is less noise to 'shift' Technics uses a less ambitious level of oversampling – 32 times to be precise. This then redistributes the quantisation noise and distortion over a narrower 1.4112MHz bandwidth.

However, because there's less 'room' to shape the noise Technics uses two-stages of noise-shaping, the 3rd-order curve rolling-off faster than the 2nd-order characteristic of Philips' noise-shaper. Ultimately the result is the same, using oversampling and noise shaping to retain 16-bit performance while actually using less than 16 bits to control the DAC. The Technics DAC adheres to the principle of Pulse Width Modulation, producing a series of fixed height but variable width pulses to describe the analogue waveform.

This is where the residual 3.5 bits come into the equation, being responsible for 11 binary numbers, each of which is responsible for a particular width pulse. The 11 ( $2^{3.5}$ ) values run from 0, 1, 10, 11, 100, 101 to 1010. The PWM DAC has only one current source so it offers all the advantages of a 1-bit DAC yet, strictly speaking, it requires a 3.5-bit code in order to operate effectively. The PWM DAC is more accurately defined as a 3.5-bit 1-level converter.

A binary 0 holds the current source open for the shortest period while a logic 1010 holds it open for the longest period, the widest pulse being exactly 11 times the width of the shortest pulse. Unlike the PDM DAC which produces both positive (+1) and negative-going (-1) pulses, the PWM DAC simply produces positive variable width pulses (1) and remaining 'wait' periods (0).

The ratio of pulse width (1) to wait period (0) in any given sample determines the voltage of the final analogue waveform at that particular instant. Consequently, each 32x oversample (708.6 thousand millionths of a second) must be able to accommodate the widest pulse width (equal to 11 of the narrowest widths) plus one wait cycle (equal to one of the narrowest widths). Therefore each 32x oversample is sub-divided into 12 equal cycle periods, filled by various permutations of pulse width (1) and wait cycle (0).

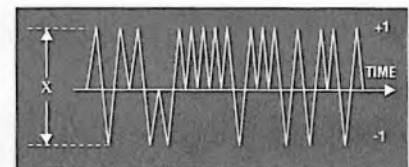
You might think that the Technics' DAC runs at a slightly slower clock speed, after all it does employ less oversampling. In practice the reverse is true because PWM DACs require a clock that is fast enough to trigger the 'start' and 'stop' edges of the narrowest pulse width. This is easily calculated: 44.1kHz x 32 oversamples x 12 widths x 2 up/down edges = 33.8688MHz. So in the event PWM DACs actually require a clock accuracy some three times faster than PDM DACs. This also explains Technics' seemingly outrageous claim of 768x oversampling, for 44.1kHz x 768 = 33.8688MHz!

Because both the PDM and PWM systems are essentially radio frequency pro-

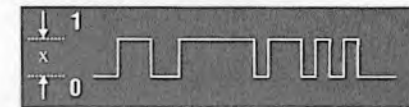
cesses they are both susceptible to RF interference, leading to degradations similar to those caused by jitter in a conventional 16-bit system. Clearly high-speed converters have their own peculiar set of drawbacks, however I would suggest these are potentially less harmful than those inherent in all conventional multi-bit converters.

Furthermore all the problems outlined for 16-bit DACs are increased multi-fold in 18 or, heaven forbid, 20-bit DACs. On the other hand by increasing, say, the degree of oversampling in a PDM/PWM DAC together with a higher-order noise shaper, the resolution within the audio band could easily be increased to 18 or 20 bits. This, while still retaining the virtues of a monotonic 1-bit converter.

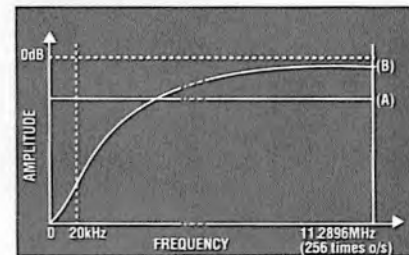
Once Philips' PDM A/D converters are on stream the record-replay chain will be complete and only then can the full potential of the 1-bit system be accurately judged. Either way it appears we are entering a new phase in CD technology, a phase where for once the dictates of cost and subjective performance are not in mutual conflict.



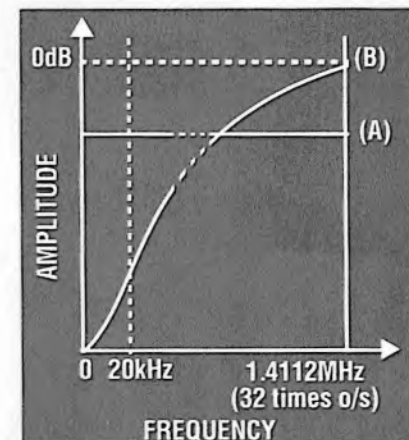
PDM: signal is described by a stream of equal height, equal width pulses.



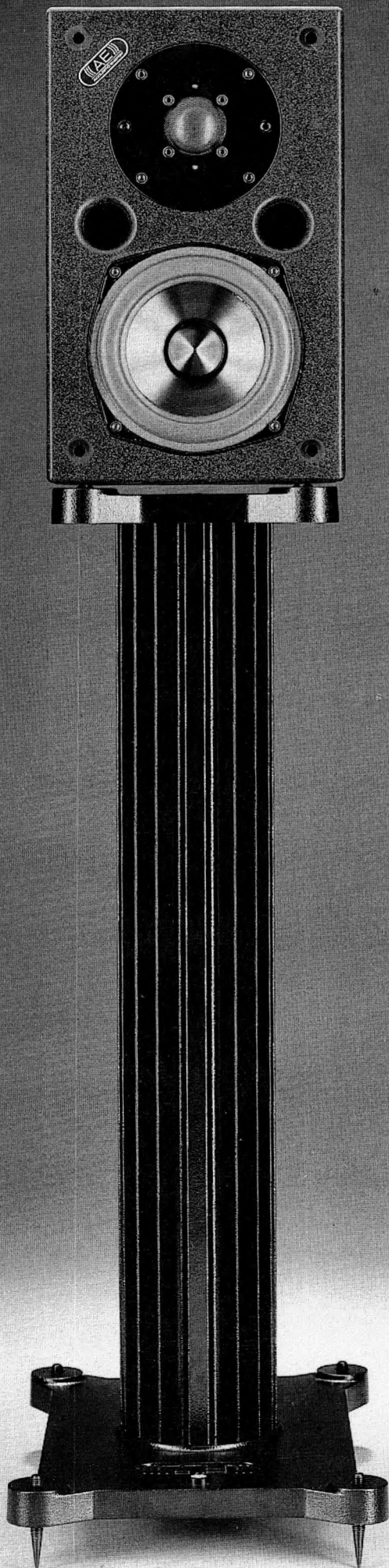
PWM: pulses are fixed in height (amplitude), but vary in width.



PDM: Noise and THD caused by truncation of 16-bit words is spread evenly over 11MHz (a) and redistributed by digital feedback (b).



PWM: Here the noise is spread over 1.4MHz (a) before redistribution by digital feedback (b).



## ACOUSTIC ENERGY SPEAKS FOR ITSELF.

"As far as I'm concerned, the AEI re-defines the art of miniature speaker design"

**John Atkinson,  
Stereophile, Sep. 1988**

"To the author's knowledge, the most awesomely dynamic and articulate miniature ever made"

**Alvin Gold, Hi-Fi Choice, June 1988**

"... the best looking, most immaculately turned out stands I've ever clapped eyes on"

**Jonathan Kettle,  
New Hi-Fi Sound, July 1989**

"The AEI leapfrogs existing references and sets new standards of technical and musical excellence..."

**David Prakes,  
Hi-Fi Answers, March 1988**

### HEARING IS BELIEVING

To audition Acoustic Energy loudspeakers - contact any of the dealers listed below.

**Doug Brady Hi-Fi**  
London WC2  
Tel: 01-379 4010  
(Also at Warrington & Liverpool)

**Grahams Hi-Fi**  
London N1  
Tel: 01-226 5500

**KJ Leisure Sound**  
London W1  
Tel: 01-486 0552

**Le Set**  
London SW3  
Tel: 01-581 3676

**Peter Jones**  
London SW1  
Tel: 01-730 3434

**The Cornflake Shop**  
London W1  
Tel: 01-631 0472

**The Hi-Fi Centre**  
Barrow-in-Furness, Cumbria  
Tel: 0229 38757

**The Listening Rooms**  
London SW5  
Tel: 01-244 7759

**The Audio File**  
Bishops Stortford, Herts  
Tel: 0279 506576

**Clearstone**  
Bolton, Lancs  
Tel: 0204 31423  
(also at Manchester)

**Steve Boxshall Audio**  
Cambridge, Cambridgeshire  
Tel: 0223 68305

**Audio Excellence**  
Cardiff, Wales  
Tel: 0222 228565  
(also at Gloucester & Swansea)

**Chelston Hi-Fi**  
Chelston, Torquay, Devon  
Tel: 0803 606863

**Data Sound**  
Dorking, Surrey  
Tel: 0306 882897

**Wentworth Audio**  
Dunstable, Beds  
Tel: 0582 663383

**Jeffries Hi-Fi**  
Eastbourne, Sussex  
Tel: 0323 31336  
(also at Brighton)

**Hi-Fi Corner**  
Edinburgh, Scotland  
Tel: 031 220 1535  
(also at Falkirk & Glasgow)

**In Hi-Fi**  
Edinburgh, Scotland  
Tel: 031 225 8854

**Lintone Audio**  
Gateshead, Tyne & Wear  
Tel: 091 477 4167  
(Also at Whitley Bay & Durham)

**Manders Hi-Fi**  
Grimsby, Sth. Humberside  
Tel: 0472 351391

**PJ Hi-Fi**  
Guildford, Surrey  
Tel: 0483 504801

**Compact Music**  
Havant, Hants  
Tel: 0705 473952

**The Sound Gallery**  
High Wycombe, Bucks  
Tel: 0494 31682

**Audio Projects**  
Leeds, Yorks  
Tel: 0532 304565

**The Leicester Hi-Fi Co.**  
Leicester, Leic.  
Tel: 0533 539753

**Pure Sound**  
Liverpool, Merseyside  
Tel: 051 645 6690

**Unilet Products**  
New Malden, Surrey  
Tel: 01-942 9567

**Audio Insight**  
Milton Keynes  
Northants  
Tel: 0908 561551

**Basically Sound of Norfolk**  
Nr. Norwich, Norfolk  
Tel: 0508 70829

**Sound Approach**  
Norwich, Norfolk  
Tel: 0603 622833

**Audio Counsel**  
Oldham, Lancs.  
Tel: 061 633 2602

**Stilton Audio Systems**  
Peterborough, Cambs.  
Tel: 0733 297152

**Rayleigh Hi-Fi**  
Rayleigh, Essex  
Tel: 0268 779762  
(also at Chelmsford)

**Audio Centre**  
Sheffield, Yorks.  
Tel: 0742 737893

**Tonbridge Hi-Fi**  
Tonbridge Wells, Kent  
Tel: 0892 24677

**Uxbridge Audio**  
Uxbridge, Middx.  
Tel: 0895 30404

**Acoustic Arts**  
Watford, Herts.  
Tel: 0923 245250

**West Midlands Audio**  
Worcester, Worcs.  
Tel: 0905 58046

Acoustic Energy have distributors in the following countries:

Australia	Finland	Korea	Portugal	Switzerland
Austria	France	Netherlands	Singapore	Thailand
Canada	Germany	New Zealand	Spain	Taiwan
Denmark	Hong Kong	Norway	Sweden	U.S.A.
Eire	Italy			

(((AE)))

ACOUSTIC ENERGY

Acoustic Energy Limited  
3A Alexandria Road London W13 0NP  
Tel: 01-840 6305  
Fax: 01-579 1761 Tlx: 266834



# QUANTUM CABLES OFFER

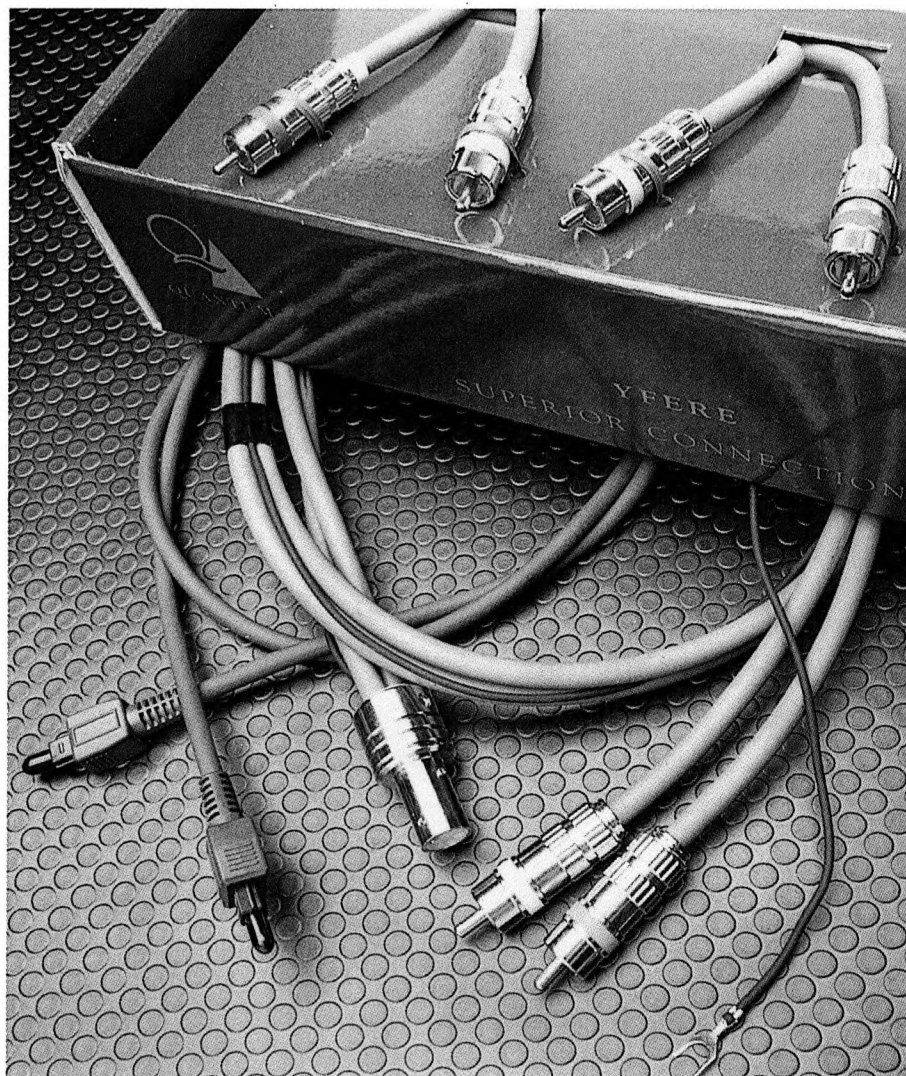
*Improve the sound quality of your hi-fi system with these top quality LC-OFC cables and save pounds.*

**Y**FERE and YBLENT cables and plugs are the latest accessories to be distributed here by Quantum Audio of Scotland. These high quality cables all use linear crystal oxygen free copper wires (LC-OFC) and beautifully crafted solid copper phono plugs which are gold plated. There are two basic configurations: Twin and Quad. The Twin leads employ two LC-OFC conductors of 22 strands, whereas the Quad leads use four conductors of 20 strands.

The *Superior* range of cables really are a gorgeous addition to your hi-fi system. However, for those of you who are on a tighter budget there is also the YFERE *Super* range which uses the Twin wiring configuration but the leads are terminated with less elaborate plugs.

For digital aficionados there is also a high quality fibre optic cable (yes, cables really do make a difference even in the digital domain). And the analogueophiles looking to get the best from their record collection might care to upgrade their arm cable with the *Superior* tonearm cable which uses YFERE's Quad wiring.

Thanks to an exclusive deal with Quantum Audio *Choice* is able to offer its readers these cables at discount prices. Simply fill in the form on this page and leave the rest to us.



*All our prices are inclusive of postage, packing and VAT. Please allow 28 days for delivery.*

## TO ORDER QUANTUM CABLES

*(Tick selections)*

### SUPER

- |                          |                               |                          |                         |
|--------------------------|-------------------------------|--------------------------|-------------------------|
| <input type="checkbox"/> | 004-003 LC-OFC Twin .5m pair  | Rec. Retail Price £43.00 | Our Price <b>£39.95</b> |
| <input type="checkbox"/> | 004-004 LC-OFC Twin 1m pair   | £53.00                   | <b>£49.95</b>           |
| <input type="checkbox"/> | 004-005 LC-OFC Twin 1.5m pair | £63.00                   | <b>£59.95</b>           |
| <input type="checkbox"/> | 004-006 LC-OFC Twin 2m pair   | £73.00                   | <b>£69.95</b>           |

### SUPERIOR

- |                          |                                      |         |                |
|--------------------------|--------------------------------------|---------|----------------|
| <input type="checkbox"/> | 004-001 LC-OFC Tonearm Cable 1m pair | £80.00  | <b>£76.95</b>  |
| <input type="checkbox"/> | 004-010 LC-OFC Phono Quad .5m pair   | £75.00  | <b>£71.95</b>  |
| <input type="checkbox"/> | 004-011 LC-OFC Phono Quad 1m pair    | £85.00  | <b>£81.95</b>  |
| <input type="checkbox"/> | 004-012 LC-OFC Phono Quad 1.5m pair  | £95.00  | <b>£91.95</b>  |
| <input type="checkbox"/> | 004-013 LC-OFC Phono Quad 2m pair    | £105.00 | <b>£99.95</b>  |
| <input type="checkbox"/> | 004-020 LC-OFC Phono Twin .5m pair   | £65.00  | <b>£61.95</b>  |
| <input type="checkbox"/> | 004-021 LC-OFC Phono Twin 1m pair    | £70.00  | <b>£66.95</b>  |
| <input type="checkbox"/> | 004-022 LC-OFC Phono Twin 1.5m pair  | £75.00  | <b>£71.95</b>  |
| <input type="checkbox"/> | 004-023 LC-OFC Phono Twin 2m pair    | £80.00  | <b>£76.95</b>  |
| <input type="checkbox"/> | 004-040 Fibre Optic 1m pair          | £150.00 | <b>£139.95</b> |

### PAYMENT

- I enclose cheque/PO made payable to Dennis Publishing  
for \_\_\_\_\_  
 Please charge my Mastercard (Access)/Visa  
(delete as appropriate)

Credit card number \_\_\_\_\_ Expiry date \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Postcode \_\_\_\_\_

(HFC77)

*Offers available to UK readers only.*

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



# SANSUI

## ARTISTIC DESIGN AND CRAFTSMANSHIP FOR OVER 40 YEARS



### THE AUX 911DG "ALPHA" X BALANCED INTEGRATED DIGITAL AMPLIFIER

- Built in 1 bit LDACS digital/analog converter.
- Separate digital and analog circuits
- Alpha X balanced amp 2 x 160 watts DIN
- Four digital inputs
- Remote Control

JUST PART OF THE NEWLY ARRIVED DIGITAL RANGE OF PRODUCTS  
**SANSUI DISTRIBUTORS, SALES AND SERVICE:**

SOUTH: 01 530 6425

NORTH AND SCOTLAND: 091 2700 772

NORTHERN IRELAND: 0232 342524

# COVENT GARDEN RECORDS

AT

# 84

## CHARING CROSS ROAD LONDON WC2H 0JA

Tel: 01-379 7635/7427

Fax: 01-836 1345

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

### THE COMPLETE SERVICE TO ALL MUSIC LOVERS AT LONDON'S FINEST COMPACT DISC CENTRE



#### NEW RELEASES

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

#### LISTENING FACILITIES

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

#### 8,000 CDs IN STOCK

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

#### SECONDHAND

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

#### TOKEN SCHEME

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

#### SPECIALISTS IN CD PLAYERS

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

#### QUALITY AUDIO

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

#### DELIVERY AND INSTALLATION

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

#### DEMONSTRATION

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

#### SERVICING

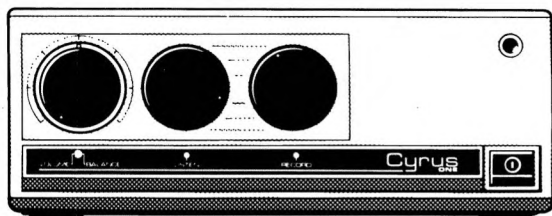
Full up-to-date department for servicing and CD Player specialist upgrading by qualified technicians.

#### DAT

Digital Audio Tape on demonstration.

# CDV

## COMPACT DISC VIDEO NOW ON SALE AND DEMONSTRATION PHILIPS, MARANTZ AND PIONEER IN STOCK FULL RANGE OF 5", 8", AND 12" CDV FROM £4.99



## COVENT GARDEN RECORDS PRESENT

NOW IN STOCK AND ON DEMONSTRATION

# MISSION ELECTRONICS

Complete range of Cyrus loudspeakers now in stock and on demonstration. Also stockists of full range of Mission speakers from the 761 to 765.

PCM 2 CD Player  
Cyrus 1  
Cyrus 2  
PSX Power Supply

£499.00  
£199.00  
£299.00  
£229.00

The superb CD Player, PCM 2 and the improved Cyrus 1 and 2 amplifiers are outstanding products and set new standards for reproducing music as it was performed.

# £50 OFF DISCS

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

HFC12/89

# £6 OFF

ON PURCHASE OF  
5 CDs OVER £9.95

84 Charing Cross Road, London WC2  
No Tokens Given  
Valid to end of DECEMBER 1989

# £1 OFF

ON PURCHASE OF  
1 CD OVER £9.95

84 Charing Cross Road, London WC2  
No Tokens Given  
Valid to end of DECEMBER 1989

Sale & Special offer goods excluded Valid until end of Dec 1989

HFC12/89

HFC12/89



# The Flying Squad

Have you seen these headphones?  
They're the Portalite twins.

## Description

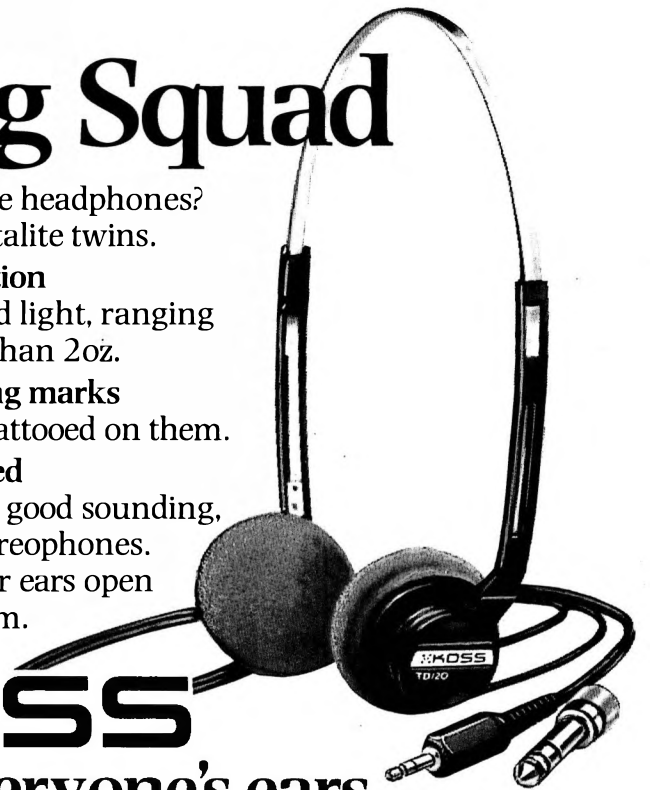
Dark, handsome and light, ranging  
down to less than 2oz.

## Distinguishing marks

Have Koss Portalite tattooed on them.

## Wanted

By anyone requiring good sounding,  
comfortable stereophones.  
Please keep your ears open  
for them.



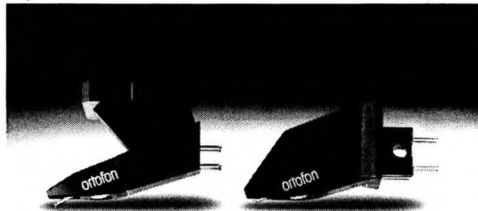
# KOSS

## The word on everyone's ears

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

Please send me full details of the Koss headphone range, plus the address of my nearest dealer:

Name \_\_\_\_\_ Address \_\_\_\_\_ Postcode \_\_\_\_\_



## Optimum Match cartridges start by matching your tonearm. Perfectly.

Optimum Match cartridges start by matching your tonearm perfectly. But that's only the beginning. An OM cartridge from Ortofon makes it possible to upgrade the performance of an entire music system more easily than ever before. And with an OM cartridge, you hear the improvement at once. Music you've heard many times takes

on new dimensions. The term "high fidelity" is suddenly not only a description but an experience.

And the beauty is that an OM cartridge is certain to match your tonearm. And budget. The new Optimum Match series encompasses two categories: 3 standard mount cartridges, and 3 P-mount models. Ask your Ortofon dealer for a demonstration.



ortofon  
accuracy in sound

0753 8899949



# READERS WRITE CHOICE ANSWERS

## A QUESTION OF DISTORTION

With reference to Paul Messenger's *Tech Talk* article (June '89), I would be interested to know why no measurements of loudspeaker distortion were made in the tests.

I am specifically concerned about distortion caused by the voice coil departing from the linear portion of the magnetic field. The inference is that with modern loudspeakers the coil cannot be driven beyond that point and that there's no other form of distortion present. Can this really be true?

I would have thought that a harmonic distortion measurement at 1kHz at say 50 per cent of rated output would be of considerable interest.

P. M. HEATH,  
CHERTSEY, SURREY.

*The basic reason why no loudspeaker distortion measurements are now taken is to enable us to review more speakers, more frequently. The measurements require both a tracking filter and the use of an anechoic chamber, the latter in particular being responsible for a large share of the total time in undertaking the review.*

*Even though it's true that modern loudspeakers do perform better than their predecessors by and large, it is not intended to imply that they do not distort or are immune from the mechanisms to which you refer.*

*Distortion measurements can indeed be useful in pinpointing the problem areas or performance envelope of a specific model. However, there have always been inherent difficulties in attempting to compare different models, since distortion components are very dependent upon frequency response and bass roll-off characteristics, which vary substantially from one model to another. Furthermore, it is very hard to correlate distortion findings with subjective performance; any attributable effects vary unpredictably according to the spectral and transient (peak/mean ratio) nature of the chosen music.*

*In the final analysis, any attempt to compare the*

*distortion of two different models is both very difficult to interpret and still leaves room for criticism, so the omission of these tests from our test programme is not significantly harmful. P.M.*

## CAN COMBINATIONS

I have recently upgraded my system with the addition of a Pioneer PD91 CD player. I do all my listening with headphones and have a pair of Stax Gamma Pros with the SRD17SBMkII energiser for this purpose. The only component yet to be upgraded is the amplifier, a Mission Cyrus Two. I cannot help thinking that this latter component is compromising the sound quality that I'm getting and would be grateful if you could suggest a suitable top end amp to audition. I am thinking along the lines of a Deltec pre/power combo or similar.

C. N. SIMMONS,  
REDBRIDGE, ESSEX

*If you only ever listen on headphones there is another avenue of upgrading open to you that will be cheaper and more effective than an amplifier improvement. That is, to change your headphone energiser for one of the Stax units with inputs for a line level signal (such as that put out by your PD91), and bypass the amplifier altogether. The least expensive of these is the SRD-X Pro at £230 and the most impressive one we've heard is the SRM-T1 which has a valve output stage, and weighs in at a hefty £895. We suggest you audition a couple of these units to find out which one you can't*



*Amplifier by-pass: the Stax SRD-X Pro.*



*The Voyd: In the right set-up it knocks CD on the head.*

*live without and get hold of some high quality interconnect cable. Due to the removal of a major component in the signal path this arrangement will give far higher fidelity to the signal coming from your CD player.*

*Given your requirements, the improvements offered by good pre/power combos will be unlikely to justify the high cost premium involved.*

## THE MESSAGE IS IN THE MEDIUM

I am in need of expert advice. The last time I delved into hi-fi was 20 years ago during my university days when I bought a system consisting of Goldring GL75 turntable, Cambridge P40 amp and B&W DMI loudspeakers. I have a collection of about 200 classical LPs. I've since added an Aiwa F770 cassette deck and a Marantz CD85 CD player to my system and now have sufficient funds (around £5,000) to undertake a major upgrade. I need advice on an amplifier, loudspeakers (bigger than bookshelf but small enough for a 15 x 30ft sitting room) and turntable, arm and cartridge.

However, one major doubt is: is it really worth spending £1,000 - £1,500 on a record player (Linn?) when I could replace most of the records I would want to keep with CDs for about the same cost? Last but not least, could you please include a suggestion for a pair of state of the art headphones, since my family don't always appreciate

my 'Götterdämmerungs'!  
R. FORREST,  
LISBON, PORTUGAL.

*The crux of your query is obviously 'which medium should I go for?' And as you primarily listen to classical music, the decision is not an easy one. On the one hand superior sound quality is available from a good record player, but on the other it would seem that the majority of new classical music is issued on CD only.*

*But given your existing LP collection and the fact that you already have a CD player, we would strongly advise you to get hold of a top class turntable and put it in an excellent system.*

*In our opinion the best system available that will fit your budget is the following: Voyd turntable, Audio Innovations tonearm, Goldring Eroica L Cartridge and Innovations Series 800 step-up transformer (£1,508 complete) feeding a Concordant Excelsior preamplifier (£856) and Innovations First Audio monoblok power amps (£1,349 a pair). Use these to drive Snell Type JII loudspeakers (£700), which will be at their best perched on Pirate J4 (£220) stands, and use Audio Note interconnect and bi-wired Supra speaker cable. If you could afford an extra £900 it would be worth going for Second Audio Amps which have a higher power rating than the Firsts (15 as opposed to seven-and-a-half watts) and thus can provide higher SPLs without clipping.*

AT Labs



'RELAX,

are you  
sitting  
comfortably?



*then we'll begin...*

'RELAX,

*AT Labs*

**CALL, WRITE OR TELEPHONE FOR YOUR COPY OF OUR BROCHURE**

---

01-952 5535 173-175 STATION ROAD, EDGWARE, MIDDLESEX

01-367 3132 159 CHASE SIDE, ENFIELD, MIDDLESEX

01-794 7848 190 WEST END LANE, WEST HAMPSTEAD, LONDON

01-518 0915 442-444 CRANBROOK ROAD, GANTS HILL, ILFORD, ESSEX

*Specialists in hi-fi*



If that sounds overly complex don't worry, in practice it's quite straightforward and any good dealer will be able to set it up for you at home (if you have the appropriate dealer in Lisbon – European distribution for most of this equipment is good but the Concordant may take some finding).

On the headphone front, most would agree that, although expensive, electrostatics are difficult to beat. Both Star and Jecklin make good examples; the former produces energisers (a basic component to the species) which can be driven from tape outputs rather than speaker outputs, which is quite handy. Prices start at around £300.

## AN ALTERNATIVE APPROACH

My current system is somewhat lacking in bass. My budget is about £200 and the room in which the system is installed is approximately 12 by 25 feet. I have a very wide taste in music, from classical to pop, but mainly rock music.

My current system comprises a Sony CDP 770 CD player and Thorens TD 166 II turntable playing through a NAD 3120 and £240 PE, a Harman Kardon PM635 and Sony TA-AX3 amplifiers powering Monitor Audio R1001s, Celestion DL4s and Wharfedale Lintons respectively. Even with extensive experimentation with various balances of amplifier volumes I still find that I am unable to achieve satisfactory bass performance.

Having experienced the exceptional performance of the Bazooka subwoofer system with Alpine CD system in my Metro, I was considering fitting some sort of sub-woofer system in my living-room. Do you think it would be possible to convert my fireplace into a sub-woofer cavity and if so could you please recommend a suitable bass driver? If not could you please suggest any alternative?

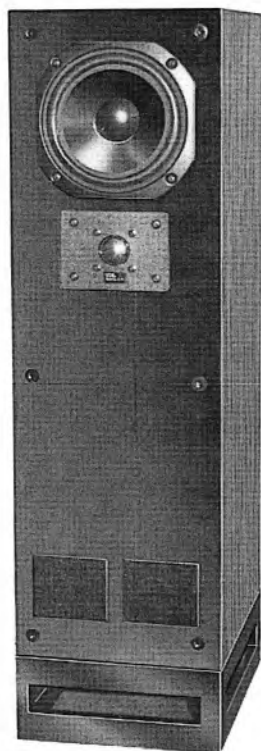
Also do you think that it would be worth while buying a digital-to-analogue converter for the system in the future?

NIGEL STREET,  
LONDON.

*More bass, huh? Assuming that in all other respects you are satisfied with your most unusual set-up, a sub woofer of some kind would probably do the trick. Turning the fireplace into one is a pretty wild idea and one which might just work. Go down to*

*your local disco equipment shop and get some 12inch units and a low pass filter. Oh, and don't forget to block the chimney!*

*Conventional audio wisdom would suggest a somewhat more radical approach, ie cut the wall of sound down to one pair of fairly substantial loudspeakers, for instance some big TDLs, and use them with your NAD integrated/power combo. If nothing else, this will dramatically improve the ergonomics, and should also improve most other aspects of performance, including bass extension.*



*TDL transmission line speakers – great for moving air.*

## ZENONLEC AND THE ART OF PRINTING

Many thanks for printing the review of the Heco 90s in your September 1989 issue. However, there are one or two points which I feel I should bring to your attention. Our company name is mis-spelt (Zenonlec) and the old address and phone number is used, despite an advert on the previous page carrying the correct address. I also believe it a little unfair of Paul to criticise the labelling of the speakers (80E, 90, etc) as I had pointed out at the time to everyone concerned that these were pre-production models. We never deliberately try to put people 'off the scent' and had Paul contacted me on my return from my holiday, I would have reconfirmed this fact. As a matter

of interest the reason for the labelling 'error' is that at the time we received these first samples the factory were unsure as to what we wanted them to be called. In the event we opted for 90s as there was already a model in the range called 80s and we felt 80E would be confusing.

Once again thanks for the opportunity to see one of our products reviewed in print, and hope that in the future no small 'printing mistakes' will marr your excellent publication.

JULIAN ANGELL,  
PRODUCT MANAGER,  
ZENONLEC LTD,  
FOURBURY HOUSE, 36 VICTORIA ROAD,  
MORTIMER, NR. READING, BERKS  
RG7 3SG.

TEL: (0734) 333636.

*The confusion over model numbers stemmed from the fact that the only person at Zenonlec who knew exactly which loudspeakers had been delivered to our reviewer was away on holiday when we were preparing the review, Ho hum . . .*

*As for the unforgivable typographical errors, an internal memorandum has been circulated to all editorial staff: 'Must try harder . . . must try harder . . . must try . . .'*

## GET LUCKY

It was such a surprise to receive your letter informing me that I'd won the runner-up system prize. I had forgotten all about the competition. I only enter these competitions for the fun of it, knowing full well that there'll be hundreds or thousands of correct entries and that it's pure luck when your entry happens to be one of the first pulled out of the hat. I have already received the prize from Marantz. Gee it's some machine, and it sounds great. To say that I'm well chuffed would be something of an

understatement. Thanks for a wonderful prize.

K. HARVELL,  
LYMINGTON, HANTS.

## UNIMPRESSED

I recently purchased a Dual 505.3 turntable and I'm not impressed with the sound. The bass is fine but high frequencies are distorted when I play old or imperfect records. I'm wondering whether these problems would be addressed adequately if I upgraded the cartridge. What do you think? I use a Sony TA-AX 250 amplifier and APM10ES speakers.

WILLIAM GIBBONS,  
DUBLIN.

*Old and imperfect records, especially those that have been 'music-centred' (ie played on crummy decks) require high quality record players to sound really good. And it's ambitious to expect a system like yours to make a good job of them, especially with such revealing loudspeakers. The amplifier probably doesn't help but is unlikely to be contributing to the problem. What might help is a cartridge that's suited to the deck, tracks well and has a slightly rolled-off top end. There's one cartridge that looks like it could do this job ably and inexpensively – the Shure M99E (£26). It won't make scruffy discs sound brand new but should make a more listenable job out of them than your existing needle.*

*If you want to improve the system in the future, consider upgrading the amplifier – look at the Directory for help.*

## EDITOR'S NOTE

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



*Dual 505.3 – unimpressed of Dublin.*

# Uxbridge Audio

Dear Sir

Wembley Park,  
Middlesex.

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

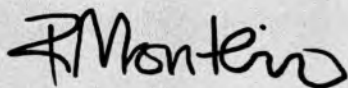
Having embarked on the daunting task of looking for the right music system I visited many Stores and purchased a lot of literature. I was attracted by your advertisement in What Hi-fi magazine. First class sound quality was my top priority and from another article in the same magazine I had made up my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

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

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

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

Wishing your Company every success



Mrs. F. Monteiro

**BADA**

THE ULTIMATE IN  
SOUND ADVICE

TWO DEMONSTRATION ROOMS • 7 DAY EQUIPMENT EXCHANGE OR REFUND • UNBIASED ADVICE

MAIL ORDER ANYWHERE • 2 YEARS GUARANTEE PARTS AND LABOUR • FULL INSTALLATION SERVICE

0% INTEREST FREE CREDIT • FULL SERVICE & TURNTABLE SET UP FACILITIES

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

*Music from the best  
equipment at all  
price levels*

ACOUSTIC ENERGY • A&R CAMBRIDGE • AR • ARISTON • AUDIOLAB  
AUDIOTECH • CAMBRIDGE AUDIO • CREEK • CYRUS • DENON • EPOS  
EXPOSURE • HEYBROOK • JPW • KEF • LINN PRODUCTS • MARANTZ • MERIDIAN  
MICHELL • MISSION • MONITOR AUDIO • NAD • NAIM • NAKAMICHI • QED  
QUAD • REVOLVER • REVOX • ROGERS • ROKSAN • ROTEL • ROYD  
RUARK • STAX • TANNOY • THORENS • WHARFEDALE • YAMAHA



# OPUS 3 CD OFFER

*Special offer to Hi-Fi Choice readers. Save money on Opus 3 compact discs.*

Opus 3 is a small independent Swedish record company famous for its high quality recordings of acoustic music such as jazz, folk and classical.

Opus 3's aim is to reproduce the natural sound of voices and instruments as accurately as possible. To do this they use recording environments with good and natural ambience, and very simple analogue recording techniques. These are purist 'audiophile' recordings where all forms of electronic manipulation that could change the natural sound and 'atmosphere' of the musical performances have been avoided. There are some 90 LPs in the catalogue – and some are now available on compact disc.

Due to a special deal with Presence Audio, Opus 3's UK distributor, *Hi-Fi Choice* is offering its readers these CDs at a special price of £12.95 plus postage and packing. The two sampler discs *Test Record 1 – Depth of Image* and *Test Record 3 – Dynamics* are especially recommended as excellent introductions.

## CD-7810: GITARRKVARTETTEN – Transcriptions

A guitar quartet, formed by four Stockholm guitar teachers, presenting a completely new instrument family consisting of four differently tuned guitars. Using their own transcriptions, they play brilliantly through this recording of baroque, impressionist and Spanish music.

## CD-7900: TEST RECORD 1 – Depth Of Image

Full of unusual musical material produced with the idea of analysing hi-fi systems and their ability to reproduce depth of image. This is Opus 3's best selling recording, containing examples of the work of many of its recording artists.

## CD-8017: RIVER ROAD – Eric Bibb, Bert Deivert

Eric, with his roots in the blues and gospel, and Bert, who is influenced by folk and modern singer/songwriters, perform a selection of warm, inventive songs. A fulfilling sound is achieved with the use of just two acoustic guitars.

## CD-8300: TEST RECORD 3 – Dynamics

This is another Opus 3 compilation disc, with musical extracts carefully chosen to illustrate what is meant by musical dynamics and comprehensive liner notes to show you what you should be listening for. How good is your hi-fi system?



## CD-8401: KNUD JÖRGENSEN – Jazz Trio

Jörgensen is one of Sweden's best jazz pianists, featured here in a traditional trio with bass and drums accompaniment. Most of the pieces on this disc are familiar tunes on which Jörgensen stamps his own colourful temperament.

## CD-8402: LARS ERSTRAND – and four brothers

World famous swing vibraphonist Lars Erstrand with his successful jazz quintet featuring Roland Jivolid (tenor) Knud Jörgensen (piano), Arne Wilhelmsson (bass) and Pelle Hulten (drums). Timeless mainstream jazz.

## CD-8206: LOUIS VIERNE – Symphonies No 5 & 6

Louis Vierne (1870-1937) was one of the foremost organist composers of the late Romantic era. The organist is Torvald Toren who has studied under Flor Peeters in Belgium and Maurice Duruflé in France. Recorded in Hedvig Eleonora church in central Stockholm – the magnificent organ, built in 1975-6, has 58 stops, three manuals and pedals.

**CD-8801: CLARINET CONCERTOS – Mozart, Larsson and de Frumerie. Aria by Crusell**  
Kjell Fagés, solo clarinetist with the Swedish Royal Orchestra, brings back the use of the basset clarinet (specially made for this recording) which was favoured by Mozart. The distinctive timbre of the instrument coupled with superb recording techniques therefore takes us closer to the sound of the music in Mozart's time. The other recordings here are later works by Scandinavian composers.

## TO ORDER OPUS 3 COMPACT DISCS

(Tick selections)

- CD-7810: Gitarrkvartetten – Transcriptions
- CD-7900: Test Record 1 – Depth of Image
- CD-8017: River Road – Eric Bibb, Bert Deivert
- CD-8300: Test Record 3 – Dynamics
- CD-8401: Knud Jörgensen – Jazz Trio
- CD-8402: Lars Erstrand – and four brothers
- CD-8206: Louis Vierne – Symphonies No 5 & 6
- CD-8801: Clarinet Concertos – Mozart, Larsson, de Frumerie, Aria by Crusell

## PAYMENT

- I enclose my cheque/PO made payable to Dennis Publishing for \_\_\_\_\_ selections at £12.95 each  
**Please add £1 per order for postage and packing**

(Available to UK readers only)

Total \_\_\_\_\_

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

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

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

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Postcode \_\_\_\_\_

HFC Opus 77

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





# MARKET RESPONSE

*Dan Houston talks to specialist dealers about CD midi systems, examining brand reliability and current trends.*

Midi systems took over from the music centre and rack-system concept in the early '80s, and have now come to represent a huge slice of the audio equipment cake. Sales of CD based midi systems have risen dramatically over the last year in spite of high interest rates and scare stories about slack business. According to the market research company AGB, volume turnover of CD midis rose by 45 per cent over the twelve months to August this year from the same period in 1988. The value of the market is now put close to £197m. Separates, billed to rise sharply this year, correspondingly managed only a 17.3 per cent volume increase according to AGB – although at the time of writing the 1989 'season' was just beginning.

Market Response looks to the CD midi from the specialist dealers' point of view; we ask them which are the most popular systems and which are the most reliable brands on the market. The aim is to provide readers with a distillation of many dealers' comments and activity in this sector. *Choice* recommends that you spend time (not necessarily much money) choosing your system since your decision will affect listening for pleasure for years to come.

Therefore the logical step is to find a dealer who can demonstrate equipment properly rather than going into a shop and buying a system 'off the rack'. Most dealers represented here are specialists, selling a limited number (on average just four) brands and most sell separates (22-inch) components as well. In fact 22 of 'our' dealers said they sold more separate systems than midi systems and it was a widely held view that whereas CD-midi systems offer a range of features and facilities that is hard to beat, separates of a similar price generally win on sound quality. This translates to the figure one has to spend to get a system of 'reasonable sound quality'.

Dealers gave us sums ranging from £550 to £1,000 with a mean average of £670. You could easily buy a separate CD player, tuner-amp, cassette deck and

loudspeakers for that sum but you might go without remote control, digital tuning and the crucial-to-many high-speed twin dubbing cassette recorder. But dealers, recognising that the midi-system market is featured, also warned that many of the knobs and buttons on offer were of little sonic value. Several told us that where a customer was given the chance to compare the sound quality between separates and a midi-system they often plumped for separates. "You don't get the double deck and graphic equaliser (glorified tone controls) but you tend to get better components," Suttons informed.

Erricks of Bradford told us that their customers had a choice of two demonstration rooms – one upstairs for hi-fi, and one downstairs for 'audio'. "We don't sell midi systems upstairs," Andrew Shooter told us, "and although downstairs we stock midis costing up to £1,000 we recommend that if someone is going to spend more than £600 he should buy hi-fi."

Of course, manufacturers offer dealers a slightly higher mark-up (about five per cent) on separates than on midi systems so there is some incentive to at least demonstrate separates, but this view wasn't held by everyone. Chew and Osborne commented: "many midi systems are made by respected separates manufacturers and the customer has the benefit of compact size, aesthetic harmony and a standard finish among the components without compromising aural fidelity."

## DOES SHE MIND ABOUT THE SIZE?

In previous surveys on this topic dealers have often blamed wives of would-be audiophiles for insisting that *he* buy something which doesn't take over a living-room. "The man chooses the sound, the woman chooses the looks," was how one dealer typically described the purchasing process. Separates are usually seen as an ugly sprawling collection of non-

matching black and less-than-black boxes which wouldn't conform to living-room harmony – or the distaff side of the household's view of that. Bowers and Wilkins told *Choice*: "Midi systems are bought for two reasons: firstly sound and secondly looks."

Certainly the 'upstairs/downstairs' approach of Erricks was confirmed by dealers regarding the midi as something of an underclass in hi-fi circles.

During this survey dealers were less candid about their midi-system customers' profiles but several commented that the midi-size reflected the smaller, average living-room size where it had to vie with other essential consumer durables for space. It was refreshing to hear this compared to previous overtly sexist comments.

One area where the midi market is lacking is with suitable furniture according to Tony Jones of Eastwoods. In the separates field there are a host of isolation tables, wall-brackets or designer furniture to hide your



*Rosewood midi furniture from Technics is purpose-designed but expensive.*



New looks in design from Yamaha: The Astarte system has caused much interest.

system, often starting at a fairly low price compared to that of the system. "There doesn't seem to be anything cheap for the midi system," said Jones, "Technics has a beautiful rosewood cabinet but it's costly (£100) and most customers aren't prepared to spend that much."

### SPEECH IMPEDIMENTS

To make a sweeping comment, midi-systems are generally let down by an appalling pair of loudspeakers. In fact, one can see that when anything half decent in the way of a CD player is going to cost £150, the rest of the components (tuner/amp, double cassette deck, graphic equaliser, record player and loudspeakers) have to undergo the economic equivalent of commuters squeezing on to a tube train in rush hour in a sub-£400 system. Maybe it's because the loudspeakers are last in the chain, maybe because it's very difficult to do anything about the other components – dealers almost unanimously criticised them and felt that customers would do far better buying a pair of (British for want of a better nation) proper loudspeakers.

Dealers praised Kenwood as offering midi systems with optional loudspeakers – which makes buying another pair cheaper against the system cost. And several would take the cost upon themselves, discounting the system and then selling just the unwanted loudspeakers (at knock down prices too!).

We did hear some positive comments for midi-system loudspeakers – notably the Goodmans *Maxim 2s* which are a Best Buy in their own right, and Pioneer offerings, but for the

most part it is worth going for a budget pair of decent boxes (which hopefully won't show up the faults in the rest of the system).

### RELIABILITY

Although the better type of midi system is made up of 'separate' units many are one-piece affairs which therefore represent more of a problem than separates if they break down. Separates allow you to take just the non-functioning component (most often the CD player or cassette deck) back to the dealer, but as Beaver Hi-Fi pointed out: "if one component (*in a midi*) goes down then you have to bring the whole thing back to the shop and you end up without the system for a week or so."

Watts Radio told us that the one-piece system was also more difficult to repair. "On the whole they are inaccessible and fairly tricky to get into – that adds to the time and cost of servicing."

We asked dealers whether midi-systems were more or less reliable than separates and only received positive votes from four of them. Eight felt that midi systems were less reliable and another eight said there was no difference. Our averaged calculation of how many systems arrive from the manufacturer as faulty (to get an idea of quality control at the factory) suggests that midi systems are as reliable as any other hi-fi components, with just under three per cent coming out of the box broken. Dealers felt that this figure was also partly attributable to damage in transit, so construction over the brands we have covered is good.

However, in the long run, the

option of buying a midi system is generally less reliable than buying separates. With separates one has the flexibility to upgrade and replace defunct components, whereas midi systems get chucked away when they become irreparable.

The midi systems that most dealers prefer, both in terms of reliability and sound quality consistency, are those made by Kenwood. Swift of Wilmslow told us: "in the last ten months we have sold 102 Kenwood midis and not had a single faulty unit." Kenwood scored 57 points in our reliability poll, followed by Technics (46), Pioneer (43), Sony (27) and Marantz (24). The only comments on unreliability were levelled at Aiwa.

Several dealers commented that reliability problems were often of the 'self-injury' type caused by customers not knowing how to look after their equipment. It would seem that separates, being bought by the more hi-fi literate are thus also more reliable (or perceived as such). Reliability and build quality are also related to price, but this shouldn't affect the above poll as these brands all offer systems in the budget category.

When and if your midi system malfunctions many dealers felt able to repair it themselves bearing in mind Watts Radio's "very inaccessible" comment.

From their replies we gauged an average repair turnaround time of two and a half weeks which often would be faster if the problem was a common one – such as customers failing to keep the cassette deck's heads and pinch rollers clean for instance.

We also asked dealers which

firms were on the ball as far as service goes. Pioneer, Technics and Marantz came out well while Aiwa was most quoted as slow.

### THE BEST SELLERS

Dealers told us their three best selling models in two price brackets. As mentioned not much is happening in the sub-£400 category but for what it's worth the Sony *101CD* system was most popular, followed by Aiwa's £380 *X55DX* model. Sony's *Compact 302 CD* (£399) system got a few mentions as did the Aiwa *X33-DX* (£320).

Over £400 there is much more competition. The new Technics *X1CD* (£470) scores highest while Pioneer's *S22* with either the *PD282M* multi-play CD player (total: £463) or the *PD272T* one disc machine (total: £560) comes a close second, followed by the £550 Kenwood *M42CDS* set-up. Other best sellers are the £500 Kenwood *M32CDS* and the £550 Marantz *MX393 AVCD* or the more expensive *MX673AV CD* – £800.

For this survey we contacted 30 specialist dealers covering 21 brands of CD midi-system. The most common brands, in order, are Kenwood, Technics, Pioneer, Aiwa, Sony, Marantz, Philips and Yamaha. The random approach means that only the most common brands feature in the best selling or reliability 'polls'.

### PARTICIPATING DEALERS

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

- Active Audio, Derby.
- Aerco Ltd, Woking, Surrey.
- A. Fanthorpe Ltd, Hull, Humberside.
- Analog Audio, Finchley, London N12.
- Audio Excellence, Cardiff, S. Glamorgan.
- Bartlett's Hi-Fi, London N7.
- Beaver Hi-Fi, Liverpool, Merseyside.
- Bowers and Wilkins, Worthing, W. Sussex.
- Brentwood Music Centre, Essex.
- Bridge Hi-Fi, Walsall, W. Midlands.
- Cambridge Hi-Fi, Cambridge.
- Chew and Osborne, Saffron Walden, Essex.
- Eastwoods, Oadby, Leicester.
- Elite Hi-Fi, Harrogate, N. Yorks.
- Erricks of Bradford, Yorkshire.
- Francis of Streatham, London SW16.
- Golding and Co, Colchester, Essex.
- Harrods, Knightsbridge, London.
- Hopkins Hi-Fi, Portsmouth, Hampshire.
- Hi-Fi Centre, Wilmslow, Cheshire.
- Holborn Hi-Fi, Aberdeen, Angus.
- Horns of Oxford, Oxfordshire.
- Now That's Hi-Fi, Portsmouth, Hampshire.
- Rogers Hi-Fi, Guildford, Surrey.
- Stereo Showcase, Glasgow, Strathclyde.
- Suttons, Bournemouth, Hampshire.
- Swift of Wilmslow, Cheshire.
- True Fi, Redhill, Surrey.
- University Audio, Cambridge.
- Watts Radio, Somerton, Somerset.



# JOIN THE CROWD

Join the crowd now going to Doug Brady HiFi. An increasing number of people are discovering that at Doug Brady HiFi you can listen in comfort to a very wide range of products from the inexpensive to the esoteric. The staff are as pleasant as they are knowledgeable and will help you select what is right for your system and your budget. 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 days.**

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

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

Cyrus 2 amp with PSX amplifier.

One of the most sought after makes of integrated amplifiers in our extensive range. Two year guarantee.

### B ADY'S THE MUSICAL EXPERIENCE!







# CHOOSING AND USING . . . CD BASED MIDI SYSTEMS

*Complete stereo systems offer the promise of a genuinely hi-fi standard of sound reproduction, in a convenient and domestically acceptable package. While the shape, size and performance varies widely, the basics are similar. Here we look at the 'building blocks' of hi-fi.*

Music is easily recorded and reproduced using our century's technology, yet is also easily corrupted in the reproduction. Our memories for sounds are good in many ways, yet extremely feeble in others, and in the absence of the 'real thing' we may be quite able to accept a poorly-contrived fake.

By itself this hardly seems important. If we're that easily fooled by the faking process – if we can 'hear through' failings in the reproduction process to the music beneath – why do we need to worry about the quality of the reproduction?

First, although we may not find it easy to pick out the specific faults with reproduced sound, the fact remains that poor sound soon becomes tiring and unrewarding to listen to. Second, poor sound usually means *incomplete* sound. If musical information is missing, we're simply not hearing all the music, and again the act of listening becomes tiring and unrewarding.

It is for these reasons and these reasons alone, that pursuing audio excellence is a worthwhile exercise. For countless thousands of people, a 'hi-fi' midi or rack system has become merely an ornamental centrepiece of the house rather than a tool for playing music, because after the initial excitement had passed, there was little joy left in listening to music. This is the effect of poor sound-reproducing equipment. But there are hi-fi systems which *will* give you musical enjoyment and enduring pleasure.

For many people interested in listening to music in the home, a packaged audio system of the type usually referred to as a midi system is the obvious choice. There is no doubt that choosing your own separates to make a working system has its satisfactions, and under ideal conditions will provide the most worthwhile and musical results. But it is also liable to end up with a rather Meccano-like appearance and wired up with 'a

plateful of spaghetti', to use Sony's memorable description.

The integrated system avoids these problems, with components of matching appearance, sometimes with a piece of furniture to subdue the 'hi-tech' look of bright chrome, control knobs and displays. Choosing a one-make system might appear to guarantee optimum electrical and mechanical matching. But appearances can be deceptive and many apparently well-matched systems (in the technical sense) are anything but.

Increasingly, integrated systems are physically smaller than in the past. Typical component widths have reduced from 43-44cms to 33-36cm now, and this review concentrates on the latter – hence the midi in the title.

## COMPACT DISC PLAYER

The digital compact disc is a fairly recent development in audio – a means of storing information in digital form on small (8 or 12cm) discs, recorded on one side only and giving continuous playing times, extending to over 70 minutes in some cases. The information is stored in a spiral arrangement of 'pits' which are read by a laser which follows, but does not touch the surface of the record. Very low background noise and great linearity of frequency response (up to the cut-off point near 20kHz) are the hallmarks of the system, together with a degree of robustness not associated with conventional records. Small scratches, dust and fingerprints should not affect sound reproduction. CD reproduction is free of the 'pops and clicks' which mar LP sound.

In the few short years compact disc has been on sale, it has grown in strength to the point where it is beginning to rival the more traditional sources in popularity. Most systems (including all those reviewed) are now available with compact

disc, and there are cases (eg Proton) where CD is pushing the traditional record player off the scene altogether.

Compact disc is the easiest source of all to operate. All a CD player needs is a mains feed and one of the inputs on the system's amplifier.

## TURNTABLE

The usual type of system turntable is a simple design which includes auto-return at the end of side, and a magnetic cartridge. Recent design trends look worrying; there is an almost universal use of flimsy plastic mouldings in areas of structural importance (eg headshells) whilst the weight and build quality of the turntable chassis has tended to become lighter and stay static, respectively.

Some turntables are fitted with so-called parallel tracking arms, where the whole arm slides along a runner parallel to the line the stylus describes as it plays the record. Parallel tracking arms are invariably associated with fully automatic operation and in some cases, programmable track-search facilities.

A significant number of turntables incorporate the new *T4P* or 'P'-mount cartridge fitting, where the cartridge plugs into the end of the arm using the terminal pins. These cartridges all have a common specification which means no alteration to any of the arm settings is required no matter what cartridge is fitted. With some turntables, cartridges are not interchangeable at all, and where this is the case, it's indicated within the reviews. The ability to change cartridges provides an easy, if limited route to improving system performance at a later date.

There is a remarkable uniformity in the types of cartridges fitted. Nearly all are standard magnetic designs, bearing the rack maker's name in most cases, but often recognisable as coming from Audio-Technica.

## CASSETTE DECK

There have been changes in the cassette decks supplied with systems too, especially in peripheral areas like transport control and record level meter designs.

Ignoring the sub £450 systems for a moment, the archetypal cassette deck looks something like this. It will have two transport mechanisms, one for recording and playing back in the usual way, the other for playback purposes only. Using the two in combination allows tapes to be dubbed, or played back from one deck and recorded on to the other, and played back one after the other (often known as sequential play or – perhaps confusingly – as continuous play). The dubbing can be done in real time, that is at normal playback speed, but they also allow double speed dubbing. However, there are severe trade-offs when using this high speed alternative, and sound quality always suffers severely.

Cassette decks may also have a range of buttons to operate the transport, a number of controls to set the tape type, the recording levels (with the aid of record level meters), and the noise reduction system.

Better sound quality is the aim of the Dolby C noise reduction system which works very much like the familiar Dolby B but with twice the noise reducing effect. Dolby C is fitted to the more expensive decks whilst Dolby B is almost universal as it is needed to replay pre-recorded cassettes which are invariably recorded to the B format.

Instead of manually instructing the deck what kind of tape you've inserted, cassette decks are learning to recognise tape types for themselves using the notches on the rear of the cassette housings for the purpose. Another much less welcome trend is automatic record level control, or ALC. This means no record level adjustments and is an undoubted boon from the convenience point

## Absolute Advantages Three: Mission To Excel

Both Mission and Absolute Sound and Video share the same single commitment.

To provide only the very best.

The very best products offering the very best value coupled with the very best service.

We believe anything less to be unacceptable.

Which is why our demonstration facilities are second to none. Why we are happy to install any equipment you buy in your own home. And why we will exchange any product you purchase for up to seven days.

Equally, we guarantee all Mission loudspeakers for no less than five years, and Cyrus electronics for two. Our personnel are factory trained to ensure that you get the best possible advice. And we have virtually every product in stock at all times.

Quite simply, nobody does it better.

Should you share such standards, we can help you find the hi-fi that will satisfy your requirements.

Similarly, if you would like to be sent details of the many special offers that we have from time to time, complete and return the coupon below.

Absolute Sound & Video and Mission  
Articulating the arguments for excellence



To: Jackie Carr, Absolute Sound & Video Ltd., 19 Old High Street, Headington, Oxford, OX3 9HS

**YES!** Let me have priority details of any special offers you might have. I have ticked the types of products in which I am interested:

<input type="checkbox"/> Amplifiers	Name: _____
<input type="checkbox"/> CD's	Address: _____
<input type="checkbox"/> Cartridges	_____
<input type="checkbox"/> Cassette Decks	_____
<input type="checkbox"/> Loudspeakers	Postcode: _____
<input type="checkbox"/> Tuners	_____
<input type="checkbox"/> Turntables	Telephone: _____

HFC/12/89

**BRANCHES:** **BASINGSTOKE** 4 Feathers Lane, Basingstoke, Hampshire, RG21 1AS Telephone (0256) 24311 **BRISTOL** 65 Park Street, Clifton, Bristol, BS1 5PB Telephone (0272) 264975 **CHELTENHAM** 40-42 Albion Street, Cheltenham, Gloucestershire, GL52 2RQ Telephone (0242) 583960 **OXFORD** 19 Old High Street, Headington, Oxford, OX3 9HS Telephone (0865) 65961 **SWINDON** 60 Fleet Street, Swindon, Wiltshire, SN1 1RA Telephone (0793) 538222

of view. But the trade-off can be severe, taking the form of a loss of dynamics and increased background noise; this is because the ALC shunts the record levels up and down continuously in an attempt at making everything sound the same volume!

Elsewhere cassette deck design has become relatively static. The most popular feature is one or other variety of programme search where the deck 'listens' for gaps between tracks when in fast wind/rewind mode, switching through stop to play when it finds the gap. This is of obvious use with popular rock music (or when tapes are used to store a number of computer programs!), but the system tends to break down when presented with material with built-in gaps or long, quiet passages. Speech and much classical music are examples of such programme-search-busting material, and for this reason we were disappointed to see the eclipse of normal memory search features linked to the tape counter.

Tape acceptance in most cases is standardised for the three major types: ferric (or standard bias, Type I), chrome (or high bias, Type II) and metal (Type IV), though some are limited in the types of tape they'll accept.

## TUNER

The tuner provides the means of listening to radio broadcasts, and is commonly capable of reception over the three main broadcast bands of interest to UK listeners – FM, MW and LW.

Only FM broadcasts on VHF are inherently capable of high-quality results in stereo. FM can give a smooth, even frequency response to about 15kHz, which is close to the limit of most people's hearing. FM is also the only band where stereo broadcasting takes place. The snag with FM, apart from the relatively complex circuitry necessary to make it work effectively, is the fact that it is a short distance medium with a typical range of only 30 miles or so from the transmitter. Although indoor strip (wire) aerials are usually provided for FM reception, the use of such devices tends to be unreliable if good, hiss-free reception is required. This comment holds especially in the case of stereo reception which typically requires ten times the signal needed for good mono reception. So where a portable (mono) radio may work perfectly adequately with a rod aerial, a stereo tuner will normally benefit from a multi-element (typically

four or more elements) aerial mounted on the roof – or something similar. It's worth taking some time and trouble over the aerial, and employing a specialist local aerial erector who knows the neighbourhood reception problems. Aerial fitting is not usually expensive; note that even a high-quality, expensive tuner will not give of its best from an inadequate aerial.

A good aerial will provide more than just quiet, hiss-free reception. It will also provide a generally more reliable result, free from impulsive 'crackling' interference and other problems.

The two AM bands, medium and long wave, offer longer distance reception and provide the only way of listening to BBC *Radio 4*, for example, when the VHF band is given over to educational broadcasting. However, AM sound quality has very limited treble, and a generally uneven, closed-in kind of sound. The aerials supplied with the tuners – usually a ferrite loop or rod – are about optimum. They may need to be swivelled for the best reception, but attempts to increase the signal level by adding an external long wire aerial are often met with increased interference too. Although reception and sound quality on AM are 'iffy' at the best of times, there turned out to be quite remarkable differences between the best and worst of the tuners tested.

The tuners tested were nearly all of the digital or quartz synthesiser type which lend themselves naturally to convenient preset tuning. Digital tuning can also mean more accurate tuning, though there was evidence from the tests that this was not always the case.

Many synthesiser tuners also had other problems, in particular background whistles and buzzes

in the less well engineered examples. The better synthesiser tuners were free of this defect, however, and were particularly easy to use in preset mode.

## AMPLIFIER

Aptly thought of as the heart of any system, the amplifier accepts the low-voltage outputs from the turntable, CD player, cassette deck and tuner, and boosts them to a level suitable for driving loudspeakers. It also performs a variety of subsidiary functions such as tone controls, filtering and so on.

Although the amplifiers built into the systems came in a wide range of power outputs, this was usually related to price, the more expensive ones generally going louder – though not necessarily sounding better! Where loudspeakers were supplied with lower price systems, their high sensitivity generally made up for the limited power of the amplifier, so that the maximum available volume 'was still quite adequate.

A pair of conventional high-fidelity Wharfedale 505.2 loudspeakers (see Technical Section) was also used during the listening tests, and in most cases the systems were fully able to drive these to high enough volumes to satisfy most requirements. The moral of this is obvious enough – it usually makes little sense to choose a system simply on the basis of its power output unless you've an unusually large room to fill with sound, or you throw a lot of parties!

Sound quality and power output apart, the more up-market amplifiers tended to accumulate additional input facilities and more complex tone controls, often described as graphic equalisers. But many of the features on offer are less than they seem. Leaving all

theoretical considerations aside, a system that works well in the first place will not benefit greatly from using tone controls. Graphic equalisers, which are effectively a number of such controls, each responsible for a narrow band of frequencies, are merely gilding the lily.

## LOUDSPEAKERS

The loudspeaker is not, as is often thought, *the* determining factor for sound quality – the system as a whole is as good as its weakest link, no more. But the loudspeaker does have the crucial role of translating the electrical signal from the amplifier into the vibrations in the air we call sound. The simplest loudspeaker consists of a box housing a single drive unit, but most of them divide the sound into two bands, and channel the low bass frequencies to a large coned unit capable of moving large quantities of air, and the high frequencies to a smaller unit capable of responding quickly. A third midrange unit of intermediate size is sometimes used as well, but it's worth making the point that it's extremely difficult to make a three-way loudspeaker work as well as an equivalently-priced two-way one.

There is one crucial factor that determines how well a loudspeaker auditions – and this is how it's used. It is important to support loudspeakers properly, preferably on tall, open stands of the type stocked by most specialist hi-fi dealers. It's equally important to place them correctly, which often means well away from walls and other obstructions. Occasionally shelf (or wall bracket) mounting gives good results – let your ears be the guide – but placing loudspeakers on the floor and/or behind furniture is a virtual guarantee of unsatisfactory sound.



Superfluous gadgets such as graphic equalisers do nothing to improve sound quality.



# AIWA X-D100

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



The *X-D100* is at the head of Aiwa's brand new range of midi systems. Auto source selection on all inputs, plus remote control make the basic features of this player straightforward to use. However, the minor features associated with the CD player, tuner/timer, and cassette deck especially are somewhat opaque, if not downright obscure. Note that the system cannot be upgraded piecemeal due to the use of flat ribbon interconnects and in most cases common power supplies.

## LX-D10 TURNTABLE

This *LX-D10* has a parallel tracking arm and is fully automatic in operation. Automatically synchronised recording is also possible with this deck. The controls, including left-right shuttle keys for cueing, are ranged in a row on the narrow front panel. The drive system employs a direct drive motor, but construction is disappointingly flimsy and the unit is consequently feedback and shock prone. One other disappointment is that Aiwa has not adopted the *T4P* or any other cartridge fit standard. Only the stylus is changeable. Measured performance is dominated by a ragged cartridge which peaks in output around 2kHz and which rolls off sharply thereafter. The arm/cartridge resonance is very high and the bass subsequently lean. Speed stability is just borderline.

## TX-D10 TUNER

The *TX-D10* has 12 AM presets (a random mix of MW and LW) and 12 on FM, each of which can be assigned a four-digit alphanu-

meric label (RAD 4 or BBC2 for example) if desired. In typical Aiwa fashion, the tuner also has a clock/timer that can be programmed on a one-off basis or for everyday purposes, and a sleep timer facility is also available. Sensitivity and selectivity are of a good standard, on AM as well as FM.

## FX-W10 CASSETTE DECK

Both transports are auto-reverse capable, and are fitted with fashionable cassette shell clamps as an anti-resonance measure, and the record-capable deck also has a quick optical end of side changeover. Special features include normal and high speed dubbing, track search and blank skip. Record levels are set manually, but there's a self-setting routine option for CD only. The frequency response runs show that the deck is quite well set up. There's some treble loss with prerecorded material, but in compensation (and this really does pay dividends when listening) tape to head contact and therefore output stability are very good. There's little wow and flutter either.

## DX-D10 COMPACT DISC PLAYER

This is not a complete CD player, but a deck which feeds a raw digital signal to a DAC (digital to analogue converter) housed in the amplifier. There are theoretical advantages to this arrangement, but they're slight and esoteric, and may be offset within the amplifier, and the design is best seen as a repackaging exercise. For the *DX-D10*, Aiwa has borrowed Sony's Custom File technology. In a restricted implementation, up to 59 discs can

be labelled for instant recognition, a ten digit alphanumeric label being shown in the main display area alongside the calendar style track and other read-outs when the disc is inserted. Predetermined track memory sequences can also be memorised for each disc. Other features include random play, repeat play (including A-B repeat), 20 track programming, index search and various tape editing features.

## GE-D10 GRAPHIC EQUALISER/SPECTRUM ANALYSER

Grandly named it may be, and the multi-mode display and the provision of five user programmable and five preset response shape memories certainly reinforces the impression, but the *GE-D10* has only seven operating controls (acting at 40Hz, 125Hz, 330Hz, 1kHz, 2.5kHz, 6.3kHz and 15kHz) with an excessive  $\pm 12$ dB range in coarse 2dB steps. No means is provided to vary the response of the two channels independently.

## MX-D10 AMPLIFIER & SX-D10 LOUDSPEAKERS

With a powerful 80watts/channel specification (the measured figure however, is just 50watts/channel) and an imposingly heavy-weight build, the *MX-D10* looks like a fitting heart to the system. The range of in/output possibilities is outstandingly wide. Unassigned low level socketry (other than that used by the other system components) includes two digital inputs capable of hand-

ling all the normal sampling frequencies required by DAT etc and a range of inputs capable of handling video as well as audio signals. A full system could include a CDV player (wired using analogue or digital signals), an external cassette deck, a DAT recorder, a NICAM stereo VCR and of course a TV monitor. All video signals are carried on phono sockets.

Other features include BBE and DSL, which can be treated as treble and bass boost controls respectively, but which come with rather fancier descriptions – see *X-D80* review.

The system loudspeakers are large bookshelf or stand mounting designs, reflex loaded, with an asymmetric mirror image layout using three drive units and a sealed enclosure. The engineering is superior to the almost nominal standards used elsewhere, but doesn't match the standards expected of a high fidelity loudspeaker at this price. Their output response looks a little rough and ready on test too, but this doesn't tell quite the whole story . . .

## HOW IT PERFORMS

In sharp contrast to the user-hostile sound quality of the cheaper *X-D80* system, this one comes much closer to legitimate high fidelity standards, though it's still as far from achieving the musical standards of a typical purist system costing £1,000, as the average purist system would be from offering Aiwa style flexibility. In truth I found the plethora of facilities daunting and many will find the system somewhat intimidating.

There was an audible problem with the turntable which was very prone to sharp, almost random speed changes and wow, especially when the system was subject to shock or feedback (a poorly damped servo mechanism is suspected). Even such small influences as closing the CD loading drawer has a momentary impact on the sound. In any case the player sounded a little flat spatially, though the cartridge seemed reasonably

clear and it tracked adequately if not gracefully through difficult, animated passages.

The cassette deck has just a trace of crudeness, noticeable in the elimination of much very low level ambient information and the loss also of the variegated richness in the lower middle frequencies as notes died away. But the shortcoming was not large, and indeed was diminished further with metal tapes, which gave the most articulate and best separated audio performance. Pitch stability was to a high standard, and output uniformity good, noticeably lacking in the modulation noise and dynamic compression endemic with tape. In fact for a tape recorder, it sounded surprisingly un-tape like, which is a real compliment. However, there was rather more low level hum and noise than expected.

I felt the CD player was a little disappointing. It lacks the dynamics and grip of the best, or the stereo depth and overall subtlety. However, it's more than good enough for system purposes, at least in the sense that it's not an obvious weakness. Neither for that matter is the tuner which is creditably good on all bands.

What then of the amp and speakers? Like the CD player, the amp is as good as it needs to be. It's fast, quite powerful and reasonably articulate, though in common with several Aiwa components it's a little ragged when stressed and a little flat and boomy on the bass. The surround sound option however, was musically inconsistent and, well, a dead loss. Finally, although the BBE High Definition Sound system is not as crude sounding as in the *X-D80* system (why?) it contributes little, if anything of value.

Last and not least, we come to the loudspeakers, which let the system down in subtle ways without being disastrously bad. The bass is less precise and less hard hitting than with many smaller speakers, and the mid-band is rather cluttered. Music reproduction therefore tends to lack air and grace, but the tonal response is reasonable, and the overall

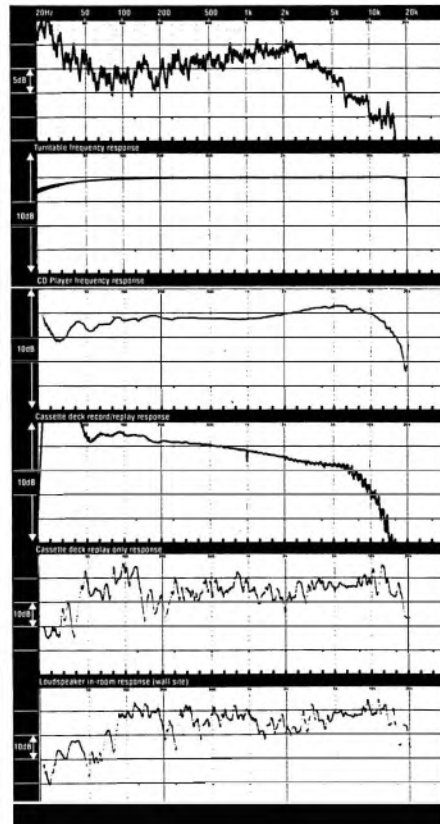
effect is unrefined rather than unpleasant.

## VERDICT

A powerful range of features is offered, with particular emphasis on A/V compatibility and the internal timer, though every component offers a wide array of features. Musically it's less impressive, but although it doesn't attain recommended status by the criteria established for this project, the system sounds pretty reasonable.

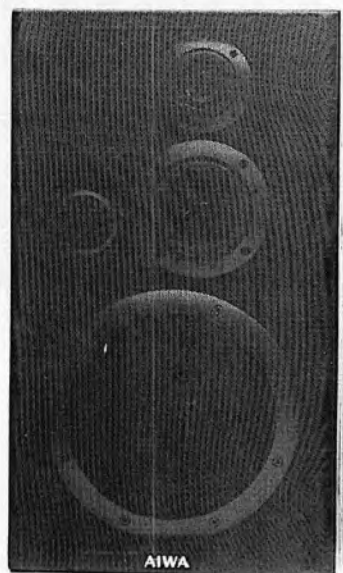
## TEST RESULTS

Cost with speakers	£1,000; without n/a
Options?	none
Size main unit	lid open, w/o projections 90 x 34 x 36cm (h x w x d) 52 x 29.5 x 27cm (h x w x d)
Size loudspeakers	
<b>TURNTABLE</b>	
Wow & flutter wtd	0.13%
Drift	good
Speed accuracy	OK
Arm/cartridge resonance	too high
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	0.4dB
Cartridge channel separation	-28dB
Cartridge tracking ability	80µM
<b>TUNER</b>	
Sensitivity	good
Signal/noise	good
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.10%
Signal/noise ref 0dB Type II	53dB
Distortion 0dB Type II	0.9%
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	101cB
<b>AMPLIFIER</b>	
Power output/channel (8ohms)	45/50/45watts
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	high



# AIWA X-D80K

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



Aiwa's middle cost *X-D80* system is linked together with ribbon cables which somewhat restricts positioning. However, the equipment can be ranged both as a vertical stack or horizontally in two columns. More important though is that the highly dedicated nature of each component to the system as a whole makes it impractical to upgrade the system one component at a time. This might not seem important at the point of purchase, but it's a decision you might come to regret a year or three down the line.

Styling strengths include softly rounded fascias (shades of parent company Sony) and mostly large, clear control layouts, which unfortunately are let down by attention to the way secondary features are implemented. Could this system have come from the Sony design studios – or Sony's latest systems from Aiwa? I think that we should be told.

## PX-ED9 TURNTABLE

Even by systems standards, this unit looks under-engineered. The turntable, which is belt driven and fully automatic, is a lightweight construction with a flimsy plastic platter and a wafer thin rubber mat. The cartridge is a magnetic, but it's not readily interchangeable. However, the player is convenient to use, with all operating controls on the front, facing the user. It is the only source that doesn't operate with the Aiwa's automatic source select feature. Measured performance is poor. Speed stability is bad and the cartridge frequency response declines very sharply into the treble, above 2kHz.

## TX-D9 TUNER

The *TX-D9* has ten preset keys, each capable of storing the frequency of one station on each of the three wavebands (FM/MW/LW) and a standard set of controls, lacking only preset telltales. When switched off, the display reverts to a time read-out, and included in the tuner's electronics are a one-event timer and an everyday timer, which can be used to play any source at a preselected time, and which also helps facilitate unattended recording off-air. There's also a 'sleep' timer with a maximum stand-off time of 99 minutes. The amplifier allows the 'sleep' and timed 'wake-up' volume levels to be set independently. On the test bench, the tuner acquitted itself well, with good standards of sensitivity and selectivity, and low background hiss levels.

## FX-W808 CASSETTE DECK

The *FX-W808* has a unidirectional playback transport and a record capable one with auto-reverse, end of side triggering being mechanical. Almost everything from tape type selection through to setting record levels is performed automatically, and the last of these really defines the deck as a convenience product where sound quality comes second. Dolby B and C are complemented by one-key dubbing (normal and high speed of course) and sequential play. Tape handling aids are limited to auto rewind followed by play. Uncharacteristically for Aiwa, there's no track search, cueing or even a tape counter. As a machine for dubbing CDs however,

the Aiwa is better endowed. There's a dedicated synchronised recording key, and tracks broken across tape sides are automatically restarted from the beginning when the recorder switches to side B (see also CD player description).

Given Aiwa's pedigree in the cassette deck area, it's not surprising to find that the deck's measured performance is good. The headlines include very good speed stability and quite accurately optimised frequency responses.

## DX-D9 COMPACT DISC PLAYER

The display sets the tone: rather mean in presentation, it nevertheless squeezes in a 20-track calendar style read-out alongside more explicit numerical information and function indicators. A numeric keypad is included, and trick play features include a 30-track programme memory and random play. Random track selection is not available on the otherwise reasonably complete remote control handset. Designed to cooperate with the system's cassette deck CD Synchro Edit feature, the player will automatically work out how many tracks on a given disc will fill side A of a specified tape, and pause when they have been recorded until the tape direction is reversed.

## MX-D8 AMPLIFIER & SX-E8 LOUSPEAKERS

At the heart of the system is the *MX-D80* amp which handles all the system components mostly via ribbon cable links (there's no phono option) and will additionally cope



with one extra source component, which could be a recorder of some kind (eg a VCR).

Peripheral facilities are few but notable. There's a rudimentary surround sound facility, a CD direct switch, a variable bass only loudness function dressed up to kill as DSL, and a similarly equipped feature called BBE which is said to straighten up system phase response. The surround sound system corresponds to no proprietary matrix or circuit (eg Dolby Surround) and operates in conjunction with a pair of extra speakers connected to phono (!) sockets. The volume control looks conventional until you discover that it's an electronic device, spring loaded towards the centre position which therefore requires a separate (and only roughly calibrated) volume level indicator. It's an ergonomic disaster. Power output is a useful 30watts/channel.

The *SX-E8* loudspeakers are all about perceived value. The frontage is large and densely populated with no less than three impressive looking drive units and a port, all surrounded by even more impressive bright metal trims. However, the engineering that backs this up is rather crude. The enclosures are lightweight; internal construction is extremely primitive, the captive wiring is of poor quality, the enclosures are not mirror image but should be – and to add insult to injury, the bright metal trims turn out to be plastic! The measured response trend is uneven in the bass, though improved by using them well clear of walls. There's also some unevenness in the upper midband area.

## HOW IT PERFORMS

I found this system rough in overall presentation. The loudspeakers sound large but bland, with an imprecise, shallow but lumpy bass quality and an undercharacterised midband. The only positive note concerns the treble, which is positively grainy and aggressive.

BBE phase correction merely piles on the treble, which given the nature of the system

is the last thing it actually needs. It vandalised a favourite recording of Mozart's Clarinet Quintet, for example, splashiness and grit to an otherwise flat, lifeless and colourless sound. With speech, I found the DX bass boost system totally unnatural and unpleasantly bloated with most music. The tone controls have a surprisingly wide and rather coarse effect far from limited simply to the frequency extremes, but even with everything switched out and the CD Direct input selected, the amplifier sounds synthetic, lacking depth, expressiveness and subtlety.

As Aiwa is a cassette specialist, I had expected the cassette deck to be a little better than others of its breed. In practice it sounded thin and distorted even with Type II chrome bias tapes like TDK SA, and especially with Dolby C which merely exaggerated the problems. Metal tapes are a waste of money, and even ferrics with Dolby C sounded jangly and crude. At no time did any tape reproduce anything recognisable as good bass. Pitch specificity was pretty good, but output uniformity (controlled mostly by tape to head contact integrity) was often suspect. Compact disc handling was slow, and tracking performance on marked discs modest, but sound quality from this source did meet an acceptable standard.

The radio tuner was perhaps the best of all the sources, with a clean, believable and quiet FM section and acceptable AM sound quality to match. Records, partly dominated by a thin, reedy sounding cartridge, were almost as poor as cassette tapes, and much worse than CD or radio.

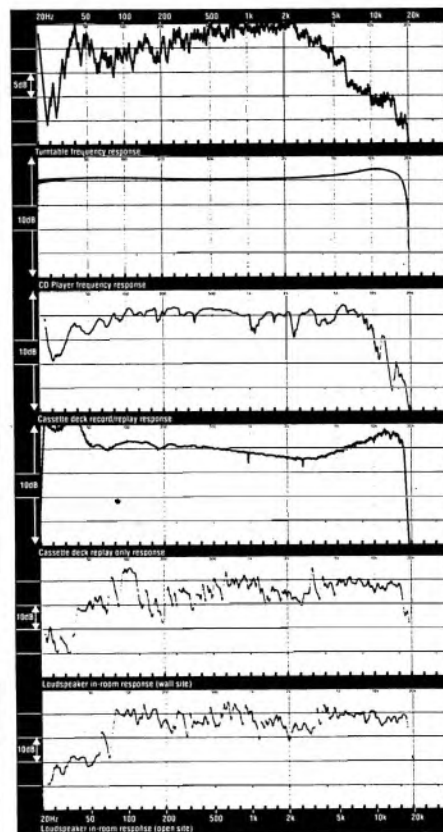
## VERDICT

The inability to upgrade the system is a potential snag, and the fact that the system is only available with the *SX-E8* loudspeakers is another. However, the main point is that musically it doesn't really work. It's well put together and should last, but the concentration on features has had a debilitating effect

on the engineering fundamentals, and therefore sound quality. The timer based features are attractive, though.

## TEST RESULTS

Cost with speakers	£550; without n/a
Options?	none
Size main unit	lidopen, w/o projections 79 x 36 x 38cm (h x w x d) 52.5 x 30 x 20cm (h x w x d)
Size loudspeakers	
<b>TURNTABLE</b>	
Wow & flutter wtd	2.7%
Drift	poor
Speed accuracy	+0.6%
Arm/cartridge resonance	—
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	26dB
Cartridge channel separation	-1.3dB
Cartridge tracking ability	80µM
<b>TUNER</b>	
Sensitivity	good
Signal/noise	good
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.09%
Signal/noise ref 0dB Type II	n/a*
Distortion 0dB Type II	n/a*
*auto level control	
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	>100dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms) (20Hz, 1kHz, 20kHz both channels driven)	25/30/32watts
<b>LOUDSPEAKERS</b>	
Efficiency	above average



# **In 1972 Technics delivered their first equipment to Laskys.**

## **17 years later they're still here.**

Back when flares were fashionable and Gary Glitter was the leader of the pack, Technics delivered their first batch of Hi-Fi to Laskys. Immediately we were impressed.

Seventeen years on, and our relationship is still strong. We provide the correct environment and expertise, they provide equipment of a consistently high and exciting standard. Like the four models featured here.

The RSTR355 Cassette Deck has Dolby B and C, but also boasts Dolby HX-Pro which allows an ordinary cassette tape

to have the recording performance of a metal tape. It also has a twin cassette deck for easier tape duplication and auto reverse for ease of operation.

For those that appreciate the digital quality of CD meanwhile, the SLP333 Compact Disc player is a must. It has Technics Class AA circuitry for better recovery of analogue recorded music as well as superior speed of track access with programmable play.

The radio has also come a long way since 1972, to the point that it's now called



STG560 TUNER £169.99



SUV560 AMPLIFIER £199.99



SLP333 CD PLAYER £249.99



RSTR355 CASSETTE DECK £199.99

a tuner. The STG560 features rotary encode tuning, 39 channel random access presets, autoscans and auto memory. In fact it's so good, it even makes Radio 1 sound wonderful.

And to amplify all that, the SUV560 is in a league of its own. Class AA circuitry guarantees faithful delivery of sound quality to 65 Watts (RMS). It also has extensive aluminium screening of phono and line

inputs with heavy duty aluminium heatsinks.

When you put all that together, it sounds very impressive indeed.

If you're interested in Technics quality, come to Laskys.

It's here waiting for you.



**WE'VE GOT MORE IN STORE**



# FERGUSON HFD28

FERGUSON LTD., CAMBRIDGE HOUSE, CAMBRIDGE RD., ENFIELD, MIDDX EN1 1ND. TEL: (01) 363 5353.



This low-end system from Ferguson is not the least expensive in the range – there's another which sells for a full £100 less and which still boasts a twin cassette deck and CD player. Selling for £100 more almost makes the *HFD28* sound like a luxury product, but rest assured – the old, familiar rules haven't been overturned, and it isn't. The Ferguson system is extremely basic by almost any realistic yardstick.

Despite the Ferguson name, the system is actually made in Taiwan, and there are clear indications that it's more than coincidentally related to the system sold by Goodmans as the *5500* (see review). Some of the components are identical and it's probable that the two products are made on the same production line, or at least in the same factory. Many of the features are very similar, but a few, as we shall see, are quite different, not the least of which is the system's appearance. The Ferguson's aesthetics are better than the Goodman's and although it still looks cheap, it remains a competent looking product at the price.

Everything bar the loudspeakers is incorporated into one system box, which ignoring the record player lid is just a couple of inches taller and wider than an LP. Described by Ferguson as a remote control system, the remote handset has just five controls – power, volume up/down, muting and tuning, the latter equivalent to the tuner's own 'scan' control described below.

It could be argued that the most important feature of any system remote control is the ability to adjust the volume, but I still feel it's

fanciful to promote the *HFD28* as a remote control system. Neither is it reasonable to describe the audio performance standard achieved as hi-fi. Yet both these statements are used prominently on the manufacturer's brochure.

## MAIN SYSTEM UNIT

Nowhere in Ferguson's glossy leaflet or in the press release introducing the product, is any mention made of the record deck. Its existence isn't even acknowledged. And I am forced to observe that this uncharacteristic modesty is richly deserved by the product itself. Yes, the Ferguson does play records, but the player is a pretty flimsy affair. There's a rudimentary arm and platter suspension of sorts, tuned to a rather high frequency. The belt drive hardware is mostly plastic and extremely flimsy. The cartridge is a non-interchangeable ceramic design and operation is semi-automatic – that is, manual setback, automatic return. And why not? The cartridge frequency response is a stranger to straight lines. Output is strongest around 2kHz, and rolls away quickly either side of that point. There's a secondary resonant output peak around 30-40Hz. Other measurements could not be run because I could not connect the system to the test equipment.

Radio reception is channelled through the nearest thing this system offers to hi-tech, CD player apart, in the shape of a three-band digital tuner. It has an attractive back-lit LCD display showing preset numbers and the tuned frequency, plus five preset buttons

which are assigned using the waveband switching incorporated into the row of amplifier source selectors. Ten FM presets are available, plus five each for LW and MW. Mono switching is available for FM, which is just as well since the tuner lacks sensitivity and is often quite noisy except under the most benign reception conditions.

The tape section is a pretty standard affair consisting of two unidirectional transports (one capable of recording) based around mechanical transport controls. There's no manual record level adjustment (which for those not used to the rules is a disadvantage) no noise reduction (eg Dolby) and no provision for metal tapes (which is academic). Ferric/chrome switching is automatic (good). There are very few features as such: just a simple tape counter, normal and high speed dubbing and sequential play. Again it was not possible to run most of the usual tests, but a playback only response run is shown, and was hugely influenced by hum and noise.

The CD player is only powered when CD is selected on the amplifier, so it's not possible to pause a disc, use another part of the system and then return. This aside, the player will do everything obvious including track skip, audible cueing, intro-scan, programming and so on, and displays data about its current status in a neat, simple display matching the one used for the tuner. The only thing it doesn't do is track well, unless the disc is virtually completely unblemished.

Power is provided by an amplifier with a claimed 20watts/channel rating for 10 per

cent THD. Measured in our rather more tightly specified way, we found 12watts/channel. Little flexibility is built into this product: there's a five-band graphic equaliser, a rotary motorised volume control and two meters designed to show average power output in dB, with 0dB somewhere near the full nominal output. Apart from headphone and loudspeaker sockets, there are no outside connection possibilities at all. There isn't even as much as a spare line input or tape circuit.

## LOUDSPEAKERS

Lightweight, sealed with a hardboard back and flimsy carcass, this two-way compact loudspeaker has a ragged response, but a broadly accurate tonal balance, other than in the bass where the output is in decline below 100Hz.

## HOW IT PERFORMS

The test system behaved a little oddly. On a number of occasions, the volume setting on one channel increased to a high level of its own volition, increasing in distortion as it did so, whilst the other channel (and the volume control setting) remained constant. This was probably a one off, but another problem, a propensity of the system to misinterpret bright fluorescent ambient lighting as a control signal, is endemic, and affected the Goodmans system in exactly the same way. What's more there was yet another oddity in the form of high (but variable) levels of hum, and hum harmonics, the way it varied suggesting that the internal earth runs have been incorrectly optimised. Cassettes were the worst affected.

In some ways, the sound produced is reminiscent of what you might expect of a large and rather cheap radio. The sound is too big and grown up for a small radio, yet expensive ones generally go to some lengths to provide the speaker with a physical structure which doesn't simultaneously rattle and sound thin and totally lacking in anything

describable as bass. The Ferguson does all these things, and more. To discuss stereo is essentially meaningless with this product; there's not enough clarity and stability in the sound to produce a meaningful centre mono image; and stereo merely sounds phasey. You can hear different sounds from the two speakers at times, but never anything that could be described as a coherent stereo image free of the loudspeakers themselves.

Pitch stability is a problem. Both records and tapes suffered from high levels of wow that were more than merely obvious on material that relies on a steady hand – piano being a classic example. With CD at least, there can be no real doubt about the integrity of the source. At the same time the system never *sounded* as though pitch rendition was either settled or accurate, perhaps because distortion mechanisms at work elsewhere in the system appear to have had the effect of somehow modulating pitch cues.

As well as suffering disproportionately from hum and other species of background noise (made worse by the absence of Dolby noise reduction), the tape deck was also guilty of a quite absurdly murky sound quality at most times, especially with ferric tapes. The tuner (on FM) and the CD player predictably gave the best results, but there was never any danger that sound quality was in any way real or realistic.

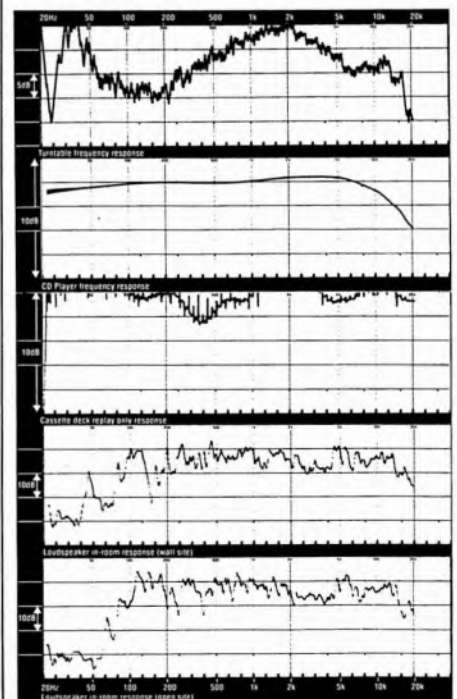
## VERDICT

On the plus side, the Ferguson is a great deal better than the similarly priced and sourced Goodmans 5500, both to look at and to listen to. The higher power amplifier appears to be the key mitigating factor here in an otherwise almost totally downbeat story. On the other hand, being better doesn't mean that it's good enough, and in a thousand and one ways, the Ferguson isn't good enough. Being cheap just isn't an adequate excuse for not doing its job properly.



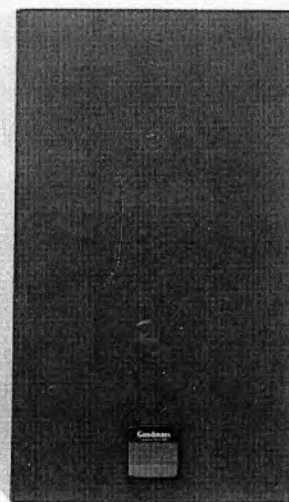
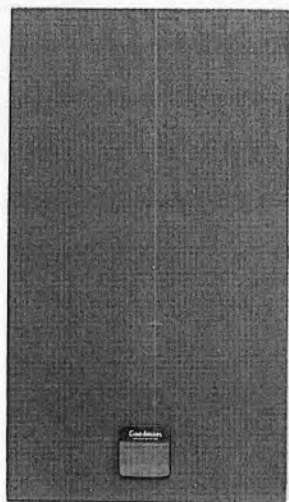
## TEST RESULTS

Cost with speakers	£300; without n/a
Options?	none
Size main unit	lid open, w/o projections 67 x 36 x 40cm (h x w x d) 41 x 21 x 16cm (h x w x d)
Size loudspeakers	
<b>TURNTABLE</b>	
Wow & flutter wtd	0.22%
Drift	poor
Speed accuracy	n/a*
Arm/cartridge resonance	n/a*
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	n/a*
Cartridge channel separation	n/a*
Cartridge tracking ability	n/a*
<b>TUNER</b>	
Sensitivity	poor
Signal/noise	poor
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	n/a*
Signal/noise ref 0dB Type II	n/a*
Distortion 0dB Type II	n/a*
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	80dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms)	12/12/12watts
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	high
*see text	



# GOODMANS SYSTEM 5500

GOODMANS LOUDSPEAKERS LTD., 1 & 3 RIDGWAY, HAVANT, HAMPSHIRE PO9 1JS. TEL: (0705) 492777.



There's no pretending that this system looks anything other than cheap. It is built from plastic mouldings of a quality commensurate with price. Like other systems of this generic type, the fascia is divided horizontally into sections devoted to each functional component – tuner, amp, cassette deck and CD player – though the tape select and dubbing switches are to be found impersonating source input selectors on the amplifier, which is also home to the tuner waveband selectors.

The number of controls is limited and on the whole usability isn't bad, but the aesthetics are not exactly a high spot. Witness for example, the prominent but entirely bogus isolating feet which are included in the main one-piece plastic moulding. However, of greater practical importance are such features as the supplied remote control, although the range of functions it covers is limited. Apart from volume and power on/off, it can scan the radio wavebands when switched to radio, and play CDs or skip tracks when switched to CD. There's no source switching and the handset won't address the record deck or cassette deck at all. This system is therefore best regarded as being semi-remote controlled, if that. I encountered problems on test because the receiver was susceptible to fluorescent lights in the vicinity, which caused the unit to think it was being talked to when it wasn't.

Another word or three about what the system is – or isn't. A look round the back reveals a hardboard back panel, interrupted only by the loudspeaker sockets (phonos,

would you believe!) and a couple of screw terminals for the FM aerial. There are no spare inputs at all, effectively undermining any possibility of connecting an outside cassette player, VCR or any other source. This is a real 'WYSIWYG' system – what you see is what you get, for now and for ever more.

## MAIN SYSTEM UNIT

All the electronics are incorporated into one system box, including the turntable and the CD player. Starting at the top, the turntable is a poor excuse even by the standard of system turntables. The arm, whose job is to support the cartridge rigidly, is made from a thin tube of plastic rather like Polythene. The motor unit is belt driven, and almost as flexible as the arm. The cartridge is a ceramic type and non-detachable. It proved impractical to connect the 5500 to the test equipment, but the cartridge response was run, with the rather peculiar result shown. Note the drastic loss of output below 200Hz.

Although the control layout is slightly unusual, in principle the tuner is not dissimilar to other system tuners. It operates over the usual three bands, and provides a total of 20 presets, ten of which are for use on the FM band, and five each on LW and MW. Only five preset buttons are fitted, so range switching (1 – 5, 5 – 10) is employed for FM using a button described as 'shift'. The usual tuning methods are supplemented by something called auto-scan, which looks for the next receivable frequency up band, but it almost always failed to work on the test system even though a strong signal was available. When it

did work, the tuning stopped 100kHz beyond the required frequency, eg 91.4MHz instead of 91.3MHz. Similar errors occurred on LW, but not MW, for reasons best known to itself.

AM reception is ensured by a built-in ferrite rod aerial, which is a problem as the only way to tackle poor reception, (as the instructions note) is to rotate the whole system. I can just imagine the havoc this well meant advice could cause in a well tended living-room. The system has very poor AM performance off air, and more often than not, the signal is swamped by interference and whistles, so rotating the system for best reception is by no means likely to be a remote problem.

Moving on to the cassette deck we find a typical low-end dual transport design. You could probably guess more or less what it does, but for the record (if you see what I mean), both transports play from left to right only, and as usual one transport records and the other is confined to playback purposes. Sequential play and both standard (real time) and double speed dubbing are available. The Goodmans is compatible with Type I and II (ferric and chrome bias) tapes, and record levels are set automatically. There is no Dolby or any other noise reduction system. A tape counter is available for the record capable transport and . . . that's all, folks. It wasn't possible to run all the normal lab tests due to the lack of a signal input. However, the playback response shape is a disaster, and record/playback behaviour is unlikely to be much better, to judge from the way it sounds.

Mains power is removed from the CD



player unless CD is selected, so discs cannot be left at pause while for example, you catch a news broadcast. Other than this there's nothing of any importance lacking. Up to 16 tracks can be programmed, and other facilities include repeat, track skip and audible cueing, plus intro search. In common with the tuner, the CD player has an attractive orange backlit LCD display, read-outs including track numbers and elapsed track timings. However, tracking ability is minimal.

The amplifier section is rated at 10 watts/channel for 10 per cent THD, which translates into just half that amount measured within the usual nominal distortion envelope. Aside from the input selectors and outputs to loudspeakers and headphones (the latter using the smaller 3.5mm socketry normally used in personal stereo players), the only facility on offer is a five-band graphic equaliser (centre frequencies 100Hz, 350Hz, 1kHz, 3.3kHz and 10kHz), with separate adjustment for each of the channels.

## LOUDSPEAKERS

The label on the front says Goodmans, whilst the one on the back says made in Taiwan. Anyone expecting to find a genuine Goodmans loudspeaker supplied with this system as they are with certain previous systems from this stable, will be disappointed. Both design and construction are extremely primitive by any standards, the system comprising an ultra-lightweight enclosure with a hard-board back and two anonymous drivers. The frequency response plots show how limited output is in the bass, and that the midband is rough and peaky. However, between 2-10kHz the system looks pretty smooth.

## HOW IT PERFORMS

One of the more striking points I noticed early on is that the system is microphonic. You can hear ambient noise being reproduced through the system loudspeakers if the volume level is racked up on any unused

input. This level of microphony undoubtedly has a seriously debilitating effect on music reproduction, though in practice it's difficult to isolate this mechanism from the many others that are busy undermining the system's sonic integrity.

There are problems with every source. The record deck is the worst part, sounding scratchy and thin, with no bass whatsoever, just a curious droning quality in the upper bass or lower midband - typical in fact with ceramic cartridges loaded with a low impedance input (say 50kohm). The tape deck sounded on a par with the kind of performance you'd expect of a reasonably good portable. Speed stability wasn't too much of a problem; but the sound was tonally and dynamically limited, and tape hiss was particularly prominent during quiet passages. The radio was interference bound on AM where many others perform OK, but the FM band was more satisfactory, sounding almost as good as the CD player.

How good is this? Well it's limited, inevitably, by the loudspeakers and the amplifier, the combination of which is hollow, coloured and flat, with the sound falling apart rapidly as the slow acting electronic volume control is wound up further towards its higher settings.

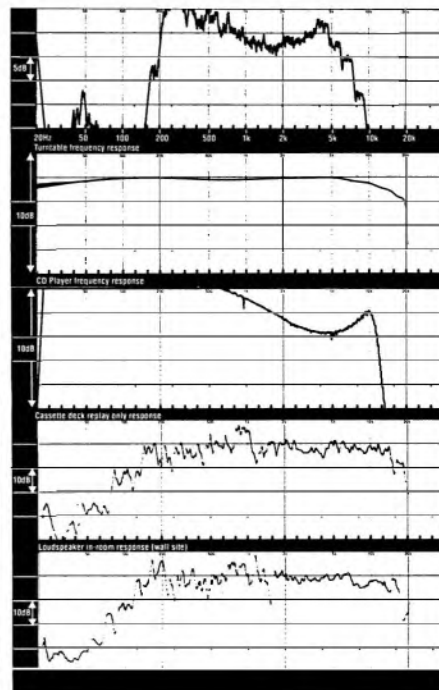
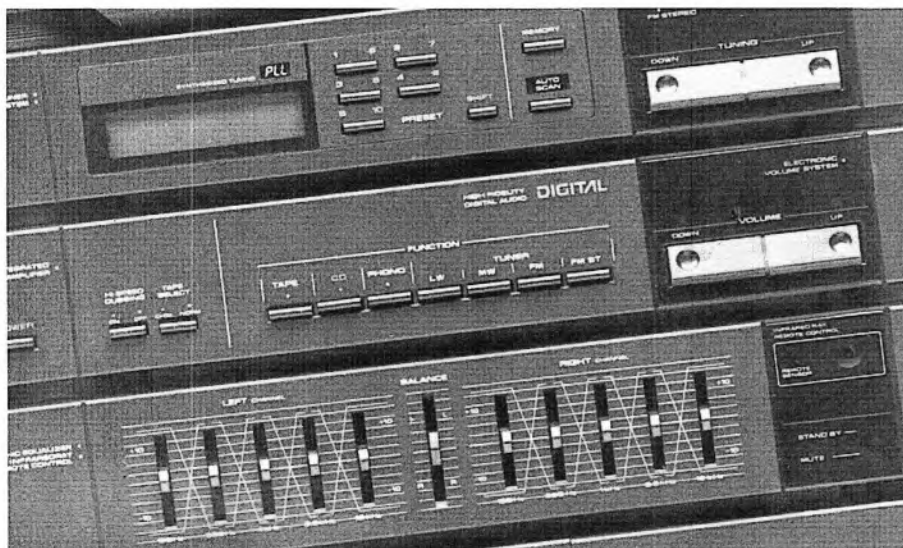
## VERDICT

It's all too easy to fall into the trap of being sniffy about systems like this when dealing on a day-to-day basis with systems costing ten times as much. But it *is* possible to bring realistic yardsticks to bear; after all it is perfectly practical to reap real musical enjoyment from a decent portable radio, and £300 isn't peanuts.

The problem with this system is implicit in the brief: it attempts to be all things at a price almost everyone can afford, and inevitably it fails. It's just good enough to expose its own subtler shortcomings where simpler, portable equipment would tend to cover its own tracks.

## TEST RESULTS

Cost with speakers	£320, without n/a
Options?	none
Size main unit	lid open, w/o projections 66 x 32 x 29cm (h x w x d) 41 x 23 x 16cm (h x w x d)
Size loudspeakers	
<b>TURNTABLE</b>	
Wow & flutter wtd	0.24%
Drift	poor
Speed accuracy	n/a*
Arm/cartridge resonance	n/a*
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	n/a*
Cartridge channel separation	n/a*
Cartridge tracking ability	n/a*
<b>TUNER</b>	
Sensitivity	fair
Signal/noise	poor
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	n/a*
Signal/noise ref 0dB Type II	n/a*
Distortion 0dB Type II	n/a*
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	62dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms)	4/5/7watts
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	high
*see text	

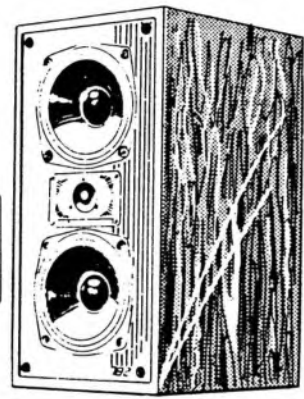


**DATASOUND**

**HI-FI in  
DORKING  
23 SOUTH ST  
DORKING,  
SURREY.  
(0306) 882897.**

**STOP PRESS!  
MISSION CYRUS  
TUNER ON  
DEMONSTRATION  
NOW!**

**MISSION  
ELECTRONICS**



**LISTEN TO THE NEW RANGE OF  
MISSION LOUDSPEAKERS TOGETHER  
WITH THE SUPERB CYRUS ELECTRONICS  
IN THE COMFORT OF OUR LISTENING ROOM**

**WE ARE AGENTS FOR:**  
AIWA ■ AR ■ ARCAM ■ ARISTON  
■ B+W ■ CAMBRIDGE ■ CANTON  
■ CELEF ■ CELESTION ■ DENON  
■ DUAL ■ GALE ■ HEYBROOK ■ JPW ■  
KENWOOD ■ MARANTZ ■ MISSION ■  
MUSICAL FIDELITY ■ NAD ■ ONKYO ■  
PANASONIC ■ PROAC ■ QED ■ ROTEL ■  
SENNHEISER ■ SONY ■ TANNOY  
■ TARGET ■ TECHNICS

■ EXTENSIVE RANGE OF POPULAR AND CLASSICAL CD'S  
■ ALL MAJOR CREDIT CARDS ACCEPTED  
■ UPTO £1000 INSTANT CREDIT (SUBJECT TO STATUS)

**NOW  
OPEN**

**COMPACT DISC &  
HI-FI ACCESSORY SHOP  
in  
CHICHESTER, W.SUSSEX.**

■ All Pop & Rock CD's  
ONLY £9.99  
31 SADLERS WALK  
CHICHESTER  
TEL: (0243) 533963.

**DATASOUND**

**BADA  
THE ULTIMATE IN  
SOUND ADVICE**

- AVON:**  
Absolute Sound & Video  
65 Park Street  
Clifton  
Bristol BS1 5PB  
Tel: 0272 264 975  
Radford Hi-Fi  
52-54 Gloucester Road  
Bristol BS7 8BH  
Tel: 0272 428 247  
Radford Hi-Fi  
12 James Street West  
Bath  
Avon BA1 2BX  
Tel: 0225 446 245  
Radford Hi-Fi  
4 Merchant Street  
Bristol BS1 3ET  
Tel: 0272 294 183
- BERKSHIRE:**  
Radford Hi-Fi  
43 King Edward Court  
Windsor  
Berkshire SL4 1TG  
Tel: 0753 856 931  
Reading Hi-Fi Centre Ltd  
4 Queens Walk  
Reading  
Berkshire RG1 7QF  
Tel: 0734 585 463
- CAMBRIDGESHIRE:**  
Steve Boxshall Audio  
41 Victoria Road  
Cambridge CB4 3BW  
Tel: 0223 68305
- CHESHIRE:**  
Aston Audio Ltd  
4 West Street  
Alderley Edge  
Cheshire SK9 7JD  
Tel: 0625 582 704  
Chris Brooks Audio  
29 Gaskell Street  
Stockton  
Warrington WA4 2UN  
Tel: 0925 61212  
Doug Brady Hi-Fi  
Kingsway Studios  
Kingsway North  
Warrington WA1 3NU  
Tel: 0925 828 009
- DERBYSHIRE:**  
Active Audio Ltd  
12-16 Osaston Road  
The Spa  
Derby DE1 2HR  
Tel: 0332 380 385
- DEVON:**  
Radford Hi-Fi  
28 Cowick Street  
St Thomas  
Exeter EX4 1AL  
Tel: 0392 218 895  
Radford Hi-Fi  
107 Cornwall Street  
Plymouth  
Devon PL1 1PA  
Tel: 0752 226 011
- DORSET:**  
Suttons Hi-Fi  
18A Westover Road  
Bournemouth  
Dorset BH1 2BY  
Tel: 0202 25512
- ESSEX:**  
A.T. Labs  
442-444 Cranbrook Road  
Gants Hill  
Ilford IG2 6LL  
Tel: 01 518 0915  
Rayleigh Hi-Fi  
44A High Street  
Rayleigh  
Essex SS6 7EA  
Tel: 0268 779 762  
Rayleigh Hi-Fi  
216 Moulsham Street  
On-the-Parkway  
Chelmsford CM2 0LR  
Tel: 0245 265 245
- GLOUCESTERSHIRE:**  
Audio Excellence  
58 Bristol Road  
Gloucester GL1 5SD  
Tel: 0452 300 046
- HAMPSHIRE:**  
Absolute Sound & Video  
4 Feathers Lane  
Basingstoke  
Hampshire RG21 1AS  
Tel: 0256 243 11
- Hampshire Audio  
8-12 Hursley Road  
Chadlers Ford  
Hampshire SO5 2FU  
Tel: 0703 252 827
- HERTFORDSHIRE:**  
The Audio File  
40 Hockerill Street  
Bishops Cleeve  
Hertfordshire CM23 2DW  
Tel: 0279 506 576
- KENT:**  
Photocraft Hi-Fi  
40 High Street  
Ashford  
Kent TN24 8TE  
Tel: 0233 624 441  
Standens (Tonbridge) Ltd  
92A High Street  
Tonbridge  
Kent TN9 1AP  
Tel: 0732 353 540  
Tonbridge Hi-Fi Consultants  
31 High Street  
Tonbridge Wells  
Kent TN11 1XL  
Tel: 0892 24677
- LANCASHIRE:**  
W.A. Brady & Son  
401 Smithdown Road  
Liverpool L15 3JJ  
Tel: 051 733 6859  
Norman Audio Ltd  
5 Butler Street  
Preston  
Lancashire PR1 2AB  
Tel: 0772 53057
- LONDON:**  
A.T. Labs  
190 West End Lane  
West Hampstead  
London NW6 1SQ  
Tel: 01 794 7848  
Doug Brady Hi-Fi  
18 Monmouth Street  
Covent Garden  
London WC2H 9HB  
Tel: 01 379 4003  
Grohams Hi-Fi Ltd  
Canonbury Yard  
190A New North Road  
London N1 7BS  
Tel: 01 226 5500  
Hi-Fi Experience  
Lion House  
227 Tottenham Court Road  
London W1P 0HX  
Tel: 01 580 3535
- MIDDLESEX:**  
A.T. Labs  
159 Chase Side  
Enfield  
Middlesex EN2 0PW  
Tel: 01 367 3132  
A.T. Labs  
173-175 Station Road  
Edgware  
Middlesex HA8 7JX  
Tel: 01 952 5525  
Harrow Audio  
27 Springfield Road  
Harrow  
Middlesex HA1 4QF  
Tel: 01 863 0938  
Uxbridge Audio  
278 High Street  
Uxbridge  
Middlesex UB8 1LZ  
Tel: 0895 30404
- WEST MIDLANDS:**  
Alternative Audio  
93-95 Hobs Moat Road  
Salihull  
West Midlands B92 8JL  
Tel: 021 742 0254  
Frank Harvey Hi-Fi Excellence  
163 Spon Street  
Coventry CV1 3BB  
Tel: 0203 525 200  
Griffin Audio  
94 Bristol Street  
Birmingham B5 7AH  
Tel: 021 692 1359
- NORFOLK:**  
Martins Hi-Fi  
85-91 Ber Street  
Norwich  
Norfolk NR1 3EY  
Tel: 0603 627 010
- NOTTINGHAMSHIRE:**  
Nottingham Hi-Fi Centre  
120-122 Alfreton Road  
Nottingham NG7 3NS  
Tel: 0602 786 919
- OXFORDSHIRE:**  
Horns of Oxford Ltd  
6 South Parade  
Summertown  
Oxford OX2 7JR  
Tel: 0865 511 241
- STAFFORDSHIRE:**  
Active Audio Ltd  
29 Market Street  
Tamworth  
Staffordshire B79 1LR  
Tel: 0827 53355
- SUFFOLK:**  
Eastern Audio  
41 Bromford Road  
Ipswich IP1 2LU  
Tel: 0473 217 217
- SURREY:**  
Aerco Audio  
11 The Broadway  
Woking  
Surrey GU21 5AP  
Tel: 04862 4667  
P.J. Hi-Fi  
3 Bridge Street  
Guildford  
Surrey GU1 4RY  
Tel: 0483 504 801  
Spaldings  
352-354 Lower Addiscombe Rd  
Croydon  
Surrey CR0 7AF  
Tel: 01 654 1231
- SUSSEX:**  
Chichester High Fidelity  
7 St Pancras  
Chichester  
West Sussex PO19 1SJ  
Tel: 0243 776 402  
Jeffries Hi-Fi  
4 Albert Parade  
Green Street  
Eastbourne BN21 1SD  
Tel: 0323 31336  
Jeffries Hi-Fi  
69 London Road  
Brighton  
Sussex BN1 4JE  
Tel: 0273 609 431
- TYNE & WEAR:**  
Linton Audio Ltd  
7-11 Park Lane  
Gateshead  
Tyne & Wear NE8 1JW  
Tel: 091 477 4167
- WARWICKSHIRE:**  
Hi-Fi Experience  
44 Park Street  
Leamington Spa CV32 4QN  
Tel: 0926 881 500
- YORKSHIRE:**  
Hi-Fi Experience  
Fotosonic House  
Rowson Square  
Bradford BD1 3JR  
Tel: 0274 309 266  
Image Hi-Fi  
8 St Anne's Road  
Headingley  
Leeds LS6 3JX  
Tel: 0532 789 374
- NORTHERN IRELAND:**  
Lyric Hi-Fi  
163 Sironmills Road  
Belfast  
Northern Ireland  
Tel: 0232 381 296
- SCOTLAND:**  
Halbun Hi-Fi Ltd  
441-445 Halbun Street  
Aberdeen  
Scotland AB1 6DU  
Tel: 0224 585 713  
Russ Andrews Hi-Fi Ltd  
34 Northumberland Street  
Edinburgh EH3 6LS  
Tel: 031 557 1672  
Stereo Stereo  
278 St Vincent Street  
Glasgow  
Tel: 041 248 4079
- WALES:**  
Audio Excellence  
134 Crwys Road  
Cardiff CF2 4NR  
Tel: 0222 228565  
Audio Excellence  
9 High Street  
Swansea SA1 1LE  
Tel: 0792 474 608

Your doctor and lawyer  
are professionals.

## What about your Hi-Fi Retailer?

You depend on the professionalism of your doctor and lawyer. If you truly love music, a lot depends on your Hi-Fi dealer's professionalism as well.

Perhaps the easiest way to judge a retailer is by his affiliations. For example, is he a member of the *only* professional association of Hi-Fi dealers in the U.K.?

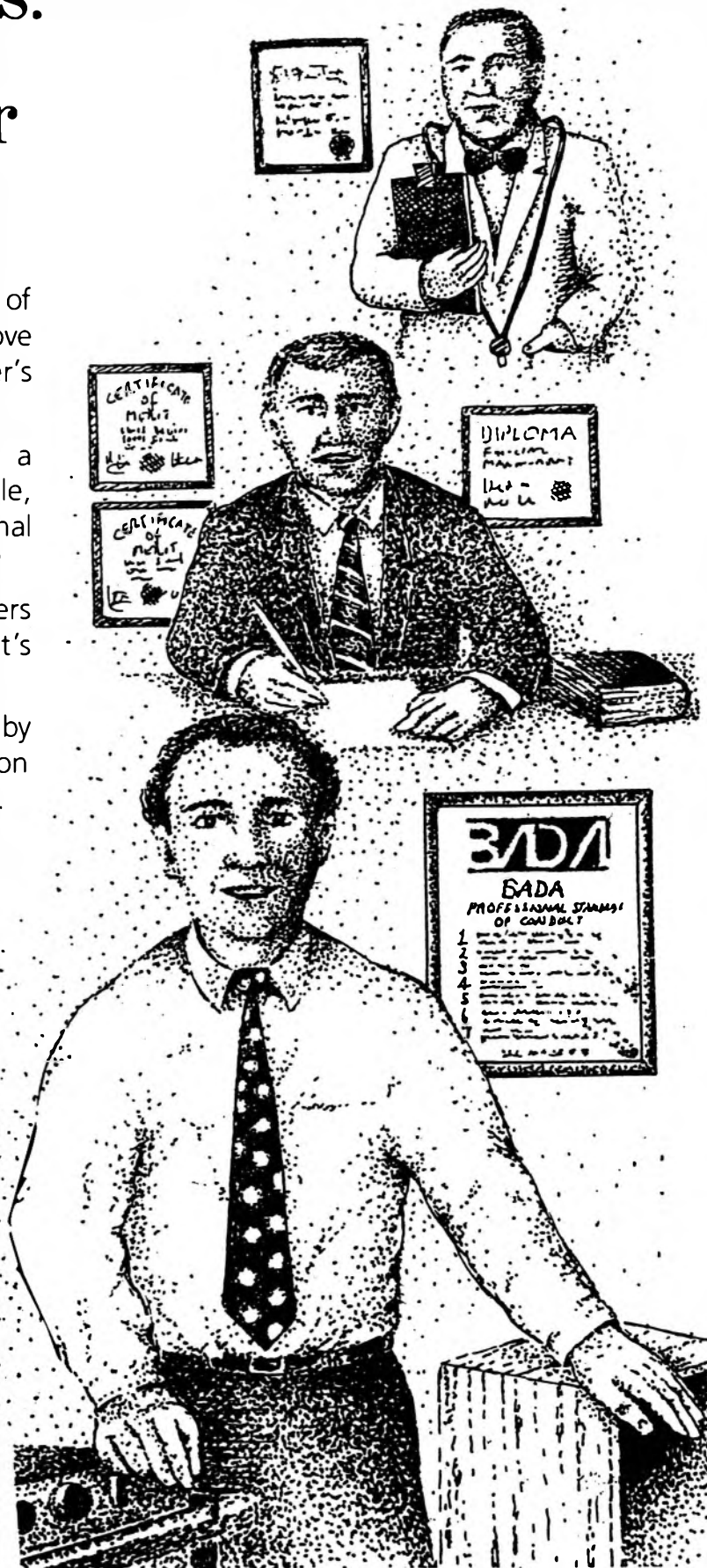
That is BADA, the British Audio Dealers Association. We're not ashamed to say it's a rather exclusive group.

Member dealers are distinguished by a genuine commitment to their profession – and consequently their customers. While they may not carry the same brands, they do share the same ethical standards. They employ knowledgeable salespeople. They offer a two year warranty and have service facilities equipped to deal with today's high technology products.

If you're in the market for good Hi-Fi equipment, you really should visit a BADA dealer.

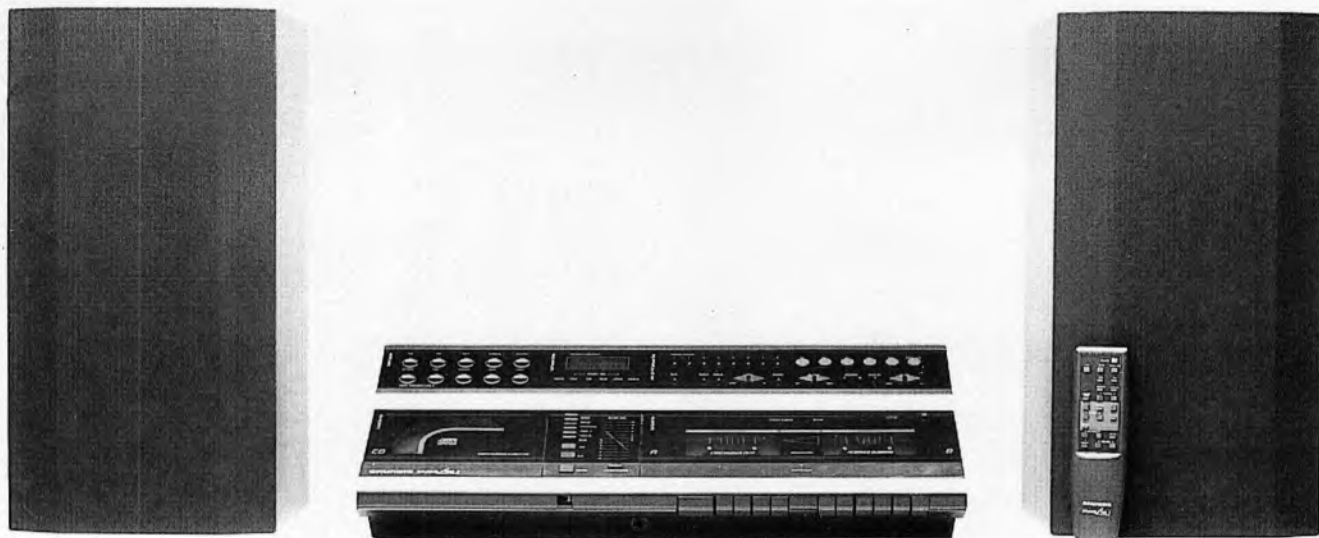
Trust a professional.

To find the BADA Dealer nearest you, check the list opposite.



# GRUNDIG STUDIO LINE 1

GRUNDIG INTERNATIONAL LTD., MILL ROAD, RUGBY, WARWICKSHIRE CV21 1PR. TEL: (0788) 77155.



I was flicking through Grundig's German language brochure, and noticed with some curiosity that no system anything like the *Studio Line 1* was listed. It seems that it is exclusive to the UK, where it's presumably meant to plug a gap that Grundig has identified for a modern looking system with vaguely Bang & Olufsen-ish overtones but without B&O pricing. The unit appears to be aimed at the young family buyer, and as you will see makes no automatic concessions to convention.

The system is presented in the form that in pre-yuppie days was known as the music centre (now described in Grundig's press release as a 'contemporary flat-bed design'). There's no record deck; just sockets for one on the back. The system consists of a CD player, cassette deck, tuner and amp, plus a novel equaliser section. Loudspeakers and a remote control, that icon of late '80s audio, complete the package.

I think it's fair to say that Grundig has so far not been known for its aesthetic sensibilities. Teutonic is a word that springs to mind. But Grundig has been going through a 'thirtysomething-ish' bout of re-evaluation, as a result of which it is becoming more conscious of the real requirements of export markets. The very existence of a UK specific model like the *Studio 1* is a demonstration of this, and so is the sleek, attractive styling. The cassette and CD players are accessed below flaps, and loaded from above, whilst care has gone into points like varying the style and shape of the controls. But the job has been left half done . . .

## MAIN SYSTEM UNIT

The *Studio 1* looks well endowed, but there are some interesting gaps and idiosyncrasies, for example the use of phono sockets for speaker connections. Two pairs can be connected in series to protect the amp, which means a loss of power output in this mode. Then there's the equaliser section. Where other systems are content with a set of tone controls or a multi-band equaliser. Grundig has fitted something it *calls* an equaliser but which in reality consists of ten buttons, each pre-programmed with its own, distinctive set tonal response shape.

There's little obvious rhyme or reason to them; you select on preference, or by using the labels attached to each one: jazz, pop, rock, classical, country, big band, easy, concert, vocal and disco. Thus 'pop' gives a brighter, bouncier sound, 'vocal' adds intelligibility whilst providing a kind of nasal quack (I kid you not!) and so on. But if you don't want to be bothered with all this, bad luck. The equaliser is permanently in circuit.

The auto level control-equipped cassette deck has two mechanically controlled unidirectional transports (one a recorder the other for playback) and sequential play and dubbing (at 1x or 2x normal speed, depending on whether you intend listening to the copy or not). Dolby B noise reduction and a tape counter complete the package. Note that the system can't employ chrome or metal tapes for recording or playback, except pre-recorded -chromes of course, which are designed to be treated as ferric compatibles.

It was wrong of Grundig not to explicitly warn of this fact.

The CD player is a genuine bare bones jobbie, with facilities limited to simple track programming and repeat. Disc handling controls exclude audible cueing strangely enough, whilst the display shows time or track data separately but not together. The tuner is equally simple. It has eight preset keys, each of which stores the frequency of one transmission on each band (FM, MW and LW), giving 24 presets in total. Missing from the tuner is a switch to defeat the stereo decoder, as a result of which weak FM signals are reproduced unnecessarily noisily.

On the test bench, the Grundig could hardly have performed worse. The tuner was OK, (except on AM which wasn't). Measured signal/noise from CD was poor, and the cassette deck measurements had to be aborted on the second sample received (the first suffered amplifier problems) because the tape running speed was completely adrift and the test equipment simply wouldn't latch on. When I attempted to run power output tests (luckily after the listening had been completed), the output stage decided to put on a firework display and promptly expired in the process – and it was only October!

## LOUDSPEAKERS

There isn't much of a story to tell here, largely because the speakers are sealed and no proper examination was possible. However, what is obvious is that they are light in weight, somewhat resonant and extremely large, though the shape still sug-



gests stand mounting and not floor standing. The frequency response (run 'flat' from a conventional amplifier) suggests something of a prominence in the presence region.

## HOW IT PERFORMS

The electronic volume control is far too rapid in its action for fine control, especially at lower volume settings. There's no visual indicator to show the current setting of the volume or balance controls – oh, for an old fashioned rotary potentiometer! In fact Grundig missed an opportunity by not allowing the 'record level' display to register level and balance, which it so easily could have been made to do. It's simply fatuous to describe it as a record level control when record levels are set automatically and the display responds only to *signal* level. One particularly annoying failing is that although the system has both auxiliary and phono inputs, it's an either/or provision. You need to select between the two using a tiny switch on the back of the unit – and this despite the fact that there are separate sockets for the two inputs.

There's more in this vein, too. Grundig should make the power on/off switch look different to the CD play switch, or move it out of the way. Next, an important consequence of the decision to use mechanical transport controls on the cassette deck is that it's effectively removed from the remote control system. This leaves a remote control handset that can control the amplifier, (other than selecting between phono and auxiliary), CD player and the tuner, but which can do no more for cassettes than simply select the tape input. Presumably you'll have to train the dog that fetches your slippers and the *Guardian* to press the appropriate button.

Putting all these rather ill-sorted ingredients into one system may not sound like a very promising idea, but when it came to listening, the Grundig turns out to work better than I had anticipated. It was *almost* good enough...

One of the good points is the loudspeakers – they actually sound warm and comfortable. The bass is on the lazy and fat side for sure, but the treble is surprisingly clear and the effect, using the 'pop' equaliser setting is fast and engaging, whilst the 'concert' setting is a touch warmer and more relaxed. Some of the equaliser settings – 'easy' 'jazz' and 'voice' – and to a lesser extent, 'disco' – completely removed all traces of civilised behaviour from the system, and the 'classical' setting was pretty coloured too. The others were variously interesting and/or acceptable. My favourite in the end was 'concert' for its clarity and evident good integration. There was even some coherent stereo soundstaging: a suggestion of depth, scale and acoustic to accompany the notes.

Most of my listening was done using the CD player and FM tuner, both of which bore the audible thumbprint of some not very distinguished electronics, but which were nevertheless reasonably satisfactory at the price. AM radio reception however, was indistinct and lacking in dynamics even by the standards of this intrinsically indistinct and undynamic medium. The cassette deck was simply a waste of time. It played back all recordings a couple of semitones too slowly, which means that it played back at a slower speed than it recorded at. It hardly sounds credible, does it? Even more extraordinary, was that the slow play speed applied with both transports. Aside from this, pitch stability was all over the place and the background buzzing could not be eradicated. At best the system sounded grubby in quality. Grundig was given the opportunity to replace the (second) system, but was unable to do so in the very short time available.

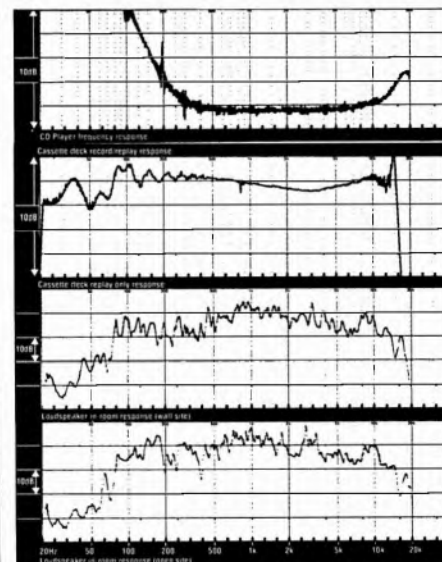
## VERDICT

If it hadn't been for the cassette deck and the power amp's propensity for self destruction, the system might have scraped a recommendation. Of course it's clear that the cassette was faulty, and it's certainly worth exploring

if the rest of the package appeals, but it's my judgement that the cassette deck isn't up to much anyway. I had also been having problems with the cassette deck fitted to the first sample received. There's also some question about reliability, which is a pity, because via CD and radio (FM, not AM) the system often sounded quite engaging.

## TEST RESULTS

Cost with speakers	£330; without n/a
Options?	none
Size main unit	12.5 x 55.5 x 27.5cm (h x w x d)
Size loudspeakers	50 x 25.5 x 25cm (h x w x d)
<b>TUNER</b>	
Sensitivity	good
Signal/noise	fair
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	n/a**
Signal/noise ref 0dB Type II	n/a**
Distortion 0dB Type II	n/a**
*see text	
**auto level control	
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	76dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms)	see text
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	high



# murray hi-fi

FOR REAL SOUND

-  naim
- **ARCAM**
- **rega**
-  LINN
-  **YAMAHA**

103 a BEVERLEY ROAD  
HULL HUMBERSIDE  
HU31RX TEL: 0482 227867

19 MIDDLE HILLGATE  
STOCKPORT CHESHIRE  
SK1 3AY TEL: 061 429 7666

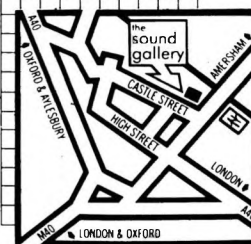
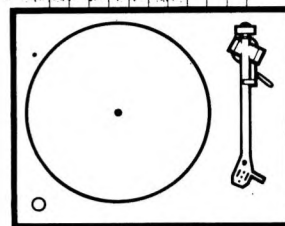
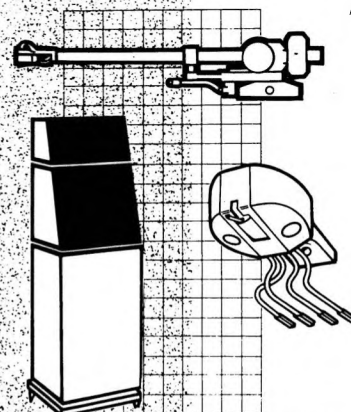
g  
the  
sound  
gallery

ALL CONSULTANTS ARE  
THE SAME. AREN'T THEY?

THE SOUND GALLERY HAS  
ESTABLISHED AN ENVIABLE  
REPUTATION FOR ITS  
PROFESSIONALISM IN THE  
RECOMMENDATION AND  
DEMONSTRATION OF DOMESTIC  
HI-FI. WHATEVER YOUR BUDGET.

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) 3682



- 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 ■



- arcam
- audio technica
- castle acoustics
- celestion
- cyrus
- denon
- mission
- sony
- quad

- apogee
- aragon
- bryston
- kef
- krell
- loewe
- meridian

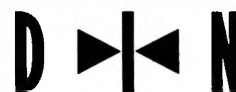


ROKSAN

SOUND SYSTEMS FOR PEOPLE WHO KNOW THE DIFFERENCE

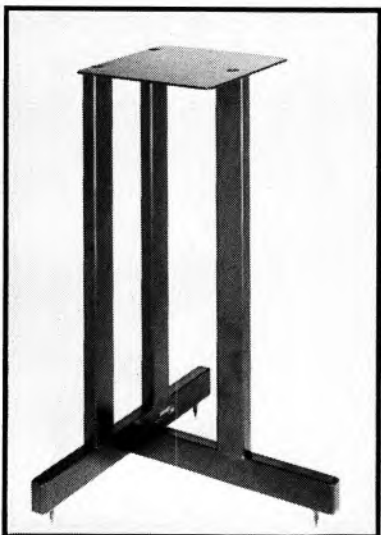


THE ULTIMATE HIFI SHOP  
25 MELCOMBE STREET LONDON NW1 6AG  
TELEPHONE: 01-224 4413



THE ULTIMATE HIFI SHOP  
25 MELCOMBE STREET LONDON NW1 6AG  
TELEPHONE: 01-224 4413

THE  
'T' STAND



▶ JUST ONE  
OF THE NEW  
MODELS  
FROM

TARGET  
*audio*

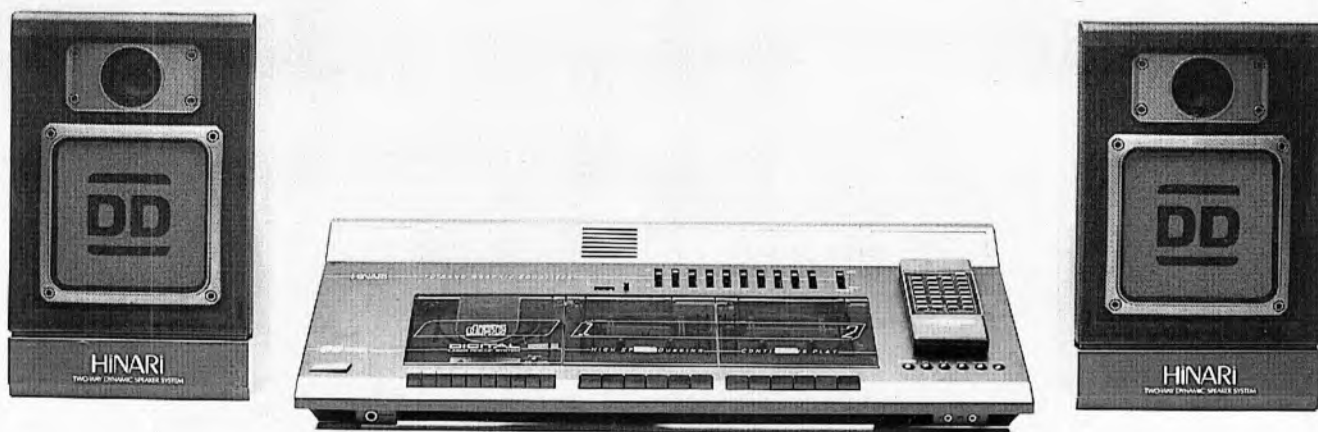
*For our new colour brochure giving details of our entire range and for dealer information - contact:*

**TARGET**   
**AUDIO**  
PRODUCTS

Units 3 & 4 Townsend Centre,  
Blackburn Road, Houghton Regis,  
Dunstable LU5 5BG  
Tel: (0582) 472037 Fax: (0582) 472039

# HINARI DK200 DISC DECK

HINARI CONSUMER ELECTRONICS LTD., UNIT 6-10 EADENHEATH PLACE, WESTFIELD, CUMBERNAULD G68 9HX. TEL: (0236) 722505.



Hinari is not one of the industry majors, but it does have a substantial High Street presence, mostly through multiple retailers like Rumbelows and the Co-op. Hinari also claims that the brand is beginning to be distributed through independent dealers although I don't see Hinari as a strong, independent specialist brand, at least not yet.

Hinari calls this product a Disc Deck, which is a fairly meaningless phrase for what in reality is a reconstructed music centre. A traditional music centre would have had a turntable in place of the CD player but everything else would have been much the same.

## MAIN SYSTEM UNIT

The system contains various discrete components: a CD player, two cassette transports, a tuner, an amplifier, a ten band graphic equaliser and a remote control handset. Presentation is sleek and low, the unit sloping gently upwards towards the rear. At the very back are a couple of illuminated displays, one associated with the CD player, and the other with the tuner. A remote control handset completes the package.

Socketry is fitted to allow certain other components to be used, namely a record deck and any line level item which can be plugged into the 'aux' sockets on the back. This might be the stereo audio output of a video recorder, a CDV player or perhaps an external tape deck. It's also possible to plug a pair of microphones into this system.

Most of the controls are grouped consistently, and the system is potentially at least, quite easy to use. But Hinari has conspired to

snatch defeat from the jaws of victory by lack of attention to detail. For example, I wasted quite a long time searching for the volume control, only to discover there isn't one, at least not on the main unit. There is one on the remote control - incidentally a digital type that works over only a very small number of widely spaced volume steps. Waveband switching and the individual tuner presets are also consigned to the relative obscurity of the remote control, yet you can only select the tuner first using a switch on the main system unit.

All this might have been excusable had the product offered the design consistency and integrity of, say, a Bang & Olufsen, some of whose equipment appears to subscribe to similar thinking. But this clearly isn't the case here. Many of the system controls are indeed available on the main unit, and it makes no ergonomic sense that you can only select tape play on the main unit, whilst CD play can be actuated from the main unit or remote control, and that the volume can only be adjusted remotely. The design suggests nothing more than expediency. It must have been easier to do it this way.

Other points are open to criticism too. The general standard of styling and design is poor. The two displays already mentioned are aesthetically at odds, being different in size and colour. The ten band graphic equaliser sliders (with centre frequencies ranging from 32Hz-16kHz) have no centre detents to facilitate quick and accurate removal of equalisation, and the equaliser can't be bypassed either. The design of the controls is such that para-

llax related errors are almost inevitable, so such errors are quite likely to arise.

The hardware built into the Hinari is very basic, even for a system under £300. The prominent '60watts Music Power Output' claim translates into an actual 6.5watts/channel - 13watts in total in case you've forgotten your 6.5 times table. The balance control had to be set significantly off-centre to achieve an accurate channel balance.

The CD player, which appears to be based on a Philips mechanism, is a top loader, the disc being placed on the player after opening a transparent cover. Play facilities are limited to a non-audible (!) cueing, repeat and programming for up to 20 tracks. The display shows track and index numbers (though index search is not available), or at the press of a button, elapsed time for the current track. Tracking of marked discs was poor, whilst control organisation and logic was such as to make operating errors almost inevitable. Signal/noise performance (measured at the headphone socket) is poor, and the unit's frequency response plummets at 10kHz!

In common with the CD player mechanism, the two cassette transports are top loaders, with access available after opening transparent plastic covers. Whilst continuous (sequential) play and two speed dubbing are included in the package, no noise reduction system (such as Dolby B) is available, and only ferric tapes can be used, Chrome and metal (Type II and IV) tapes are incompatible, and there isn't as much as a warning to this effect in the instructions.



Record levels are set automatically, and a tape counter charts the progress of the tape in the record/replay transport. The other transport is a play only device, and of course both mechanisms are unidirectional. The control system is fitted exclusively to the main unit, and is a mechanical set-up. The playback only response is reasonable, but the record/replay response implies a thin, bright balance. The test was run on our normal Type II and also a Type I tape, with similar results. Wow and flutter is high at 0.30 per cent, though severe long term fluctuations were noted in this figure.

The tuner is a three-band synthesiser driven design which is said to have eight presets, a figure I can't confirm since the presetting feature (and indeed automatic tuning) failed to work. There is no mono switch, and no aerial socket – just a trailing wire, which for test purposes I connected to an outdoor aerial system, with less than satisfactory results. The AM section was even worse, and various birdie whistles and switching noises were completely unsuppressed in this product.

Finish of the system as a whole is variable. To my mind details like the remote control cradle (actually 'park') look cheap, and panel graphics overall are messy. Finally, there's a wild disparity of feel between the various controls.

## LOUDSPEAKERS

The baffle has a rounded top and bottom edge, and is covered in see-through stretched cloth, and behind the cover are two drive units. The tweeter is a small paper cone unit – not a tweeter at all in fact, but closer to a small portable radio speaker to look at, and also to listen to. The bass unit has a flat diaphragm with a large DD sign emblazoned across it. I'm still trying to figure out what it means. Both units have plastic moulded chassis trims that are made to look like metal, and large, impressive looking fixing screws that in reality are nothing of the kind.

The words 'Hinari – Two-Way Dynamic Speaker System' are written large across the bottom of the fascia. What does it all mean, I ask to myself? And the answer comes in a flash, as though by divine inspiration. What it means is – nothing. Nothing at all. I think.

The in-room frequency response proves it. Bass output is plainly very shallow irrespective of positioning, though the plots imply better integration with the speakers when used away from walls. Much more interesting however, is the response shape above 1.5kHz, which is probably where the tweeter takes over from the bass unit. From this point on, the response is in disarray. There's a sharp output peak centred on 5-9kHz, and there appears to have been no attempt at proper integration with the bass unit.

## HOW IT PERFORMS

The loudspeakers are phasey, hollow and coloured, the treble (what there is of it) being atrociously grainy and coloured. The tuner AM bands failed to perform useably at the test site on any transmission – it usually wasn't even possible to tell if it was tuned correctly – and the FM section was permanently noise bound. In any case, FM offered poor, harsh sound quality which overloaded with catastrophic distortion during peaks on heavily modulated transmission. The cassette deck wobbled as it shrieked and the CD player – best of the sources – still conspired to sound harsh and crude, aided and abetted by the amplifier and loudspeakers which are disgraced by some portable radios of my acquaintance.

## VERDICT

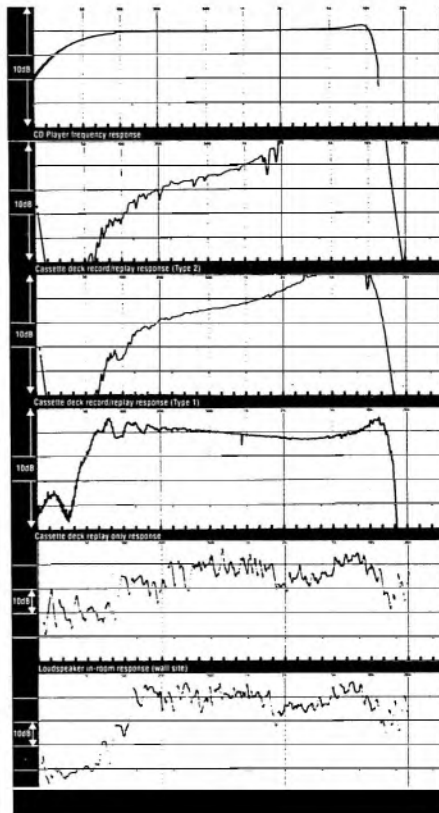
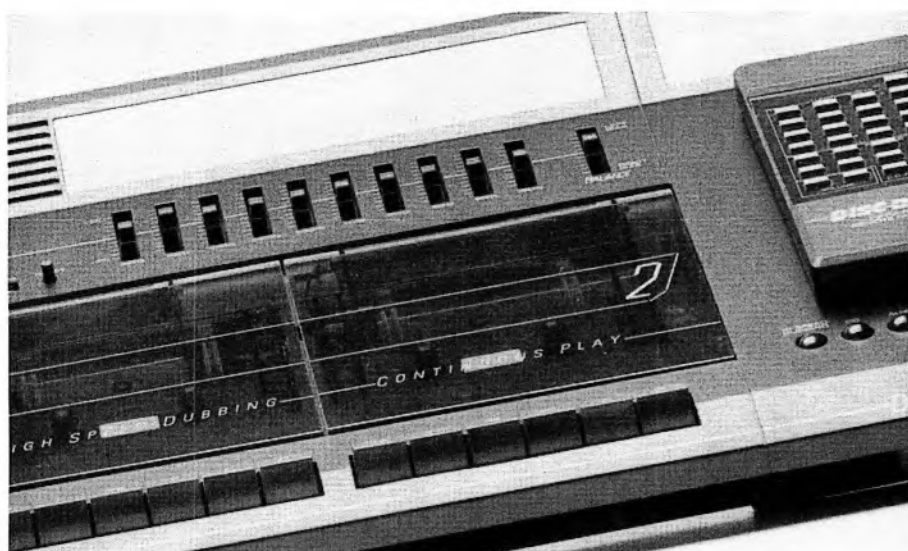
I was deeply disappointed in the Hinari. The control system is completely bodged, and sound quality is at the mercy of some of the worst electronics I have encountered in a midi system for a long time.

Of course, it would be foolish to expect hi-fi sound from a system costing just £300, but even this unit's suitability for a child's bed-

room is debatable given the poor radio performance. A teenager would probably be better served by an up-market, CD-capable portable 'blaster'.

## TEST RESULTS

Cost with speakers	£300; without n/a
Options?	none
Size main unit	lid open, w/o projections 8 x 60 x 30.5cm (h x w x d)
Size loudspeakers	34 x 21 x 14cm (h x w x d)
<b>TUNER</b>	
Sensitivity	bad
Signal/noise	bad
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.30%
Signal/noise ref 0dB Type II	n/a*
Distortion 0dB Type II	n/a*
*auto level control	
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	70dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms) (20Hz, 1kHz, 20kHz both channels driven)	6.5/6.5/6.5watts
<b>LOUDSPEAKERS</b>	
Efficiency	high



**THE SPECIALISTS**

# Rayleigh Hi-Fi

216 Moulsham Street. On-the-Parkway.

## Chelmsford

Tel: 0245-265245  
(3 LINES)

44a High Street.

## Rayleigh

Tel: 0268-779762  
747571

### MY FRIEND SAID THAT YOU'D SO ME OUT

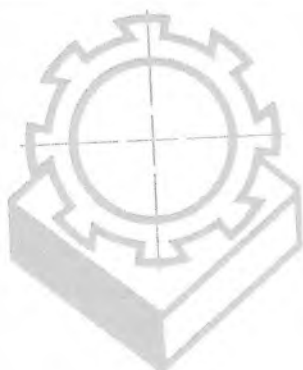
(IN THE NICEST POSSIBLE WAY!!)

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

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

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

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



Roksan Turntable Xerxes.....£655.00  
Artemiz Tonearm .....£450.00  
Shiraz Cartridge.....£489.00

This superb combination now on demonstration  
Roksan Hot Cakes now in stock.

HIGH QUALITY HI-FI FROM:

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

### NEW ARRIVALS

NEW REGA ELA LOUDSPEAKERS  
£405

*"Superb performance, must be heard"*

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

**3 YEARS PARTS AND LABOUR GUARANTEE ON HI-FI SYSTEMS**



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



**THE SPECIALISTS**

# the Audio shop

hi-fi specialists

**music** (-z-), n. The art of expressing or stirring emotion by melodius & harmonious combination of sounds, sounds so combined, record or score of these for reproduction, books &c, containing scores, any pleasant sound, (*Movies, studios*)

128 Poole Road Westbourne Bournemouth BH4 9EF Telephone 0202 762160

# Radlett Audio

"THE GREATEST LITTLE SHOP IN THE COUNTRY"

CONSULTANTS



**M**aybe it's just an opinion (we're too modest to suggest otherwise), but during our 11 years here we have been told many times by importers, manufacturers and customers, that we are "The best little shop in the country."

Being small has advantages. Without the vast overheads of a large, flashy shop, we can devote as much time as it takes to ensure our customers get the best for their money, whether it's £5 or £5,000. Futhermore, we are all knowledgeable enthusiasts (not salesmen on commission) with no need to push the most profitable lines. And we never rush, hassle or waffle—we like to keep our customers as friends.

Our demonstration studio is furnished as a sitting room, but stocked with one of the finest ranges of Hi-Fi in the country, including the largest selection of valve amps anywhere. Each and every item is ruthlessly chosen for it's 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-MARANTZ  
 COUNTERPOINT-KOETSU-CREEK-AUDIOLAB-VTL-VOYD-J.A. MICHELL-EPOS-KRELL-QUAD  
 SNELL-SD ACOUSTICS-MAGNEPAN-ORACLE-MENTOR-ROTEL-INFINITY-MUSICAL FIDELITY  
 SME-HELIUS-TANNOY-DENON-B+W-KEF-A+R-CAMBRIDGE-YAMAHA-MONITOR AUDIO-  
 AND JEFF ROWLAND

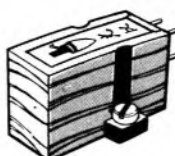
Radlett Audio Consultants  
 141 Watling St, Radlett, Herts.  
**0923-856497**  
 ALSO AT: Sounds Good,  
 147b Uxbridge Road  
 Ealing, London W13 9AU  
**01-579 3963**



CAMBRIDGE AUDIO CD3



LINN LP 12



KOETSU RED



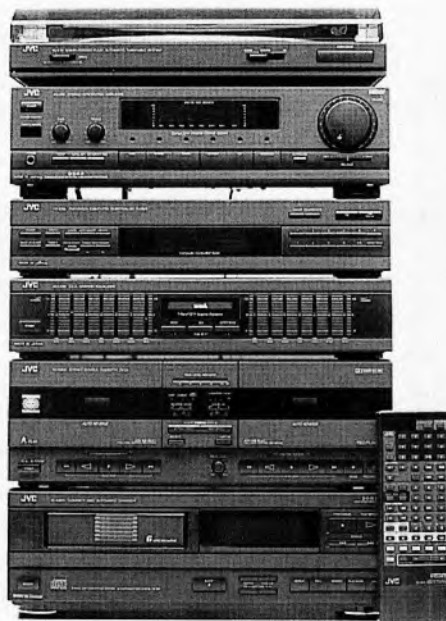
EAR 509 MKII



PRO AC TABLETTE

# JVC MIDI-W91CDM

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



This is a test of a grown up midi with genuine pretensions of high fidelity, with many powerful operating features and a nice, high price to match.

Two points stand out. First, this is a genuine component system in a way that many comparable systems aren't. By this I mean that all units interface with each other using standard phono leads, albeit with a separate datalink to distribute commands. However, the system continues to work if this link isn't available, and the JVC can therefore be upgraded and improved wholesale at any time in the future.

The *W91CDM* therefore, may well be a better long term proposition than many others, yet it still has the advantages that go with being a true, dedicated system and not simply a group of similar looking components. Thus a touch on any source selector will start that source going. Selecting tape on the amp for example switches the cassette deck into 'play' mode. Similarly, operating any source directly allows it to be heard. Selecting a tuner preset causes the amplifier to change to the tuner input and so on. Other linked features allow synchronised recordings to be produced, including full editing features so that recordings aren't split across side breaks. There's also a record level adjustment device which monitors a disc in scan mode, adjusting for the highest peaks it encounters. Naturally, it also comes with full remote control.

Point two concerns aesthetics. I'd guess that JVC's designers were given a brief to humanise the look of the system and make it

a little less daunting and flight-deck-of-Concorde-ish. But what you've got are components with vaguely rounded off horizontal lines, dark matt grey plastic fascias, and utterly conventional control and displays and a frontal design that slopes gently backwards as it goes up. If the equipment is placed so that it slopes smoothly back, which is the obvious arrangement, the visual effect is disconcerting, almost drunken. Yet the alternative 'zigzag' arrangement, with the bottom lip of each component vertically above the next in line, looks worse.

## AL-E71 TURNTABLE

There are no surprises here. A basic belt drive design with moderately good speed stability, everything is thin, flimsy and floppy. The platter is at least metal and the cartridge is a *T4P* type, and therefore readily interchangeable. Operation is fully automatic, a feeler that pokes through the platter acting as a record size sensor. The cartridge is a quality item which measures well. However, the auto-arm return reacted prematurely (and continued to do so, after adjustment) which prevented measurements being run where the test signals were close to the inner groove. It also prevented listening to the last few minutes of some records.

## FX-E91L TUNER

The tuner is one of the highlights of this system. It offers no less than 40 presets, any of which can be used without restriction on FM, MW or LW. They're accessed using 1-10 and 10+ keys, or by using a 'preset scan' key,

but it would have been nice to see simple  $\pm$  keys to step through them. Never mind, there's plenty more, in particular a clock with two independent timers and a sleep timer which can be assigned to any source, and which also allows absentee recordings off-air. Sensitivity and selectivity on FM are good; but AM performance is both grubby and compressed.

## TD-WE91 CASSETTE DECK

Everything important is here. Only one of the two transports records, but they both have full auto-reverse operation, Dolby B and C, auto tape type recognition, manual input level setting (with five step, 16dB range meters to assist), one key two speed dubbing, track search on both transports, and well laid out logic transport controls. The auto reverse mechanisms are mechanically actuated. Lab test results show the deck to have a fine standard of performance in all key areas.

## XL-ME91 COMPACT DISC PLAYER

JVC's disc magazine leaves about as much to be desired as its rivals. I noticed in particular that the system is 'blind', that is it's quite incapable of determining which slots in the magazine are occupied without tediously attempting to load each one in turn. It also has rather poor error trapping - for example, it fails to alert the user when a disc is inserted upside down, which is all too easy with this kind of product. The magazine is a little easier to load than the Pioneer equiva-



lent (which also holds six discs), but it appears to demand a larger mechanism, resulting in an unusually bulky player. The disc magazine takes full size 12cm discs only. Spare magazines, including a version for 8cm discs, are available as options.

The player has a powerful range of attributes. The six-disc magazine capability is matched to a very easy-to-use set of controls to help pick the disc(s) and track(s) you want, and there's a powerful memory with 32 steps programmable randomly from six discs plus a whole raft of special play and programming functions aimed at the user who wants to compile tapes from sequences of tracks stored on disc. The aids extend to time programming for user specified tape lengths.

## SEA-E91 GRAPHIC EQUALISER

For some time, JVC has described its equalisers as sound effects amplifiers, a phrase that encapsulates its *raison d'être* rather better than the usual term. This one consists of a seven-band device, with separate controls for each channel. A central bank of three controls provides essential switching, plus 'super bass', which to me sounds a bit like spreading honey on the jam. The *SEA-E91* contains no spectrum display (other than an illuminated SEA logo); that task is left to the amplifier.

## AX-E91 AMPLIFIER & SP-E91BKE LOUDSPEAKERS

Power output of the mean looking amp is 55watts/channel. In addition to its auto switching functions already covered, it has one spare tape circuit, a spare line input and a simple surround sound matrix. A record level sensing/setting circuit is available for use when dubbing CDs, and there's an ugly spectrum display which will probably get on your nerves as quickly as it did mine. Needless to say, it cannot be defeated. The loudspeakers are more for show than substance. There are three asymmetrically disposed

drive units in left and right handed enclosures, the drivers being crude in design, and the enclosure flaky and lightweight. The frequency response shape is extremely ragged.

## HOW IT PERFORMS

Sound quality (using known hi-fi speakers – not the ones supplied for review) was unspectacularly middling-to-average. There was nothing really wrong with it, yet given music that required some analysis and subtlety it tended to fall down. A favourite recording of the Strauss *Four Last Songs* (Schwarzkoph/Szell etc on CD) sounded flat and boring, and not as it should have been, to wit vital and gripping. It seems this was partly because there was a tendency for the lead (in this case, voice) to dominate the mix unduly. Stereo information, and indeed dynamics also seemed more compressed than expected – and this on the strongest of the sources, compact disc. Neither the tuner (on FM) nor the cassette deck did much better, the latter especially proving itself capable of high standards of resolution, dynamics and soundstaging, and a trace of real liveliness with or without noise reduction. Records sounded less good. They reproduced without any special shortcomings other than a thin and rather under flabby bass, but pitch integrity was fine.

A flabby, ill-controlled bass was very much part of the case for the prosecution with the loudspeakers too. In this respect they share something with the speakers supplied with the Pioneer System 330, and also in the treble, which is qualitatively distinct from the bass, sounding detached yet clear. The effect is not unpleasing on much material. However, they suffer a sharp nasal coloration which spoils the ship for what cannot be much more than the classic h'penny worth of tar.

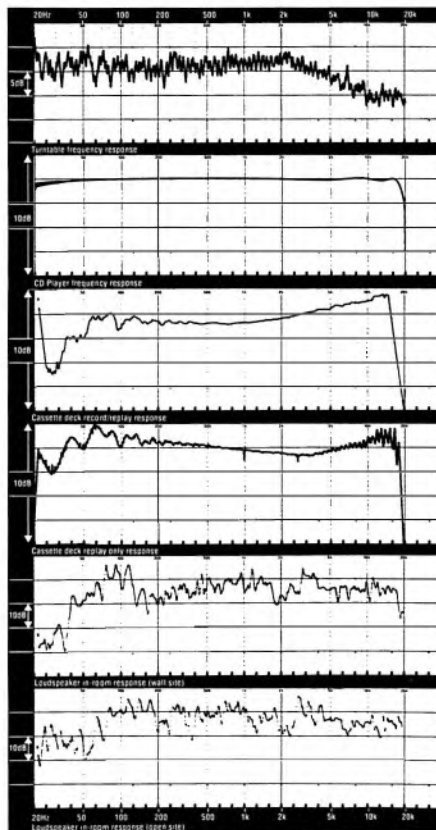
## VERDICT

I am disappointed, though not surprised, to find that JVC has not seen fit to allow this

system to find homes without the speakers. They pull the overall system performance down from moderate (ie just above average) to well below the standards of the best of its peers. In features terms, the system cannot be faulted, the multi-disc player will be particularly attractive to many, and the auto-source select and linked (synchronised) recording capabilities make it a pleasure to use. Taking everything together, the effect is worthy but a mite underwhelming.

## TEST RESULTS

Cost with speakers	£1,111; without n/a
Options?	SP-ES3 speakers for surround channel
Size main unit	lid open, w/o projections 86 x 36 x 37cm (h x w x d)
Size loudspeakers	53 x 29 x 22cm (h x w x d)
<b>TURNTABLE</b>	
Wow & flutter wtd	0.17%
Drift	average
Speed accuracy	n/a*
Arm/cartridge resonance	n/a*
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	0.9dB
Cartridge channel separation	-29dB
Cartridge tracking ability	80µM
*see text	
<b>TUNER</b>	
Sensitivity	good
Signal/noise	good
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.06%
Signal/noise ref 0dB Type II	52dB
Distortion 0dB Type II	0.55%
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	89dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms)	55/55/60watts
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	high



## THE KENWOOD KX660



Recommended retail price £169.00

**Our price £139.00**

**KAMLA** ELECTRONICS

251, TOTTENHAM COURT ROAD, LONDON W1P 9AD  
Telephone: 01-323 2747 (4 lines)

"(A) number of alternative search facilities .....combine to form a powerful set of tools for this often tedious task.

The main user interface is unusually well designed.....The meters are excellent , high resolution , two -colour vertical columns, scaled clearly from -20dB to +12dB.

The KX-660 rates rather better as a recorder.....The precision and stability suggests that modulation noise is low and there's little waffle or muddiness.

The KX-660HX is one of the better decks in its market sector. It is stable and well focussed and works consistently with a wide variety of blank tapes."

Hi-Fi Choice October 1988

**CAM**  
*Audio!*

"IF WE CAN'T HELP  
YOU, WE'LL TELL YOU  
WHERE TO GO."

**110 MILL ROAD  
CAMB IDGE  
(0223) 60442  
CLOSED THURSDAYS.**

## KIMBER KABLE

Dealers, Customers, reviewers and manufacturers have all been raving about the new Kimber Silver cables.

We can arrange for your home audition of these or any of the Kimber cables.

### Silver Interconnect cables

KCAG £442.75 per metre pair inc VAT

KCTG £816.50 per metre pair inc VAT

### Silver Speaker cables

4AG £410.50 per metre inc VAT

8AG £740.50 per metre inc VAT

Custom lengths are available.

### New Product

The new Kimber RCA/Phono Plugs with a specially developed Ultra Plate contact surface rewrite the textbook! All other phono plugs sound harsh and nasty in comparison.

£22.50 per pair inc VAT

*Sole U.K. Distributor*



**Russ Andrews Turntable Accessories Limited**  
Edge Bank House, Skelsmergh, Kendal, Cumbria LA8 9AS  
Telephone: Setside (053 963) 247

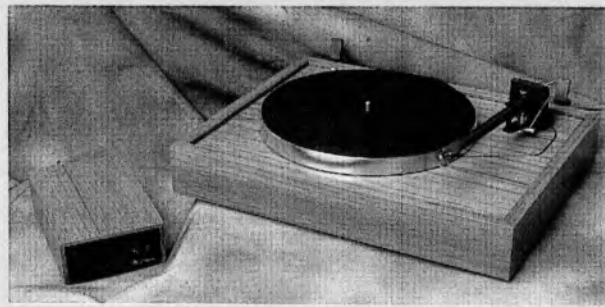
# Aylesbury Hi-Fidelity



## Stockists of:

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

## ROKSAN XERXES



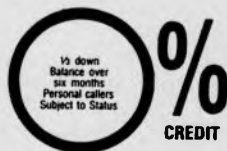
*The Reference Xerxes,  
Artimez & Shiraz on  
Permanent Demonstration*

SONY  
HI-FI NEWS  
RECORDS  
*Dealer Award* '87  
WINNER

SONY  
HI-FI NEWS  
RECORDS  
*Dealer Awards*  
1988  
NOMINEE

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

**THE REAL HI-FI SPECIALISTS IN BUCKINGHAMSHIRE**



**HI-FI MARKETS – LICENSED CREDIT BROKER**

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

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

# MARANTZ MX493AVCD

MARANTZ AUDIO (UK) LTD., 15-16 SAXON WAY IND. EST., MOOR LANE, HARMONDSWORTH, MIDDX UB7 0LW. TEL: (01) 897 6633.



Essentially this system is a cobbling together exercise between a core section consisting of an amplifier, a radio tuner and a dual cassette deck – not forgetting of course, the turntable which is very much the archetypal system record playing engine for better or worse. In effect the CD player is bolted on, having been plucked from a separates range. To this basic roll call you can add a Dolby Surround decoder/rear channel amplifier called the *SP493* – Marantz has been an enthusiastic advocate of audio/video cohabitation for some time. For the button pushers there's also an equaliser/spectrum analyser option whose model number is *EQ493*. The decoder option ties in with certain of the amplifier facilities to make the extended *MX493* into a convincingly complete looking A/V system.

One other option, always welcome with integrated systems, is the loudspeakers. Marantz supplied a pair of *LD20s*, which are excellent budget high fidelity designs in their own right, but the 'official' recommendation is the *HD483*, which weren't available in time for this report.

The *MX493* is interconnected via a patchwork quilt of ribbon cable interconnects which also eliminates much of the signal wiring. There is also some rationalisation of power leads.

## TT483 TURNTABLE

Marantz's specialisation in CD and A/V is amply demonstrated by this very ordinary semi-auto record player. Designed strictly by the book, the deck is also used in the *MX583*

system which was reviewed in Issue 65, where it was described as being structurally closer to an egg carton than a turntable. The chassis is moulded plastic and none too much of it. The lightweight metal platter is belt driven by a simple DC servo motor. The straight arm is fitted by an interchangeable *T4P* magnetic cartridge whose frequency response shape is acceptable for the type. Arm cueing is well designed and all the controls are fitted forward of the lid, which is nice. Pitch accuracy is reasonable, and drift is moderately low, despite which warbling flute tone and unsteady piano pitch sometimes make themselves apparent. The deck, which is highly microphonic and excitable, repays careful siting on a stable support.

## ST583L TUNER

Another refugee from the *MX583* system, the tuner is powered from the system amplifier and therefore its separate identity is largely a matter of appearance. Design-wise it's a modern enough product which tunes over FM, MW and LW bands and allows up to 24 transmissions to be memorised, 16 on FM and 8 on MW/LW. There are eight preset selectors, and it's not possible to freely mix FM and AM transmissions since the required waveband must always be selected first. The display is a large and clear dot matrix showing preset numbers, frequency and other status information. AM performance was unhappy, being dominated in my test set-up by quite poor interference rejection and a rather coarse sound quality. FM technical performance however, was satisfactory.

## SD583 CASSETTE DECK

This unit enjoys quite a high level of functionality, though it's important to understand that recording levels are set automatically, ruling it out as a high fidelity product, though ALC does spell convenience for the user. Consequently of course, there are no record level meters.

A twin transport design with the usual Dolby B and C noise reduction circuits, both transports are equipped for auto-reverse operation, using a rather slow witted mechanical end of tape triggering system. Only one of the two transports can be used for recording.

A wide(ish) variety of added value gadgets (most of real value in day-to-day use) include a microphone input, the signal from which can be mixed with other inputs, track skip (up to 15 tracks away from the present position can be searched for directly), track repeat, synchronised recording from CD or records, one-touch normal/high speed dub starts and sequential play. One neat touch: when dubbing, side B doesn't start recording until *both* tapes have reached the end of side A. Lab test performance is a bit too modest in respect of wow and flutter, but the frequency responses are satisfactory with well extended highs, the wobbly record/playback shape probably being caused by the ALC circuit.

## CD583 COMPACT DISC PLAYER

The *583* is a favourite of the budget component CD market, where it has a reputation



for excellence of sound, combined with simple features which don't even extend to remote control. However, in this system the bus interface allows just this, and the unit is otherwise adequately endowed with a track/index number/time display based on a dot matrix grid similar to that of the tuner. Other features include intro search (inconsistently using a different label to the equivalent feature on the cassette deck), random play, repeat and a programme memory mode. The deck employs Philips standard 16-bit 4times oversampling technology, and has a smooth acting 3-inch disc compatible player mechanism. Random track access is available on the remote handset.

## PM493 AMPLIFIER

On test power output doesn't live up to the rather fanciful numbers in the spec sheets, but it still comes out at a useful 35watts/channel. The amp fields one pair of loudspeakers (using spring terminals), phono and five other source inputs, two of which are full record/playback circuits, one labelled tape and the other VCR. The video circuits include a TV monitor input and one for CDV (or CD), each of which is equipped with video connections using phono socketry. The system allows the audio source to be selected separately from the video source if required. Other facilities include bass, treble and balance controls, partial audio muting and a headphone socket.

## LD20DMS LOUDSPEAKERS (OPTIONAL)

This is something unusual in the system's world: a genuine high fidelity loudspeaker with a solid, heavy bass reflex enclosure, a carefully designed crossover with optional split earth (three wire connections), which can lead to a slightly more articulate, better separated sound quality in an ideal system. It makes little difference here. The drive units number a small soft-dome tweeter and a polypropylene cone bass driver. The LD20s

are best used away from walls on tall, rigid stands.

## HOW IT PERFORMS

Sound quality is pretty mixed. The CD player is a truly excellent example of the breed, sounding crisp, clean and solidly three-dimensional, though more so through other systems. On FM at least, the tuner is highly acceptable, albeit in a rather undemonstrative and lightweight way, and when pitch accuracy wasn't called into question and acoustic feedback wasn't an issue, records sounded surprisingly tactile and enjoyable.

With tape, the system was clearly in some difficulties. Playing prerecorded and own made recordings alike, the sound lacked resolution and the quality of separation between instruments; bass was weak and pitch stability impaired by a fairly high rate superimposed wow artefact – producing an effect akin to warbling with sustained notes of most kinds. This makes listening something of an edge of the seat affair, even if you're not disturbed by the ruthless holding back of crescendi during loud passages. And the amplifier's role in all this? It emerges with little credit, having a somewhat sham-bolic quality when stressed and an inability to play loud convincingly without loss of clarity and frazzled high frequencies.

As for the speakers, the LD20s are logically too good for this system. They're good enough to show its limitations, but their clean, well controlled and unexaggerated nature is also a positive feature which helps reduce the severity of some of the criticisms.

## VERDICT

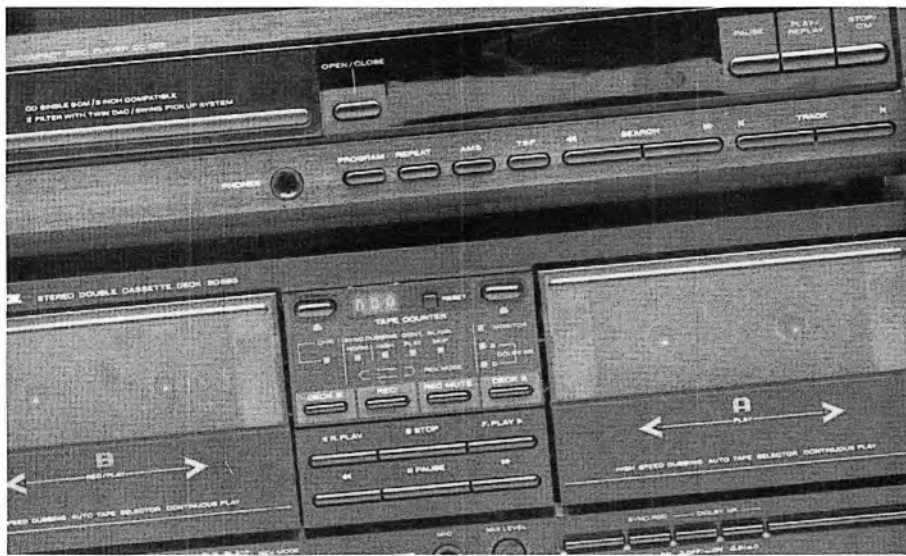
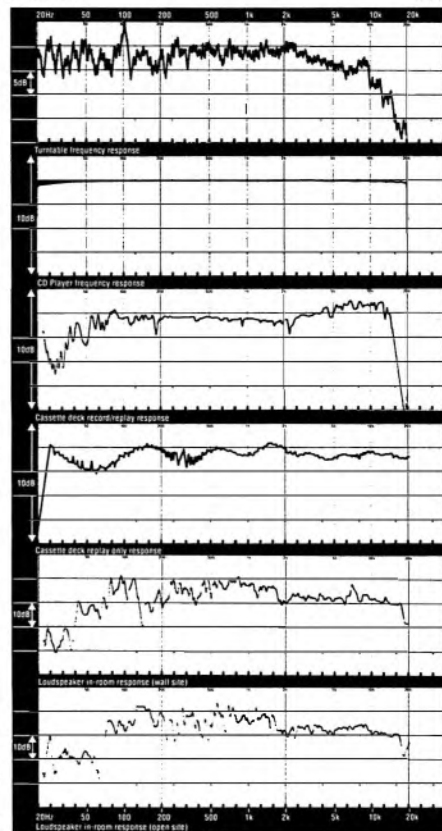
Flexibility is a strong suit, and of the components, the CD player and tuner were particularly good, and the record deck as good as expected. The ability to choose your own loudspeakers is a real strength, though ironically Marantz is one of the very few system producers who can offer genuinely fine loudspeakers of which the LD20 is an excellent

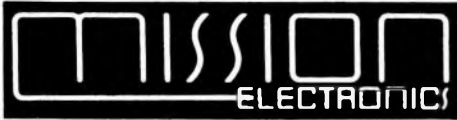
example. The AV facilities are also a strong point, and this system can hardly be faulted for versatility. On the negative side, the cassette deck is decidedly of the 'never mind the quality, feel the width' variety, and the amplifier is a mess. System design doesn't allow future upgrading of the amp without also ditching the tuner and cassette deck.

It's a close run thing, but pricing is fair and a Recommendation is in order with the LD20s.

## TEST RESULTS

Cost with speakers	£549 (LD20) without £449
Options?	SP493 AV processor/amp, MX583 programmable remote handset EQ4 equaliser
Size main unit	lid open, w/o projections 75 x 36 x 38.5cm (h x w x d) 36.5 x 23 x 26cm (h x w x d)
Size loudspeakers	
<b>TURNTABLE</b>	
Wow & flutter wtd	0.15%
Drift	good
Speed accuracy	OK
Arm/cartridge resonance	OK
( <10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	0.5dB
Cartridge channel separation	-25dB
Cartridge tracking ability	80µM
<b>TUNER</b>	
Sensitivity	good
Signal/noise	fair
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.20%
Signal/noise ref 0dB Type II	n/a*
Distortion 0dB Type II	n/a*
*auto level control	
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	>100dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms)	28/35/35watts
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	high





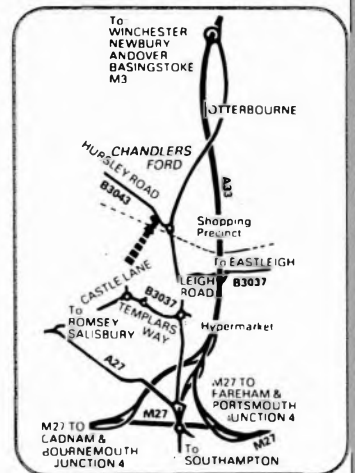
good dealer  
 good equipment  
 the foundation of a good music  
 system  
 from  
**Hampshire Audio Ltd**



**Kingfisher House**  
**2-12 Hursley Road**  
**Chandlers Ford, Hants SO5 2FU**  
**Tel: Southampton (0703) 52827 & 265232**

We stock selected items for:  
 Aloi, Audiolab, A&R, Audio Technica, B&W, Celestion, Celet, Cliff Stone, Creek, Cyrus, Denon, Dual, Gale, Goldring, Gyrodek, Heybrook, Hunt, Infinity, Jordan, KEF, Koetsu, Linn, Marantz, Mark Levinson, Maxell, Meridian, Michell, Mission, Monitor Audio, Monitor PC, Musical Fidelity, Nagaoka, Nakamichi, Ortofon, Perreaux, ProAc, QED, Quad, Revolver, Revox, Rogers, Rotel, Sennheiser, Tannoy, Target Audio, Supex, Wharfedale, and others. Active systems on demonstration.

with  
 The new **Cyrus** amps -



**OPENING HOURS**  
**TUES-SAT 10-6 THURS 10-8**  
**CLOSED MONDAYS**  
**(EXCEPT IN DECEMBER)**

# **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).*

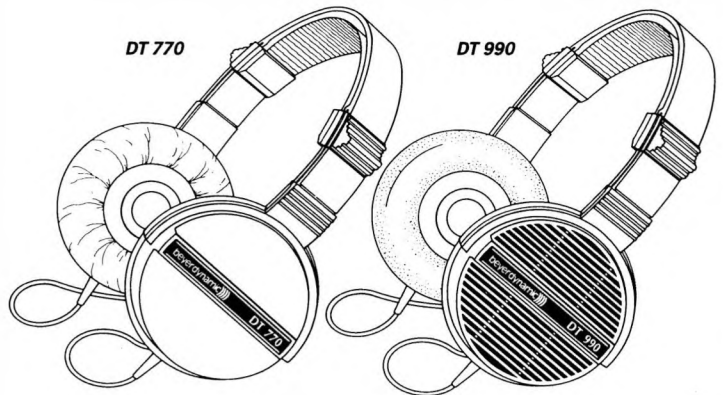
*Perhaps we could persuade you that it will go nicely with other status symbols, like your Porsche.*

*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.*



**EXCELLENCE IN SOUND**

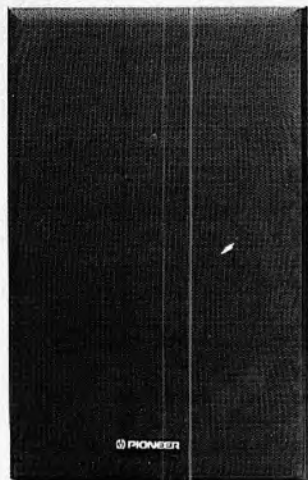
*Expensive? Yes. Worth it? Yes. Every penny.*

*Need you hear more.*



# PIONEER S-11

PIONEER HIGH FIDELITY (GB) LTD., FIELD WAY, GREENFORD, MIDDLESEX UB6 8UZ. TEL: (01) 575 5757.



This is not a system of like minded separates, but a number of separates connected satellite fashion to a central box containing the cassette deck and amplifier. The *S-11* includes all the important features expected of a modern audio system, such as automatic source selection (phono input excepted) and full remote control (again with the exception of the phono input), in this case using a small palm size handset.

System build and finish is a little below average. The plastic mouldings look quite good close up, yet the effect is somewhat grubby from a normal working distance. Perhaps one of the problems is the rather messy and cluttered panel graphics.

The system is available without a CD player if desired, or, optionally, with a multi-disc player. There are also one-piece systems where the chosen CD player is built into a single housing with the rest of the electronics. The options are called the *S-15CDM* (multi CD) or *S-15CDT* (twin CD) and cost £469.90 and £499.90 respectively, representing a significant saving over the packaging discussed here. The reason? One piece systems inclusive of a CD player sidestep the anti-dumping levy on non-EEC players which the component CD players attract.

## PL-Z82 TURNTABLE

This is an auto-return belt drive player equipped with a crudely designed pivoted arm and a fixed magnetic cartridge, of which only the stylus is replaceable. All controls are fitted forward of the lid.

To reduce LF excitability, the arm/

cartridge resonant frequency is set very high. The technique, also used by a number of Pioneer's peers, is quite effective in its own way; the cartridge cantilever low frequency resonant frequency is positioned (using arm mass to tune the system) so that very low frequencies are filtered out. However, the trade-off is that LF reproduction is spoiled, and the midband (which depends partly on the way lower frequencies are reproduced) is undermined. The general shoddiness of the mechanics are such that any form of physical interference results in momentary change in pitch. The sound becomes wobbly. Cartridge channel separation is poor and balance indifferent, whilst the frequency response shape is indicative of a low quality design.

## F-Z92L TUNER

The *F-Z92L* is probably the nearest this system offers to advanced technology. Ostensibly it's nothing more than a conventionally designed three-band tuner (FM/MW/LW) with 24 randomly assignable presets using 12 preset 'station call' buttons which are pressed once or twice to retrieve the first or second frequency stored against that preset. Unusually, the current setting of the mono/stereo switch is stored along with the frequency on FM. Stereo/mono switching is included. Electrically this is a more than adequate tuner, with low background hiss levels.

However, the tuner has certain other functions. It also acts as a system display, giving rolling read-outs of the source position or some special function just selected, even bidding you 'Hello' and 'Goodbye' when the unit

is switched on and off! Last but not least, the tuner includes a clock/timer circuit. The timer has 'sleep' and 'snooze' controls, just like your bedside clock/radio, and there's a daily timer which again can be used to help the system emulate a clock/radio, or to facilitate absentee recording.

## DC-Z72 MAIN SYSTEM UNIT

Cassettes are handled by a twin auto-reverse deck in the standard configuration, one transport only being used for recording purposes. Metal tapes cannot be used when recording. The auto-reverse mechanism is mechanically triggered at the end of the leader nearest its splice joint to the hub. Dolby B noise reduction is fitted, but not Dolby C. The deck demonstrates a strong emphasis on convenience, for example through the use of features like one touch dubbing. Two such keys are fitted, one for normal and one for the high recording speed which will dub both sides of a C90 in 45 minutes, albeit at considerable cost to sound quality.

In addition, an auto-editing feature is available which helps dump the contents of a CD so that tracks broken at the side break are rerecorded from the start on side two. What the Pioneer doesn't provide is a manual record level adjustment. On the test bench, the deck shows a fine level of adjustment for prerecorded tapes, but a very bright record/replay response with chrome (Type II) tapes. Unfortunately speed stability is rather poor.

The amplifier section is very basic. Power output checked out at 25watts/channel with



some restriction at the frequency extremes. Only one unassigned input is available: described as a video circuit, in reality it's merely a line level audio circuit which like any line input could handle the audio output of any video recorder or player. A simple five band graphic equaliser completes the list.

## PD-272T COMPACT DISC PLAYER

This is a deck for Mahler junkies. Most CD players have a single disc loading drawer, and some have multi-disc magazines – indeed Pioneer is the main producer of multi-disc players based on its six-disc cartridge design. The PD-272T (where do they dig up model designations like these?) is a kind of half-way house, being fitted with two independent disc loading trays. Advantages pointed out by the manufacturer include sequential play, and the ability to compile memory sequences (of up to 24 tracks) from two discs simultaneously, or indeed to play at random from two separate discs. Me, I welcome two drawers because it allows me to play Mahler 2, 3, 6, 8 and 9 without interruption (I have a difficulty with No 7), not to mention Brahms' *German Requiem*, Britten's *War Requiem* and so on. The play features list includes the ability to program a pause command and to halt playback when dubbing on to tape.

## LOUDSPEAKERS

Little need be said about the loudspeakers. Visually nondescript, they consist of a light-weight sealed box fitted with a large pulp cone bass unit and a largish pulp cone tweeter, though it appears to be closer to a portable radio speaker than a dedicated tweeter. The measurements indicate a restricted bass and an uneven upper midband.

## HOW IT PERFORMS

To an extent, the loudspeakers tend to dominate the sound of this system. They

sound shallow and boxy, with a falsely emphatic, spitty treble, the effects of which are shown in both speech reproduction (which tends to be tolerant of treble misbehaviour) and music. This said, the overall balance is fairly neutral. The tonal quality of different instruments is always recognisable and distinctive. The system also sounds reasonably open and lively and dynamics are not badly squashed, so the shortcomings are not as destructive as might have been supposed.

Cassette deck alignment for Type I and II tapes was good, and the deck made some surprisingly clean, accurate recordings, with TDK SA (a Type II chrome bias tape) proving particularly suitable, though a touch edgy and bright. Pitch stability was borderline. With some material it sounded very stable indeed, but the odd chamber or piano record revealed wow artefacts. However, prerecorded tapes tended to reproduce well.

Record reproduction was very poor. The treble had a thin, whistly quality and lacked presence, imagery and solidity. The engineering of the vertical arm bearings was so abysmal that I literally had to press the cartridge down on to the record before the cartridge consented to stay in the groove, and the deck was unusable if there was any substantial warping. Off air, AM reception quality was quite good, and sound quality was acceptable, though lacking in treble and 'air'. FM performance is good, subject only to some brightness and thinness.

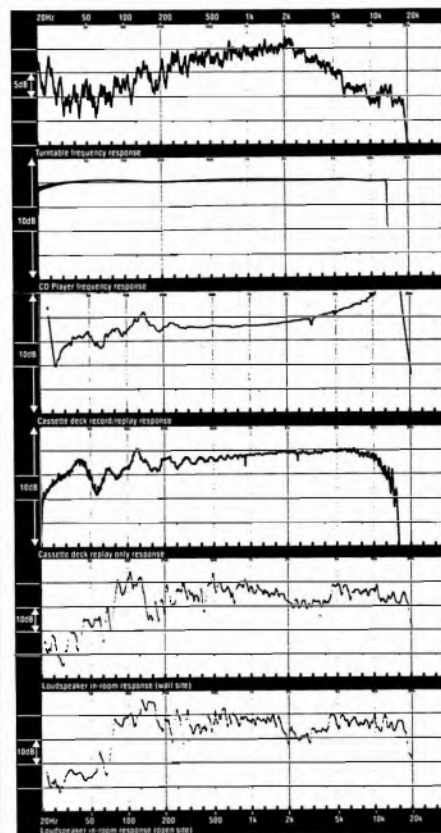
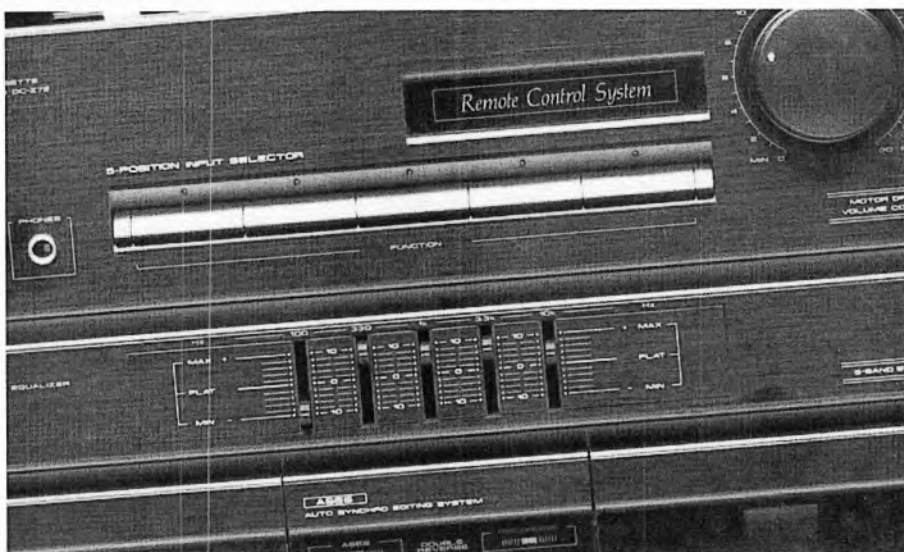
## VERDICT

Record reproduction is a dead loss with this system, so it cannot be recommended to anyone for whom this is important, or who has any substantial number of records. The rest of the system is of acceptable standard. There are some useful features, primarily the timer, and the straightforward control system helps make up for the rather messy appearance. No formal recommendation then, but this system should be considered

favourably if records are not an issue.

## TEST RESULTS

Cost with speakers	£510; without £330
Options?	multidisc CD player £220. Also see introduction
Size main unit	76 x 36 x 38cm (h x w x d) 42.5 x 26 x 20cm (h x w x d)
Size loudspeakers	
<b>TURNTABLE</b>	
Wow & flutter wtd	0.17%
Drift	medium
Speed accuracy	+0.9%
Arm/cartridge resonance	too high
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	0.8dB
Cartridge channel separation	-18dB
Cartridge tracking ability	80µm
<b>TUNER</b>	
Sensitivity	good
Signal/noise	good
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.21%
Signal/noise ref 0dB Type II	n/a*
Distortion 0dB Type II	n/a*
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	60dB
<b>AMPLIFIER</b>	
Power output/channel (Bohms)	15/25/22watts
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	high



*Your invitation to visit . . .*



## The most comprehensive selection of Hi-Fi in the North West

Visit BEAVER HI-FI and view our permanent exhibition of brand-name 'state of the art' equipment.

Probably the widest range of HI-FI exhibits in the country are available at the touch of a button via our extensive comparator system; it gives millions of component permutations, enabling you to hear your individual choice of system. A private listening studio is also at your disposal.

Our staff, with a combined total of over 80 years experience in the trade, will be more than happy to help you in your quest to find your 'ideal sound'.

The venue for this exhibition – in the centre of LIVERPOOL – is the best of its kind. We have just finished our latest complete rebuild in order to project our store firmly into the nineties.

And not only is this probably the biggest exhibition you will ever visit, but also the longest running, having been established 57 years ago. How can you refuse an invitation like this?



■ HUNDREDS OF SYSTEMS PERMANENTLY ON DISPLAY

■ ALL THE MAJOR MANUFACTURERS REPRESENTED

■ HELPFUL STAFF WHO KNOW WHAT THEY'RE TALKING ABOUT

■ LOWEST PRICES GUARANTEED

■ DEMONSTRATION ROOMS

■ PART-EXCHANGE WELCOME

■ COMPARATOR DEMONSTRATIONS

■ OPEN 6 DAYS 9.30-5.30

■ CREDIT ARRANGED

# BEAVER

## HI-FI

20-22 Whitechapel  
Liverpool L1 6EH  
Tel: 051-709 9898  
Fax: 051-708 7105



Licensed Credit Brokers



# ALTERNATIVE AUDIO

PRESENT THE ROKSAN SERIES OF PRODUCTS



XERXES ARTEMIZ SHIRAZ HOTCAKES



## On Permanent Demonstration

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

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



## ALTERNATIVE AUDIO LTD.

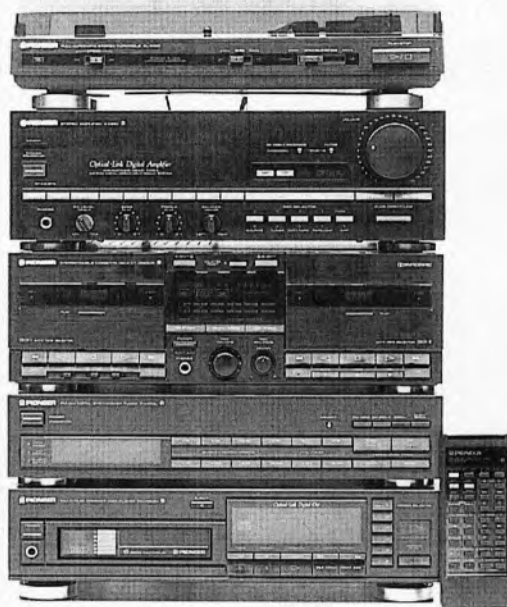
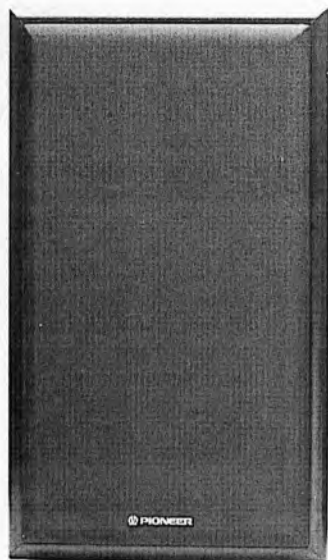
93-95 Hobs Moat Road,  
Solihull,  
West Midlands B92 8JL.  
SALES: 021 742 0254  
SERVICE: 021 742 0248

Demonstrations by Appointment. Open Tues-Sat 10.00 - 6.00  
Licensed Credit Broker, Written Details on Request



# PIONEER S-330D

PIONEER HIGH FIDELITY (GB) LTD., FIELD WAY, GREENFORD, MIDDLESEX UB6 8UZ. TEL: (01) 575 5757.



Ergonomics of this costly system are best described as reasonable, but as you might expect hampered by the sheer range and depth of on-board gadgetry. As is so often the case, the remote control handset is the great leveller, and although little has been done to make the handset particularly ergonomic, at least the number of buttons is reasonably restrained – there are 35 – whilst lacking nothing of importance. The control system is capable of synchronised recording.

Pioneer has fitted a non-scanning central control microprocessor which is electrically quiescent until a command is issued. This reduces the amount of stray RF caused by the processor's clock which normally ticks in the megahertz region, spilling RF all around, which is a known if subtle cause of musical loss. The multi-play CD player included with this system is optional, and can be replaced by a single play unit if required – or none at all.

## PL-X350 TURNTABLE

The *PL-X350* is one of the very few system turntables, in this project at least, which shows any signs of having been engineered to anything other than the lowest possible standards. But don't take this as a ringing endorsement. The player is still light years behind the standards attained even by quite modest hi-fi turntables in the £100 region.

The arm is fitted with a *T4P* fit interchangeable cartridge with a pretty accurate wide-band response, plus good tracking and channel balance, though separation is asymmetric (the figure given is the average of L-R

and R-L) and in any case not very good. Some mechanical coupling effect is clearly at play around 100Hz, but otherwise the deck is quite effectively isolated by four compliant feet. Any residual noise and bumps are translated into changes in linear velocity of the platter, with the effect that pitch integrity goes to pot. Belt driven like most of its ilk, the *PL-X350* is fully automatic, with all controls clustered on the front panel. Wow and flutter is low when used on an undisturbed, rigid support, but can be poor otherwise.

## F-X450L TUNER

If Pioneer's latter day reputation can be said to have been based on any one product group, it is tuners, where Pioneer has done much to advance the state of the art. This *F-X450L* shows some of the fruits of those efforts with features such as CCTS (Computer Controlled Tuning System), a type of servo which precisely tunes the required station already 'roughly' tuned by the synthesiser circuitry, and a 'silent servo' circuit which acts analogously to the non-scanning microprocessor described in the introduction. The only trade-off I found was increased 'thinking' time when tuning. The presets remember the status of the stereo/mono switch, along with AM servo and FM silent servo switching. There are 24 random presets for use on the usual three wavebands, two presets being stored per preset key.

## CT-X550WR CASSETTE DECK

A high spec unit, this twin auto-reverse model is one of the relatively few midi-system

cassette decks with Dolby C as well as Dolby B, and one of the tiny number with Dolby HX Pro, which in case you haven't encountered is a circuit which varies record bias in-line with the music in such a way that high frequency dynamics and headroom are improved. The system is at its most effective with ferric and (to a lesser extent) chrome group tapes, which are the ones that need the most help.

Only one of the two transports records, and the end of side changeover mechanism is not optically triggered, and only operates at the far (wrong) end of the leader. The tape counter is an almost invisible mechanical device which works on the record transport only. Otherwise it's good news all the way. Record level setting is manual (there are record level meters to assist of course), a track search device can search up and down the tape, skipping up to 15 tracks in either direction. The deck has measured frequency responses which are a couple of dB over the top, but the other numbers, including the all-important wow and flutter, are first class.

## PD-X950M COMPACT DISC PLAYER

When Pioneer first launched its multi-disc CD player, I was quick to see the potential for in-car entertainment, but was sceptical of its chances in the domestic environment. I was wrong. It seems that the public has taken to multi-disc players in a big way. Pioneer is a market leader, and its six-disc cartridge is the most popular. The player exploits the six-disc capacity with a 32-track programme



memory, with each step assignable to any of the six discs. The track currently playing can be programmed with a single press of one command key, and tracks can be played in random order. Although a standard analogue output is fitted, the system is designed for optical transmission, suitable sockets being fitted both to the player and to the amplifier.

## S-X550 AMPLIFIER & S-X550 LOUDSPEAKERS

The amplifier is quite a powerhouse. It pushes out 70watts/channel across the full audio bandwidth of 20Hz-20kHz and has a built in 8 times oversampling digital converter capable of handling CD in the digital domain. Pioneer hasn't indulged itself with useless gadgetry such as graphic equalisers, but neither is there a shortage of inputs, these including spare tape and auxiliary circuits, and a patch allowing a signal processor or equaliser to be added. The signal fed to the tape output can be selected independently of the listen-only source selector, or simply be left switched to 'source'. Various 'straight line' switches are provided.

Turning finally to the *S-X550* loudspeakers, we see one of the closest approaches in this project to a genuine high fidelity loudspeaker built to traditional hi-fi standards. A large system suitable for use on open stands, it contains three drive units: a bass unit, a large dome tweeter and a small dome super tweeter. It's hard to see the advantage of using two tweeters, and only too easy to picture the disadvantages, in particular the practical impossibility of blending two high frequency drive units. The fact that they are laterally offset, and that the speakers are not disposed symmetrically introduces another class of compromise. Yet the enclosure is solid (and attractive courtesy of the smoothly rounded edges) and the drive units and crossover alike are made to a fine standard, though the speaker wire terminals (suitable for bared cables only) are shoddy.

The measured performance looks favourable, albeit with a suggestion of a low frequency resonance.

## HOW IT PERFORMS

My initial feeling was that the system sounded a little too well upholstered down low, and although incisive it is quite coloured at higher frequencies. Dynamics definitely came across flattened, and the sound system failed to exploit the stereo medium adequately. It has a rather close, constrained style of presentation.

Much of this can be laid at the loudspeakers' door which, despite their good build quality, let the system down miserably. The bloated bass quality is quite unmistakable, and is certainly severe enough to suggest that it was designed in rather than being there in error. Happily, the rest of the system is very much better. The tuner and CD player can be pitched against most comparably priced hi-fi separates, the tuner being exceptionally clean and dynamic on FM and also clearer and quieter than usual on AM. The CD player is not in the budget Philips/Marantz class, but few others are either, and it does work well. Most of the time, even the record player sounded presentable and the amplifier had a strong, articulate feel, though in extremis it tended to sound a tad lazy, the loudspeakers aiding and abetting.

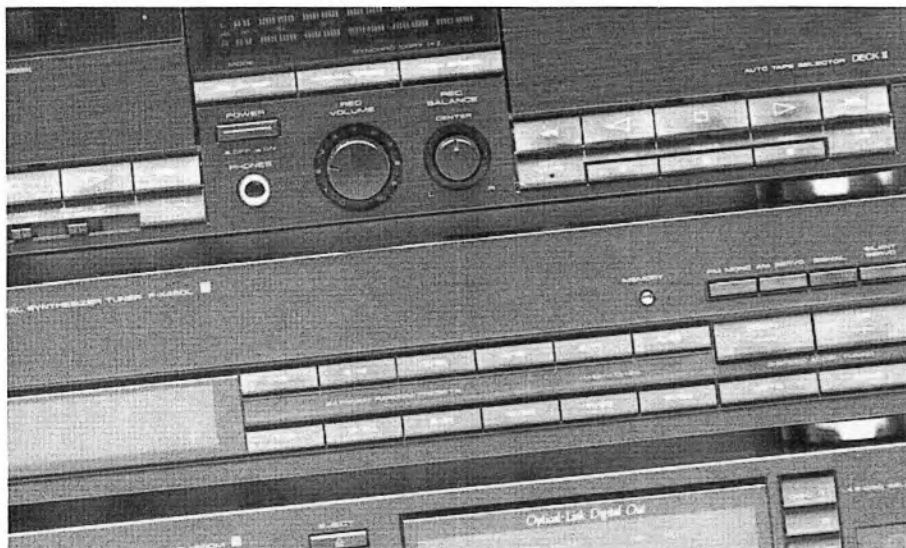
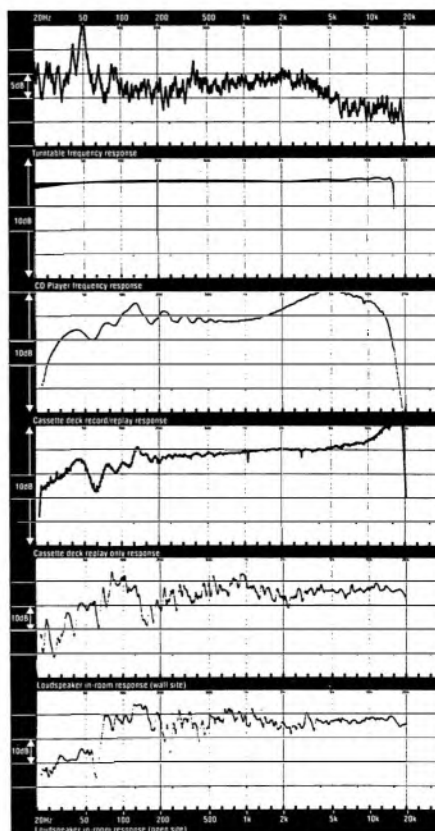
I have several complaints concerning the tape deck. It's hard to read the tape counter or see the tape running. The deck is slick in operation, and on the whole it also sounds excellent, being at once stable, quiet, dynamic and expressive. However, Dolby pumping (random fluctuations in level - imagine that the microphones were placed on a springboard with someone bouncing on the business end) is more than merely obvious with most tapes when using Dolby C. All in all, it's no match for the tuner or CD player, but it leaves most system decks, even those supplied with some quite expensive systems, standing.

## VERDICT

Most of the listening was performed with the reference Wharfedale speakers, and I'd recommend any potential purchaser to budget for decent speakers. Allow £150 upwards for speakers *and stands*. Don't forget the stands. This caveat registered, a formal Recommendation is mandatory for the electronics, but I'd like to see Pioneer tighten up the cassette deck alignment.

## TEST RESULTS

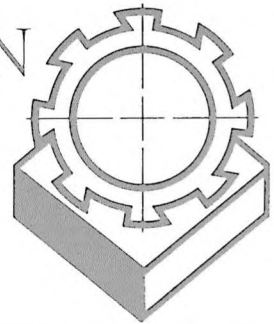
Cost with speakers	£1,080; without £800
Options?	PD-X550 single play CD player £230, GR-X550 graphic equaliser £160
Size main unit	lid open, w/o projections 78 x 36 x 38cm (h x w x d) 48 x 28 x 28cm (h x w x d)
Size loudspeakers	
<b>TURNTABLE</b>	
Wow & flutter wtd	0.12%
Drift	good
Speed accuracy	+0.3%
Arm/cartridge resonance	OK
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	0.5dB
Cartridge channel separation	-25dB
Cartridge tracking ability	80µM
<b>TUNER</b>	
Sensitivity	very good
Signal/noise	very good
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.10%
Signal/noise ref 0dB Type II	83dB
Distortion 0dB Type II	0.45%
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	93dB
<b>AMPLIFIER</b>	
Power output/channel (Bohms)	70/80/70watts
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	medium



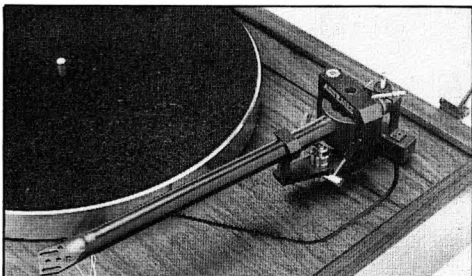
# AERCO

# ROKSAN

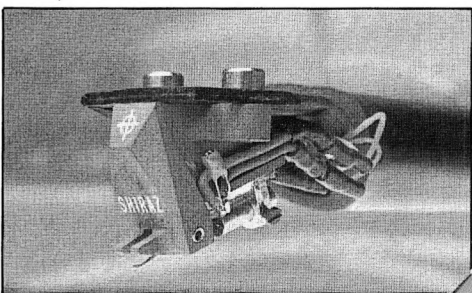
Audio EST. 1945



## XERXES



## ARTEMIZ



## SHIRAZ

WHAT DO THE REVIEWERS THINK? . . .

“. . . Right from the start it was obvious that the turntable imparted outstanding solidity and security to the sound of the record being reproduced. Stereo information was wide and stable, with precise location of images . . . The Xerxes has a very open and neutral balance, and its poise and stability make it sound less like a turntable than most . . . Above all, what I like about Xerxes/Artimez/Shiraz front end is the way it gives you a solid, focused sound without the impression that the music is in a straitjacket . . . I think this Roksan combination is unquestionably the best sounding turntable/arm/cartridge package from a single manufacturer.”

*Jimmy Hughes – Hi-Fi Answers October 1989*

WHAT DO WE THINK? . . .

QUITE SIMPLY THE BEST

WHAT WILL YOU THINK? . . .

HEARING IS BELIEVING

EXPERIENCE THE REAL THING . . .

- ★ 2 DEMONSTRATION STUDIOS
- ★ A MEMBER OF THE BRITISH AUDIO DEALERS ASSOCIATION
- ★ MINIMUM 2 YEAR GUARANTEE
- ★ FREE DELIVERY AND INSTALLATION
- ★ HOME DEMONSTRATIONS

- ★ ALL MAJOR CREDIT CARDS
- ★ INSTANT CREDIT UP TO £1,500
- ★ PART EXCHANGE WELCOME
- ★ FREE COFFEE

**AERCO AUDIO**

11 The Broadway,  
WOKING

Surrey GU21 5AP

Tel: Woking (04862) 4667

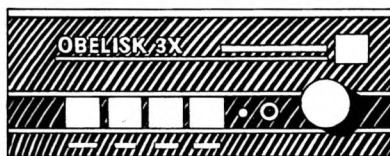
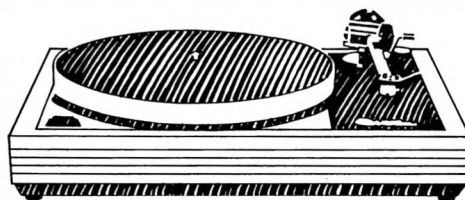
Agencies include:- ROKSAN \* EXPOSURE \* ION \* ALPHASON \* ROYD \* SYSTEMDEK \* ROTEL \* ACOUSTICRESEARCH \* A&R \* MANTICORE \* KEF \* NAKAMICHI \* MARANTZ \* PROTON \* NAD \* B&W \* ARISTON \* THORENS \* ORELL \* CASTLE \* ORACLE \* BRYSTON \* HARMAN KARDON \* MONITOR AUDIO \* INFINITY \* QED \* DYNALAB \* REVOX \* BOSE

A WIDE RANGE OF ACCESSORIES AND STANDS ALWAYS AVAILABLE

**BADA**  
THE ULTIMATE IN  
SOUND ADVICE

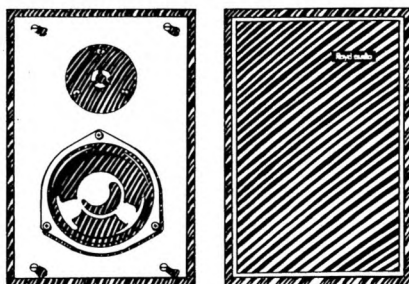
# HOW MUCH MONEY WILL YOU SPEND ON HI-FI BEFORE YOU HEAR THE MUSIC?

We don't wish to worry you, but had you realized just how many audio components there are around that will never really let you hear the music, no matter how many naughts they have on their price tags.

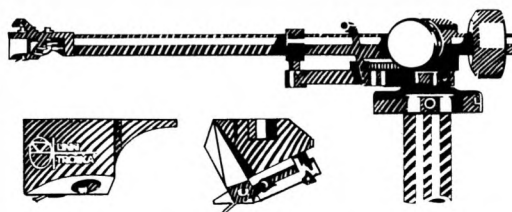


At Chris Brooks Audio, we work by one simple rule: if it doesn't play music we won't sell it!

That means that any music system or component you buy from us, at whatever price point, will always satisfy this fundamental requirement.

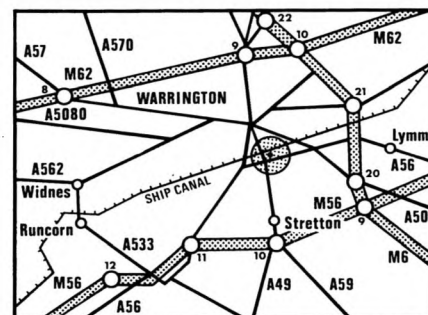


It also means that when you choose from our carefully selected range of quality hi-fi, you'll be able to hear exactly why Charlie Parker is regarded as a genius or Miles Davis such an innovator. Why Itzhak Perlman is a master of the classical violin. You'll be able to hear the skill of John Williams, the soul of Bobby



Womack, musical ideas, emotions and techniques.

If these things are important to you, then why not call and talk to us. Book a demonstration in one of our three studios; we're conveniently situated close to the motorway network. Bring some of your favourite music; relax and listen.



If you decide to make a purchase, it will be properly installed for you free of charge if required, covered by our 2 year parts and labour guarantee and backed by our in house servicing facility.

Most of all however, you'll have the means to enjoy music, pure and simple.



CHRIS BROOKS AUDIO, 29 GASKELL ST., STOCKTON HEATH, WARRINGTON, CHESHIRE. TELEPHONE: 0925 61212.

LINN ▶ EXPOSURE ▶ REGA ▶ ROKSAN ▶ ION SYSTEMS ▶ ROYD ▶ CREEK ▶ A & R CAMBRIDGE  
▶ BEYER ▶ AKG ▶ SENNHEISER ▶ AUDIO TECHNICA ▶ QED ▶ DUAL ▶ P.W.B.

Open 10am to 6pm, Tuesday to Saturday. All major credit cards accepted. Credit terms available, written details on request.

# SHARP CD-X17E

SHARP ELECTRONICS (UK) LTD., SHARP HOUSE, THORP ROAD, MANCHESTER M10 9BE. TEL: (061) 205 2333.



The *CD-X17E* (and also the Yamaha *AST-C30*, reviewed separately) explores a new path that lies between the worlds of the midi system and ghetto blaster. In principle the Sharp (and equivalents) achieves the best of both worlds. It is compact, with major dimensions barely different to many up-market ghetto blasters. Compactness has been achieved in part by dropping the turntable, and partly also by the unique Sharp dual cassette deck design in which the two tapes are placed one in front of the other. But the provision of features and the standard of under the skin engineering is entirely typical of a conventional midi system.

In the Sharp's case the parallel should be drawn with quite an expensive midi system since at £550 it's expensive. To an extent I can see where the money has gone, but at the end of the day you're undoubtedly being asked to pay over the odds for the unit's compactness.

Although it looks like a portable, and indeed the loudspeakers can be clipped to each side of the unit allowing it to be carried with two grab handles on the top surface, it cannot be run from batteries. This is a mains powered machine with no battery option. It's pretty heavy too, tipping the scales at around 14.5kg – over 31lb in old money – and is therefore best seen as a luggable, to borrow a word from the computer industry. This kind of system is well adapted to life in digs or a bedsit, or where transportability between home and office (say) is desirable.

Considerable thought seems to have gone into this system, and at first sight the control

system is a joy. Yet I kept stumbling with this system as I was perpetually looking for this control or that. Nothing ever seemed to be quite where I expected, or to work in the way that seemed logical. I was also annoyed by details, like the inane flashing power level display, which in my view is no more than a species of visual vandalism. It can't be switched off. Happily, practice probably *will* make perfect, and there's always the 35-key full function remote control.

## MAIN SYSTEM UNIT

The main system unit is built like a miniaturised midi system, down to the compartmentalisation of the various functional elements of the design by deep feature lines on the front panel. Of course the division is more apparent than real.

The CD player is the centrepiece of this design – almost literally. Pressing the 'open' key causes the top section of the player with the display panel built into the front to raise, like the opening of a crocodile's mouth. This is followed by the thrusting of the disc loading drawer, in a doubtless conscious parody of a monstrous tongue. The symbolism of the swallowing of the disc when 'play' is selected is unmistakable, and I'd guess this feature alone will sell as many of this model for Sharp as any other feature.

The deck is equipped with a high grade display incorporating a calendar style available track read-out, plus simultaneous numerical track, time and function read-outs. Various time options can be selected using a front panel switch. A matching ran-

dom access track keypad is also fitted, alongside repeat, programming and track skip keys. They are repeated on the remote handset, which is also sole repository of the two fast cueing keys.

The tuner section is a full three-band synthesiser affair with 20 FM and 10 AM (MW/LW) presets which can be accessed sequentially using the player's controls, or with the random access keypad that also accesses CD tracks on the remote control handset. The tuner has a standard 75ohm coax aerial input for FM, and a loop aerial for AM, but unfortunately there is no mono switch. However, I experienced no reception or noise problems on FM on anything but the weakest signals, although I wouldn't buy this system for its AM performance, which was pedestrian at best.

As has already been noted, the cassette deck is unique in its use of a space saving 'back to back' mechanism in which extended spindles can take two cassettes, one behind the other. The facilities are pretty standard, except perhaps for the use of just one set of light touch, logic controlled transport keys for both tapes, assignable as required. There are limitations, which prevent one tape from being used when the other is already playing, and by definition inhibits the removal or entry of a tape into either transport when the other is doing anything. However, the standard linked operating modes, sequential play and dubbing at normal or double speed, are available as usual. Both transports are auto-reverse capable, and as is usual, only one records. Metal tapes are not compatible for



recording purposes, and tape type switching for the other two groups is manual. Dolby B is included though, and so too is a track search feature.

Finally, the amplifier section delivers a useful 15watt/channel via a four band 'graphic equaliser' (sic) and an extra-bass switch (X-bass). A rudimentary (ie useless) surround sound facility is included. Additional socketry includes an auxiliary input and for reasons best known to the maker, a CD only output. The system has a clock with sleep and wake-up timers. The latter can be used to make unattended recordings.

On the whole lab test results are fair. I was impressed by the tape deck record/replay response (though the playback only response is very odd – see plot), but the CD response measured at the CD output was bass heavy, which appears to be a deliberate artifice. Tape speed integrity is borderline, some rapid wow artefacts being audible with some material.

## CP-X17E LOUDSPEAKERS

As befits the nature of the system, the CP-X17E speakers are small, but they're cunningly designed and built. The carcass is a wrap around wood sleeve into which the baffle band back has been dropped, and which is lined with sound absorbent material. One intriguing feature is the faceted external design. The overall plastic mouldings and a stiff wire baffle cover make it all look good.

The electrical design is based on two drive units, a cone pulp bass driver and a cone pulp tweeter with a sexy looking metal centre cap which gleams dully through the baffle. On the back is another bass unit, this time not driven by the amplifier. This passive unit 'drones' in sympathy at certain low frequencies in a configuration popularly known as the 'drone cone' or 'flapping baffle', but is more correctly described as an ABR – Auxiliary Bass Radiator. Its modus operandi is analogous to the port on a reflex loudspeaker.

The frequency response shape is a little

uneven through the bass and midband, and smooth through the treble up to just short of 20kHz, where there appears to be a sharp tweeter resonance. Bass depth, which extends down to 100Hz before dying rapidly away in a manner typical of ABRs is good, though not exceptional for the size.

## HOW IT PERFORMS

As the Sharp system straddles the worlds of midi and portable audio, so does its standard of music making. Good as the electronics (mostly) are, there are intrinsic constraints caused by lack of design integrity in the amplifier and loudspeakers which have nothing to do with any lack of cubic inches.

In the case of the loudspeakers at least, it isn't necessary to make any allowances for size. I found the Sharp gave a big boned, large scale account of the music it was fed. Positioning the loudspeakers just forward of a wall, or alternatively away from walls but on a large reflecting surface such as a table or deep bookshelf, seemed optimum for this system, and gave a gratifying sense of bass depth and weight, and quite a good sense of stereo focus to match.

Ironically, the problem with this miniature system had nothing to do with bass, but concerned the upper midband and treble – the subtlety, detail and tonal colour band if you like (this isn't the literal truth of course...). The speakers, ably assisted by the bag of transistors that perform the task of signal amplification, sounded dulled and constrained in this region. The result was a drying out of tonal colour, understated dynamics, lazy sounding, slurred percussion playing and a simple lack of detail.

There were also occasional losses of pitch accuracy with the cassette deck, as usual affecting instruments like piano and woodwind worse than most others. Had it not been for this, I would have had little to complain of from a system that seemed capable of excellent results on all three sources. It's true that the CD player always sounded a

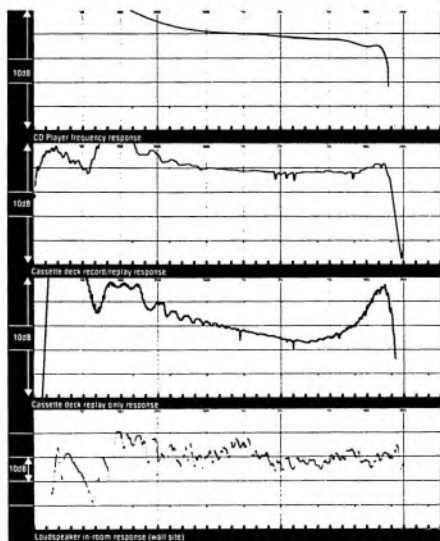
little more open, refined and explicit than the cassette deck, but the difference wasn't huge, especially through the system loudspeakers.

## VERDICT

As you can see, the Sharp represents a sincere attempt to be all things to all people, and not unnaturally it's only a partial success. Cassette deck stability is a practical limitation in this system, and so is the mid and top end performance in the ways already described. On the whole this is a high quality system that does its job well, but the Yamaha *AST-C30* is not to be ignored in this context, and neither is the very high asking price.

## TEST RESULTS

Cost with speakers	£550; without n/a
Options?	none
Size main unit	lid open, w/o projections 27 x 29 x 29cm (h x w x d) 26 x 18 x 22cm (h x w x d)
Size loudspeakers	
TUNER	
Sensitivity	good
Signal/noise	fair
CASSETTE DECK	
Wow & Flutter (wtd)	0.20%
Signal/noise ref 0dB Type II	n/a*
Distortion 0dB Type II	n/a*
COMPACT DISC PLAYER	
Signal/noise (measured at amp Tape Output)	91dB
AMPLIFIER	
Power output/channel (8ohms)	15/15/17watts
(20Hz, 1kHz, 20kHz both channels driven)	
LOUDSPEAKERS	
Efficiency	low



# SANYO 39CD

SANYO MARUBENI (UK) LTD., SANYO HOUSE, OTTERSPOOL WAY, WATFORD, HERTS. TEL: (0923) 246363.



This review is devoted to the least costly of three new systems from Sanyo. As tested, it will set you back £260, a price that also includes three compilation CDs. In passing it's worth noting that this is just £40 less than the next model up-range, the 49CD, which is substantially better equipped.

Previous Sanyo low-end designs have tended to offer a poor standard of finish and tacky styling, but the Sanyo 39CD, and indeed the range of which it is a part, are a genuine improvement. With more than a nod in the direction of recent Sony practice, the system has smoothly rounded contours, an attractive dark grey matt plastic finish and truly excellent control organisation. This is one for granny. Remarkably however, there isn't even a remote control with this very basic one-box (plus CD) system.

## DCX39 MAIN SYSTEM UNIT

'Total music power of 26watts' screams the headlines on the display flash that was attached to one of the loudspeakers. The glossy brochure was slightly more circumspect - '12.5watts total music power' it screamed, a figure sort of consistent with the measured 5watts/channel, or 3watts at a probably academic 20Hz. This gynormous power is funneled to the loudspeakers via a graphic equaliser with five bands centred on 100Hz, 400Hz, 1kHz, 4kHz and 12kHz, which you'll notice completely avoids the deep bass and extreme treble, which is one of the few legitimate excuses for equalisers in the first place. In fact the tuning of the individual bands was clearly very broad and displayed

considerable overlap, neither was it possible to do much that ordinary tone controls don't do just as effectively.

The individual source components are also pretty basic, this of course being the hallmark of the system as a whole. Take the record player (*please take the record player . . .*) which is an all-plastic belt-driven confection, with - as far as I tell - a ceramic cartridge. The player has an auto-return arm mechanism. The platter itself appears to be sprung, though whether deliberately (without coupling to the arm base!?) or inadvertently as a result of a design shortcoming is hard to ascertain. It's even harder to tell whether the environmental decoupling it provides overrides the damage that decoupling the cartridge from the record does in introducing read errors. What we can say is that wow and flutter is high, and the cartridge frequency response abysmal, and incidentally is the best clue that the Sanyo indeed has a ceramic cartridge since ceramics *that are incorrectly loaded* generally end up behaving like this one. The other tests could not be run because of the nature of the system.

Of course the cassette deck section has two mechanisms, both of which are unidirectional and one of which is only suitable for playing tapes back. Naturally the Sanyo is capable of sequential play and both normal and double speed tape to tape dubbing. The transport controls are non-logic controlled and entirely manually actuated, though control feel is surprisingly good. A solitary mechanical tape counter is connected to the

record capable transport, and tape selection is manual - and incidentally excludes metal (Type IV) tape stock when recording. Record levels are set automatically, and there is no Dolby (or any other) noise reduction system. In common with the turntable, some of the tests could not be run, but those that could speak of poor but not disastrous wow and flutter, a playback response shape with a modest treble loss, and a rather uneven record/playback response with Type II (chrome bias) tape, the output dipping in the 2kHz region before rising to a +3dB peak at 8kHz.

The tuner is one of that now immensely endangered species, the analogue or dial and pointer tuner. It works on LW, MW and FM as usual and is manually tuned with a light to show when it's on station, and (it must be said) at most other times, too. The only other feature is a stereo/mono switch. There is no provision for an external AM aerial but the FM aerial provision is a standard 75ohm coaxial socket. FM reception quality is quite good, both with respect to noise and (to a lesser extent) rejection of unwanted signals. However, AM performance is flat, lifeless and often interference bound.

## CP59 COMPACT DISC PLAYER

This unit is shared by all three Sanyo systems tested, and unfortunately is very poor indeed. Altogether there are eight control keys, and this total includes the mains switch. Dual function skip/audible search keys control both these important functions, track skip being selected by tapping the keys, and audi-

ble search by holding the appropriate key down. The display has just two large red digits, and in the normal course of events it reads out the current track numbers. But in a compromise that has been forced on the designers by the cheapskate decision to use just two display digits, during cueing operations the display shows the *units* of minutes and the *tens* digit of seconds with a '.' separator. Thus ten minutes, 59 seconds would be displayed as 0.5!

Other facilities include a 16-track random programme memory, pause and repeat. The player is compatible with 8cm CD singles, and has a standard analogue output only. Disc handling is relatively fast and tracking is assured, and environmental isolation improved to a degree by compliant feet.

Signal/noise, which of necessity was measured at the system headphone socket with the volume set to around 12 o'clock, is lower than most, though much of the excess can be blamed on the amplifier and not the CD player. The frequency response shape is also significantly in error at high frequencies, evidently due to the rough and ready design of the brickwall anti-aliasing filters.

## SX39 LOUSPEAKERS

I'm not in a position to tell you much about these speakers. They are well protected from prying eyes by a construction that threatens irreversible damage if anything is undone. Certainly the enclosure is fairly light, though it's neither as flimsy nor as resonant as some of its peers. There appear to be two drive units, and a tactile examination through the grille cloth suggests that the tweeter hole is indeed plugged by something that feels just like a tweeter. But there's no output from this unit at all. Everything comes from the main bass driver, and indeed the frequency response shape, which is pretty rough in character, shows an average 7-10dB loss in output in the 10-20kHz range (ref 1kHz). It also shows the bass output extending down to 100Hz, which isn't bad for a system loud-

speaker, before switching off abruptly.

## HOW IT PERFORMS

Record reproduction is saved from the brink of disaster by the unit's inability to reproduce bass at all, and by a surprising imperturbability to external shock. The lack of bass means that the unit doesn't drone like many cheap decks do, and also helps by making the sound sharper and clearer than it would otherwise be. At its best with, for example, piano and voice, the game is up as soon as an orchestra or rock band is asked to play.

The tape deck is almost as satisfactory. It makes tolerable sounding recordings of what might be described as entertainment quality, but lack of pitch integrity sets the limits, and prerecorded tapes tend to sound inconsistent and confused due to the lack of Dolby decoding.

The AM section of the radio tuner is easily outperformed by a decent quality portable radio. FM, however, is surprisingly good. The Sanyo is capable of clear, articulate reception.

Rising head and shoulders above all the other sources is the CD player, though it sounds perceptibly synthetic and grainy when inserted into a high grade hi-fi system. The amplifier is clear and clean in a slightly threadbare way, and the highly sensitive loudspeakers help make the most of the limited available amplifier power. Qualitatively however, they leave a lot to be desired. They have a peculiarly colourless quality in which tonal colours are compressed, and spatial cues are subjugated to a hardness and phasiness that can make listening unpleasant. The lack of treble, and what appears to be some HF resonances in the single operational drive unit, is certainly responsible.

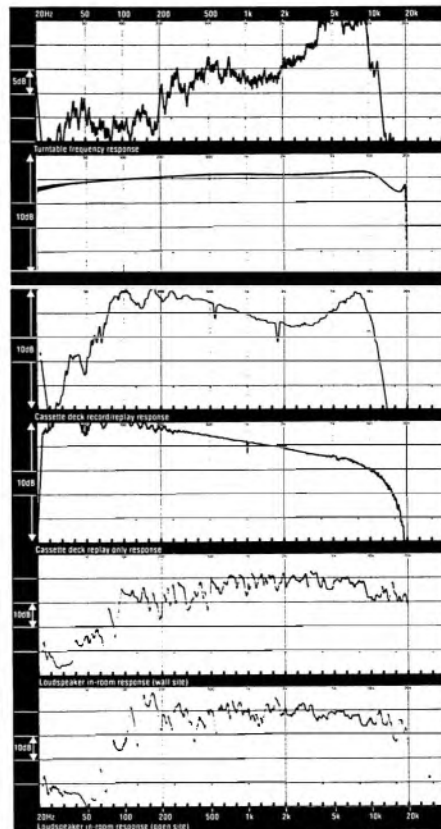
## VERDICT

It's hard to evaluate this system meaningfully. It is attractive and clean in presentation, and remarkably easy to get to grips with, partly of course, because there are so few

facilities on offer. Sound quality is no great shakes in a variety of ways as has already been explained, yet the system doesn't trip up too badly, and most of the compromises are supportable when judged against the price ticket. The system might even have qualified as a borderline recommendation, but the 49CD is significantly better at relatively little extra cost, and this I think leaves this system high and dry.

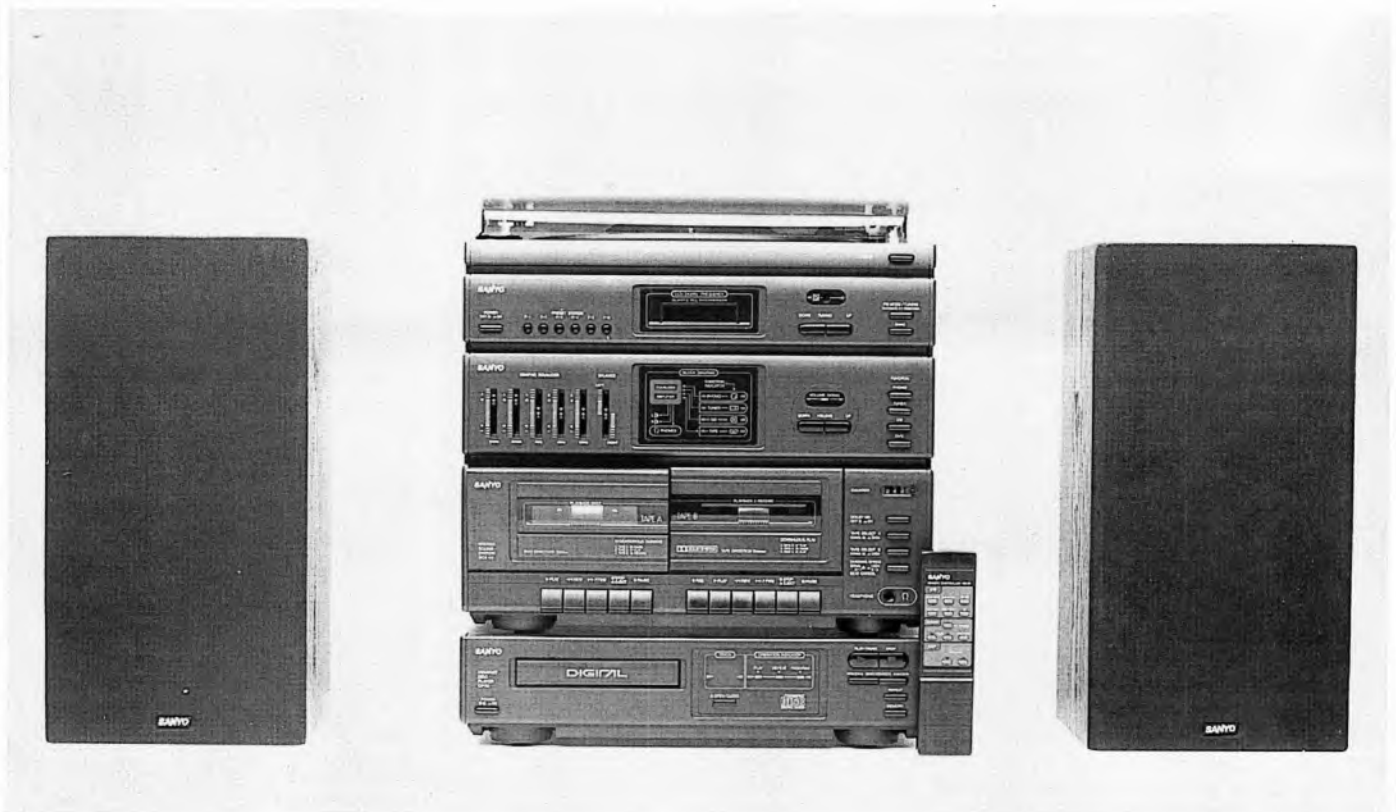
## TEST RESULTS

Cost with speakers	£260; without n/a
Options?	CD player
Size main unit	lid open, w/o projections 61.5 x 36 x 37cm (h x w x d) 40 x 20 x 18cm (h x w x d)
Size loudspeakers	
TURNTABLE	
Wow & flutter wtd	1.5%
Drift	average
Speed accuracy	n/a*
Arm/cartridge resonance	n/a*
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	n/a*
Cartridge channel separation	n/a*
Cartridge tracking ability	n/a*
*see text	
TUNER	
Sensitivity	good
Signal/noise	fair
CASSETTE DECK	
Wow & Flutter (wtd)	0.26%
Signal/noise ref 0dB Type II	n/a**
Distortion 0dB Type II	n/a**
**auto level control	
COMPACT DISC PLAYER	
Signal/noise (measured at amp Tape Output)	80dB
AMPLIFIER	
Power output/channel (8ohms)	3/5/5watts
(20Hz, 1kHz, 20kHz both channels driven)	
LOUDSPEAKERS	
Efficiency	very high



# SANYO 49CD

SANYO MARUBENI (UK) LTD., SANYO HOUSE, OTTERSPOOL WAY, WATFORD, HERTS. TEL: (0923) 246363.



As a package, the 49CD is about as rudimentary as they come. Everything bar the CD player and loudspeakers is housed in one system box, which isn't exactly over-endowed with socketry for additional external components. In fact there are no spare inputs or tape circuits at all, and there isn't even a microphone input allowing one to be bodged. If you're desperate you could consider using an input extender, such as one of the QED units, between the CD player and the solitary input accessible on the back for the player on the main system unit. What you're meant to do though is to treat this system as a self-contained unit for use in the form in which it is supplied. This is economy music making with no provision for future upgrading.

Styling eschews sharp edges and flat planes in favour of a softer, friendlier look based on dark matt grey plastic mouldings. Unlike the *System 39* which in many other respects this more costly system closely resembles, the 49CD is equipped with an infra-red remote control handset. Unusually, the handset doesn't allow you to turn the system on and off, and neither the turntable nor the cassette deck comes within the handset's scope of operation. Nor for that matter can the handset switch between the sources. It is used simply for tuning and selecting presets when switched to radio and changing between tracks and programming when switched to CD. The handset also has a volume control – and that's all, folks, except to note that the system is supplied with what are described as three free compilation compact discs.

## DCX49 MAIN SYSTEM UNIT

This single box has a turntable inset into the top panel, and deeply recessed feature lines running across the fascia to divide the tuner from the amplifier, and the amplifier from the cassette deck. The turntable is indistinguishable from its opposite number in the 39CD. It's a semi-automatic, with ceramic cartridge. Wow and flutter isn't too wonderful and most of the other tests had to be aborted because it wasn't possible to interface the Sanyo with the lab test equipment. However, the frequency response shape is *slightly* more benign than with the junior model.

The amplifier section is presented almost identically to its opposite number in the 39CD. One difference is the two-key electronic volume control, a rough and ready measure designed to allow remote control of this function. Under the skin there's another change, too. Power output has been jacked up to a more respectable 9watts/channel, though this is a far cry from Sanyo's claim which speaks grandly in terms of 20watts/channel RMS. Waveform clipping is so severe at anywhere near this point that the system is completely unusable. Remaining facilities include a five-band graphic equaliser.

Digitally tuned, the radio tuner has the same three-band coverage as the analogue tuner built into the 39CD system. Of course, digital tuning means presets, and there are six of these per band, the FM section being divided into two bands (FM1 and FM2) giving 12 presets on FM. Stereo/mono switching

is available. A standard 75ohm coax socket for the aerial is fitted on the rear panel, and FM performance is broadly similar to the 39CD – reasonably sensitive, modestly selective and a little noisy by the best standards, but more than acceptable all round in price context.

The cassette deck is broadly in line with the 39CD pattern. The two unidirectional transports – one record/playback, the other playback capable only – are mechanically operated, control feel being good of its type, but offering no shortcuts when dubbing etc. Sequential play of course is available, and tapes can be dubbed in real time (where quality is of the essence) or at double speed (where it isn't). Metal tapes can't be recorded on this deck, and tape selection on both transports is manual, which is bound to lead to errors. There's a simple tape counter, and in contrast to the 39CD there's also a Dolby B noise reduction circuit, a welcome addition. The automatic level control made some of the tests impractical, but wow and flutter levels are about par for the course. The record/replay frequency response (Type II) rises a little in the treble, whilst the playback only response does precisely the opposite.

## CP59 COMPACT DISC PLAYER

The P59 is used also in the other two Sanyo systems reviewed in this issue, and of course the same description and comments apply. With a very low control and feature count, the CP59 does everything most people need in a player including cueing, track skip, 16-



track programming and repeat. I'd suggest that most people won't miss the plethora of useless gimmickry that adorns most competing players, but they may well be somewhat taken aback by the two digit display which is severely compromised when asked to display time data during cueing operations. Nevertheless, the *CF59* is an adept tracker and in this sense isn't severely compromised.

The player was measured by connecting the test equipment to the headphone socket as there is no tape or other line level output. Under these conditions the deck is far from offering the deep, digital silence that is promised. The frequency response shape is also rather, well, odd.

## SX49 LOUDSPEAKERS

Physically resembling the *39CD*'s speakers, the *SX49* is distinguished by an increased power handling capability and by the fact that it is fitted with a working tweeter (!). Tweeter output is set to a very low level however, and judging by the scratchy noises that emanate, this is no bad thing. The enclosure is relatively lightweight, but more cannot be said as it's not clear how the unit can be opened non-destructively. The response shape trend is not dissimilar to that of the *39CD*.

## HOW IT PERFORMS

The slightly more accurate turntable frequency response is reflected in a richer, weightier and consistently more dynamic presentation of records, though surprisingly the *39*'s imperturbability in the face of physical shock and feedback is almost undiminished. The wow component of the wow and flutter figure sometimes makes its presence felt, and sometimes doesn't. Complex and densely scored music is beyond its capabilities, and mistracking wasn't entirely absent on high level, treble rich female vocal or choral music – and at other times too. But the deck often sounded perfectly satisfactory with simpler music.

The cassette deck suffered similar limitations to the record deck, especially in its inability to reproduce a sustained piano note (say) without an uncomfortable, edge of the seat feeling that it wasn't going quite right. There was also a feeling of clutter in the treble, especially when playing complex material, and some long term gain riding (increased volume levels during quiet passages) that detracted from the integrity of the musical experience. But Dolby noise reduction helped, both by reducing the tape noise floor, and also because it meant that pre-recorded tapes sounded more consistent and focused, even though performance here was a touch treble shy. So far then, so so.

The other two sources behaved well. Off-air AM sound quality was aided and abetted by a quite low level of susceptibility to interference, though treble output was correspondingly muted and the AGC had a more than usually severe dampening effect on dynamics. FM performance was good for a low cost unit. The *49CD* liked a strong signal to reduce hiss to innocuous levels, and a good aerial installation is therefore mandatory – but definitely worth the effort and expense involved. The CD player isn't the best budget player around, and objectively suffers many of the shortcomings of which CD is often accused, including a thin, grainy treble, some harshness and stridency, poor depth imagery and a lean, over-damped bass, though the latter is highly dependent on programme material.

But it's certainly not the limitation in this system, and these relatively subtle shortcomings are only really obvious after a system transplant. The amplifier sounds more assured than in the *39CD* system, especially at the higher volumes that elude the smaller amp, but it sounds equally transparent with just a suggestion of transistor edginess. Last and in most respects least, the loudspeakers perform almost identically to the ones supplied with the cheaper *39CD* system, which means they're a little hard and tonally

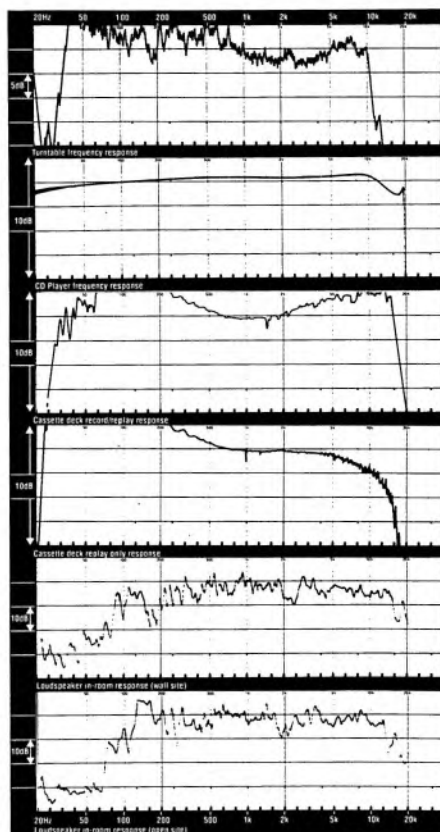
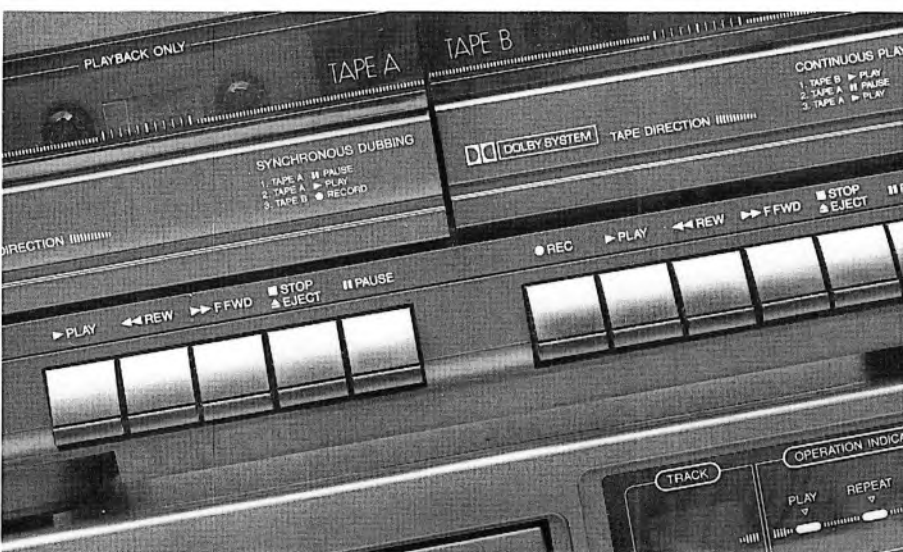
monochromatic, with a shallow bass, and coarse, recessed treble.

## VERDICT

The *49CD* system is easy to use and pleasing to look at. Its modest audio capabilities are not so modest as to stifle any chances of musical satisfaction however, and a guarded Recommendation is in order for those on a strict budget.

## TEST RESULTS

Cost with speakers	£300; without n/a
Options?	CD player
Size main unit	lid open, w/o projections 62 x 36 x 37cm (h x w x d)
Size loudspeakers	40 x 20 x 18cm (h x w x d)
<b>TURNTABLE</b>	
Wow & flutter wtd	0.23%
Drift	poor
Speed accuracy	n/a*
Arm/cartridge resonance	n/a*
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	n/a*
Cartridge channel separation	n/a*
Cartridge tracking ability	n/a*
*see text	
<b>TUNER</b>	
Sensitivity	good
Signal/noise	fair
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.27%
Signal/noise ref 0dB Type II	n/a**
Distortion 0dB Type II	n/a**
**auto level control	
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	77dB
<b>AMPLIFIER</b>	
Power output/channel (Bohms)	9/9/14watts
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	high



**JDI** AMPLIFICATION

**BRYSTON**  
4B Power Amp

"In combination with the  
ROKSAN XERXES  
ARTEMIZ SHIRAZ

the above being all but unbeatable and is indisputably better than the established market reference."

Hear it at:-

**SELECTIVE AUDIO**

The Forge Cottage, 19 Crossgate,  
OTLEY LS21 1AA, West Yorks.  
Tel: 0943 - 467689

Demonstration by Appointment

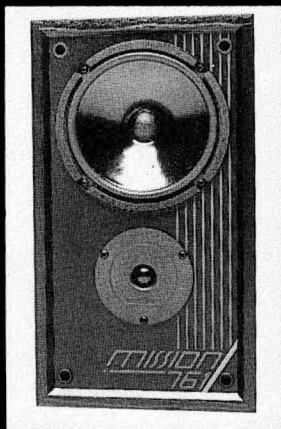
FOR ALL YOUR ROKSAN  
REQUIREMENTS AND  
AN UNBIASED VIEW ..



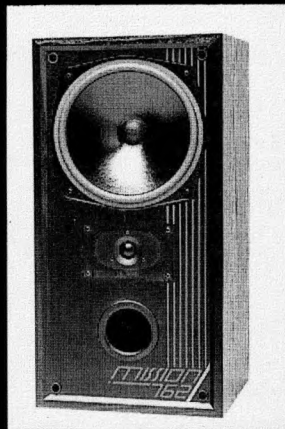
Prices to suit all pockets

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

# MISSION IN CHESHIRE



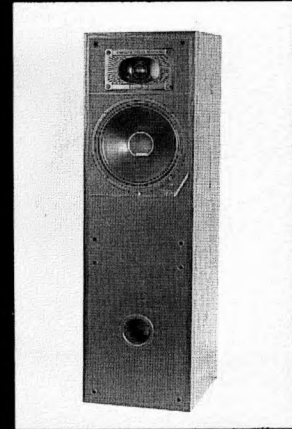
MISSION 761



MISSION 762



MISSION 763



MISSION 764

THE COMPLETE NEW MISSION RANGE IS IN STOCK AND ON DEMONSTRATION

We are also stockists for: MUSICAL FIDELITY, ALLISON, TARGET, AR, AIWA, ARCAM, AUDIOLAB, B&W, CELESTION, DENON, HEYBROOK, KENWOOD, MARANTZ, MONITOR AUDIO, MORDAUNT SHORT, NAD, PIONEER, QED, ROTEL, TANNOY.

★ FREE INSTALLATION ★ 2 YEAR GUARANTEE ON ALL HI-FI ★ FREE EASY PARKING



**SWIFT** OF WILMSLOW  
St. Anns Parade, Parsonage Green, Wilmslow, Cheshire.  
Telephone: 0625 526213

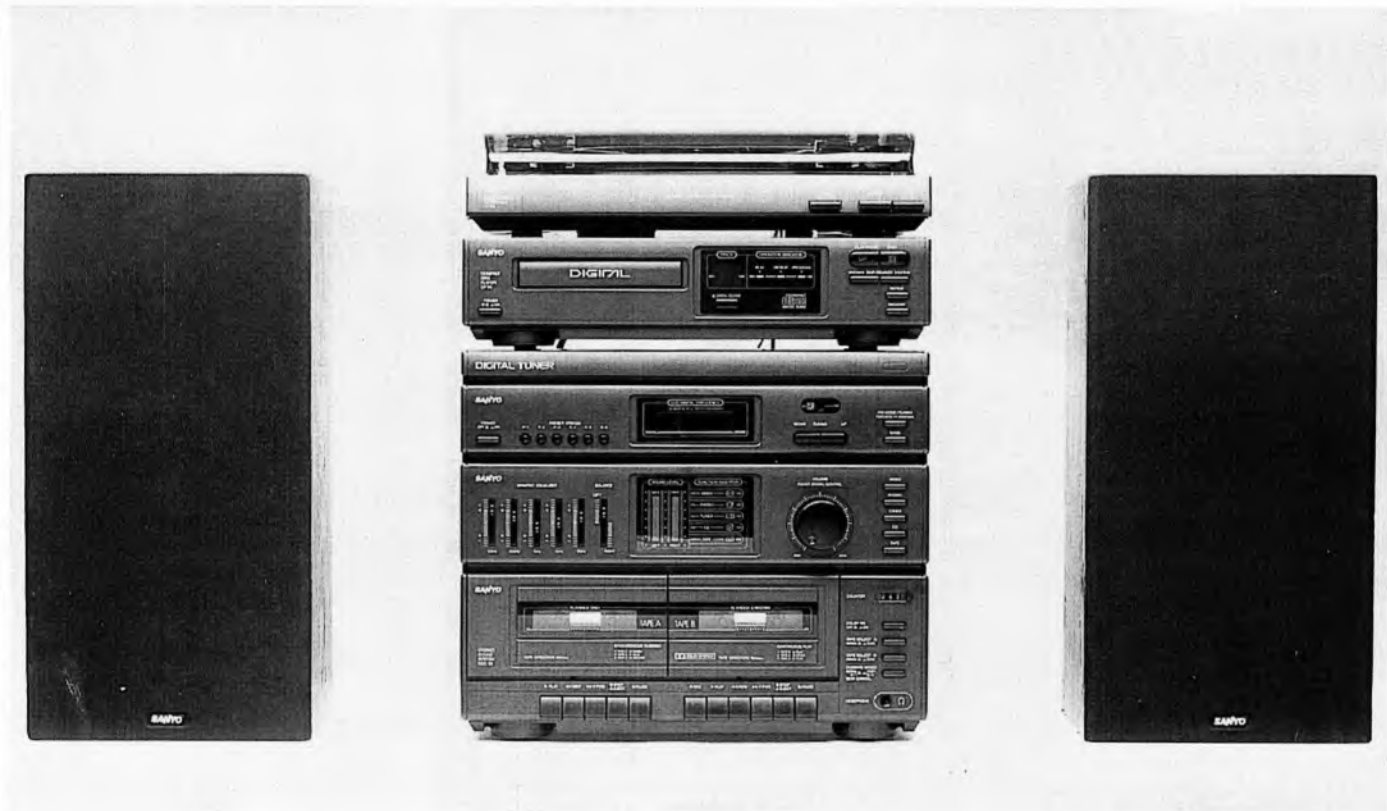
**BADA**  
THE ULTIMATE IN  
SOUND ADVICE





# SANYO 59CD

SANYO MARUBENI (UK) LTD., SANYO HOUSE, OTTERSPOOL WAY, WATFORD, HERTS. TEL: (0923) 246363.



The third of our Sanyo triumvirate, the *59CD*, sells for £80 more than the *49CD*, and £120 more than the *39CD*, for a package that appears to share a great deal in common with the *49CD* especially. Such gaps take some justifying, and the *59CD* attempts to do so in a number of ways which include the provision of a better, more comprehensive remote control handset, greater power and a more elaborate loudspeaker design. The system is also packaged in a slightly different way. The turntable is a separate item with this system. Indeed it's a quite different turntable, which has important consequences for record reproduction. In common with the other systems, the price quoted includes three free compilation CDs.

The amplifier, tuner and cassette deck are still housed in a single package. The CD player and record deck communicate audio with standard phono leads, and remote control signals through a ribbon cable link, which means it's feasible to upgrade these two items at a future date without problems apart from the loss of remote control operation. The loudspeakers are more readily replaced here than with the two cheaper Sanyo systems as the amplifier power output is nearer to the kinds of levels that most loudspeakers demand.

I've already touched on the remote control. In broad terms it's similar to the one that comes with the *49CD*, but there are differences, the most important being that source switching is now available from the handset, including the solitary spare input. As an example, the phono input can be

selected remotely, though you can't then start a record playing since the record deck isn't automatic. Indeed there's no provision to reject a record remotely either.

Leaving the remote control to one side, the system itself has certain inconsistencies in the way it operates. Pressing any of the tuner keys (for example a preset button) changes the amplifier source to 'tuner', and the same occurs with the CD player. However, the auto-source select feature doesn't operate with the record or cassette decks, presumably because they would have had to be re-engineered to allow electronic control, which of course they should have been in order to make the system operate in a consistent way.

## TP59 TURNTABLE

This smartly finished deck has ingredients that will be familiar to midi system watchers. The deck is semi-automatic (that is, auto-return) and driven by belt from a DC servo motor, the industry standard construction for system turntables. The platter, like almost all of the rest of the deck, is made from moulded plastic and has minimal resistance to rocking motion. The arm is no great shakes either, but like the platter it's better than the one fitted to the cheaper Sanyo systems, and it's also unique in this company in having a magnetic cartridge rather than a ceramic. The cartridge frequency response is somewhat wayward, with a hint of a sharp HF resonance, probably in the 18-20kHz region. Wow and flutter is poor too, while the other tests had to be abandoned due to interface

problems with the test equipment.

## DCX59 MAIN SYSTEM UNIT

The amplifier is capable of 15watts/channel across the full audio bandwidth, beyond which it goes abruptly into harsh, terminal clip. In the now familiar way, the amp is equipped with a five band so-called graphic equaliser, in this case supplemented by an uncalibrated input level display (labelled sound level, which implies that it indicates power, viz: after the volume control. It simply isn't so.) The input selectors are electronic rather than mechanical, which facilitates remote control, and Sanyo has added an illuminated input level display, misleadingly described as a function display.

The two sources included with this product appear to be identical to their opposite numbers in the *49CD* system. Thus the synthesiser tuner has two sets of six FM presets, plus six each for MW and LW, with optional stereo/mono switching and an attractive orange back-lit display showing, amongst other things, the waveband, tuned frequency and the preset number. The tuner differs in one respect from the *49CD* tuner though: it has an external loop aerial which can be independently oriented to optimise reception. AM performance did appear to benefit a little, but FM appeared identical, which is perfectly satisfactory.

Similarly, the cassette has a recording and a playback only transport, both unidirectional by the way. The transport controls employ high grade mechanical triggering. Dubbing is possible, as is sequential play in



the now traditional fashion. Record levels are set automatically, but tape type selection is manual with either deck, and metal tapes are not catered for. Noise reduction is available courtesy of Dolby B. Wow and flutter levels are poor, but the record/replay response is excellent, at least once the sharp head contour 'woodles' have been left behind above 100Hz. The replay only response shape is also good, though a little bright.

## CP59 COMPACT DISC PLAYER

The CP59 is Sanyo's standard midi system CD player, and was also described in the reviews of the 39CD and 49CD. The player has rudimentary programming for up to 16 tracks, repeat, disc cueing and track skip, the last two functions integrated on to a single pair of up/down controls. The display normally shows track numbers only, but whilst cueing shows the current position in terms of time by displaying minutes (units only) and seconds (the tens digit only), which in my opinion is too much of a compromise. Tracking and track access times are better than with many of the Sanyo's peers, but the measured frequency response is compromised by the anti-aliasing filters, and noise levels, measured at the headphone socket, are poorer than expected.

## SX59 LOUDSPEAKERS

The SX59 is not designed to be dismantled, and the manufacturer's printed propaganda is not exactly forthcoming with information. The speakers are not even mentioned in the range brochure, and no instructions were supplied. What *can* be said is that they're very similar to the SK59 (see 49CD review) except that they're a little larger and seemingly a little more solid. However, the measured in-room frequency response is if anything, even more ragged and erratic.

## HOW IT PERFORMS

In stark contrast to the two cheaper Sanyo systems, I found the standard of sound qual-

ity here definitely not to my liking. There's more power, but it's grudgingly doled out by the amplifier, or so it seems, and loud passages sound deliberate and manipulated, almost as though the system wants to make it clear that it's having to work hard. Worse, the loudspeakers are not merely lacking in the treble, they're actually unpleasant in this region. Music with any significant treble content sounds smeared and metallic. Cymbals perform as though made of corrugated iron, and female vocalists appear to be singing through a severe cold. Orchestral strings are coarse and recessed. The midband is undimensional and boxy where by rights it should sound atmospheric and spacious. At the same time, the bass sounds surprisingly tactile - there are no complaints here. This is a clear case where a loudspeaker transplant is called for.

Naturally enough, the CD player and FM tuner were musically far better than either the turntable or the cassette deck, both of which suffered from the now familiar lack of pitch precision. The cassette deck was clearly the worst offender here, and also suffered a more congested, compressed midband and treble quality, which stressed the amplifier and speakers in ways they were least well equipped to handle. But neither component is all bad; in fact both build on the qualities of the cheaper Sanyo systems. The record deck in particular is smoother in the treble and both larger in scale and weightier than the ceramic cartridge equipped counterparts. It also behaved more consistently at different volume levels (a fact partly concealed by the amplifier) and gave a subjectively superior signal/noise performance. Background vinyl noise also seemed lower in level.

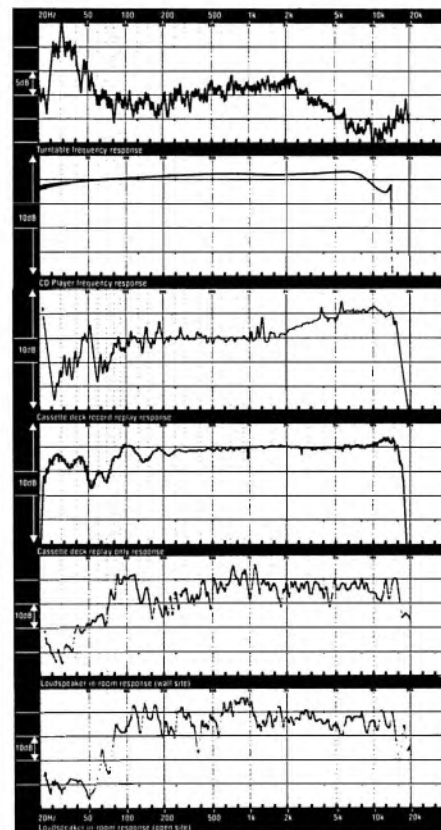
## VERDICT

The Sanyo 59CD is an inconsistent product. Although significantly better than the 39CD and 49CD in certain areas, it has been left alone in others. On the ease of use side, auto-

source selection is reserved only for CD and radio; omitting the other sources smacks of expediency. On the musical side, the cassette deck and turntable sound better than in the 49CD, yet the crucial lack of pitch stability that afflicts the cheaper systems apparently hasn't been addressed at all. The 49CD system is quite simply better value for money.

## TEST RESULTS

Cost with speakers	£380; without n/a
Options?	CD player
Size main unit	lid open, w/o projections 79.5 x 36 x 37cm (h x w x d)
Size loudspeakers	44.5 x 22 x 18cm (h x w x d)
<b>TURNTABLE</b>	
Wow & flutter wtd	0.25%
Drift	average
Speed accuracy	n/a*
Arm/cartridge resonance (<10Hz too low, OK, >14Hz too high)	n/a*
Cartridge channel balance	n/a*
Cartridge channel separation	n/a*
Cartridge tracking ability	n/a*
*see text	
<b>TUNER</b>	
Sensitivity	good
Signal/noise	fair
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.32%
Signal/noise ref 0dB Type II	n/a**
Distortion 0dB Type II	n/a**
* auto level control	
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	76dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms) (20Hz, 1kHz, 20kHz both channels driven)	15/17/15watts
<b>LOUDSPEAKERS</b>	
Efficiency	medium high



# SONY COMPACT 301CD

SONY UK LTD., SONY HOUSE, SOUTH STREET, STAINES, MIDDLESEX. TEL: (0784) 467000.



Sony's new season models offer neat, modern aesthetics whose primary feature is the gently rounding of the dark grey (not black!) fascia sections that divide each functional section from the next. The visual user-friendliness is complemented by a simple, logical control layout, so although this relatively straightforward unit doesn't aspire to auto source selection, ease of use nevertheless remains high. A full feature remote control is included.

The 301CD looks as if it is constructed entirely from components, but is in fact built around a central unit comprising an amplifier, tuner and cassette deck. The CD player and record deck are separate items, as are the non-optional loudspeakers. Build quality is lightweight as befits the price, but finish and control feel are excellent, verging on superb. Whatever else it may be, the *Compact 301CD* certainly doesn't look or feel cheap, except (as with the turntable) where the lack of engineering takes its toll on the bits you handle and hear.

## PS-LX40P TURNTABLE

Relentlessly under-engineered, the *FS-LX40P* is a DC servo motor, belt drive turntable with a thin, flimsy plastic record platter and an arm which has a narrow diameter armtube and rattly bearings. The cartridge is a magnetic, but it uses a proprietary (or at least an unfamiliar) fitting, and is not as readily replaceable as a *T4P* cartridge would be. Player operation is auto return; the cueing feature is rather quick in action, and the cueing lever is located near the arm base,

making it inaccessible from the front of the system. The measured frequency response rolls off in the treble, and is more or less non-existent in the bass, whilst the turntable has modest wow and flutter levels which at the price are no worse than average, but still not as good as they need to be.

## CDP-M26 COMPACT DISC PLAYER

This standard looking system CD player is distinguished by its clear logical controls and display, and the label on the bonnet which announces as its progenitor one of the two designers of the CD medium – Sony itself. Features included, in addition to the usual audible cueing and track search, are programme, repeat and random (shuffle) play and for tape freaks, auto space and a programmable pause command. The player will also give a time read-out for programmed selections, or suggest running sequences to fill tapes of specified length. The player has an attractive time/track/index read-out with a single row calendar style read-out of track numbers available – or programmed. Disc handling is slight though not very fast, and error handling is good, though not Philips style good.

## XO-D301 MAIN SYSTEM UNIT

The amp has no spare inputs, and outputs for just one pair of loudspeakers plus of course headphones. Between the in and outputs, the signal can be manipulated by a five-band equaliser which has separate controls for the

two channels. Power output measured 15 watts/channel. The tuner, which is almost equally purposeful, has three groups of ten preset keys (A, B and C, selectable with a 'shift' key), each of which can store a frequency on FM, MW or LW. The tuner section also has a preset scan feature – but no mono switch. FM sensitivity and selectivity are not this system's strength, but AM reception quality was satisfactory.

Finally, the cassette section is an ergonomic gem. As usual, one transport only records, and both are unidirectional. Dolby B is included, as are the usual dubbing and sequential play options. Tape type selection is automatic, and recording levels are also set automatically. The only restriction is that metal tapes cannot be used for recording, which is little loss with this type of product. Metals can still be played back. On the test bench the deck performed moderately well, with good tape/head contact integrity, but rather poor pitch integrity.

## SS-A301 LOUDSPEAKERS

Sony has clearly gone to some lengths to endow its loudspeakers with a reasonably sophisticated exterior; one that implies good engineering without actually providing it, thus helping ensure confidence even if it doesn't exactly earn it. Technically the *SS-A301* is, er, primitive. The nominally sealed enclosure is flimsy and resonant, the electrical system is no more inspiring. But the plastic imitation metal drive unit surrounds look good glinting through the open-weave covers. The recessed baffle is not such a clever idea,

and neither is the nasty captive wiring. However, with all the apparent disadvantages, the frequency response shape shows good overall balance through the bass and mid. The treble however looks bright.

## HOW IT PERFORMS

Expectations of musical excellence were none too high at the start of this review. In fact Sony has marshalled the relatively meagre resources open to it with some skill, and the result, although it won't do much for the average red-blooded purist, is creditable and even, and for the most part, fairly musical. True, speech sound quality, assessed off air, was a little thin and boxy, which is largely attributable to the resonant construction of the loudspeakers. Bass is distinctly lacking with all inputs, even given the speakers' quite compact dimensions, and the treble is somewhat fierce and metallic, which gave an effective cutting edge to brass and helped pull percussion instruments forward in the otherwise rather flat soundstage produced by the system as a whole.

But for all its lack of sophistication, the system generally – and the loudspeakers in particular – sounds energetic and clear. The system has a quick attack and behaves well with transient rich material, not overhanging when the stimulus has passed. The result is a system that appears to have quick responses, and that seems more certain than you might expect in the way pitch information is reproduced (except at the frequency extremes). The one caveat here is with cassettes which are extremely wobbly when playing sustained notes; a pity really since tape reproduction is otherwise reasonably crisp and clear. As long as the system is protected from excessive footfall shock and vibration, record reproduction has much of the stability tape lacks, along with a smooth, firm and attractive tonal quality. Only the thin bass gives it away. But predictably CD extracted the best from this system, and the CD player clearly shines in this company.

However, I do have certain criticisms of the 301 system. One is pretty obvious, being the way Sony has made such a feature of the graphic equaliser, which scarcely merits the name with only five bands at its disposal, and which did little to address the real limitations of the system. Reducing treble to bring the perceived frequency response into line did have a slight sweetening and civilising effect on the sound, but it was achieved at some cost to clarity, suggesting that the excess treble is not best tackled by the primitive technique of throwing it away. By the same token, the occasionally acid balances could be warmed up with a touch of left hand up on the 100Hz slider, but this is no panacea: there were strict limits on the amount of extra bass that was sustainable without loss of clarity and dynamics in the bass. In any case, much the same effect is available using a standard bass control since the Sony's equaliser tuning doesn't seem very sharply focused around the advertised centre frequencies.

There were also features I missed, which weren't adequately implemented. The aerial input is poorly matched to the tuner front-end for example, and I found reception relentlessly noisy on all but the strongest FM channels. To add injury to, er, injury, the omission of a mono switch for FM use made it impossible to deal with the mess the tuner input made of the signal input. I should stress that I used a 'stripped' 75ohm input lead connected to the 75ohm input (I even tried it into the 300ohm terminals), and also tried using a 75ohm to 300ohm transformer or 'balun', to little obvious benefit.

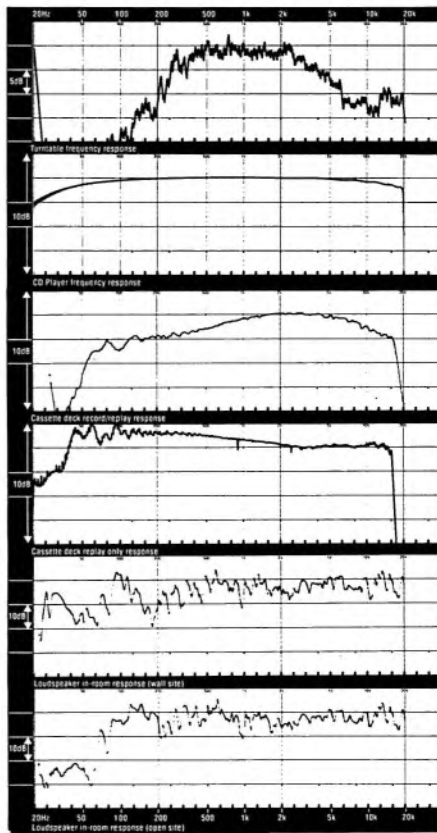
## VERDICT

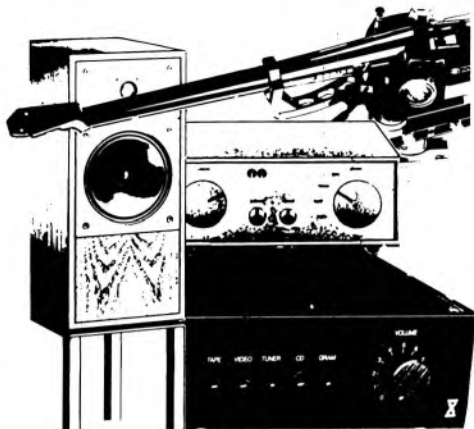
This system has numerous benefits. It's simple to use and sits easily on the eye, which is important if it's going to occupy pride of place in a living-room for some years. It has a degree of musical integrity, almost amounting to *joi de vivre*, that helps it overcome a number of intrinsic shortcomings. In the end

I have withheld Recommendation, but only because I think many people are going to have to struggle to achieve hiss free FM stereo reception (even in areas of strong signals), and also because of the limitations of the cassette deck transport.

## TEST RESULTS

Cost with speakers	£399.95 without n/a
Options?	none
Size main unit	lid open, w/o projections 72 x 35.5 x 36.5cm (h x w x d)
	42 x 23.5 x 19cm (h x w x d)
Size loudspeakers	
<b>TURNTABLE</b>	
Wow & flutter wtd	0.15%
Drift	average
Speed accuracy	+0.3%
Arm/cartridge resonance	too low
( <10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	28dB
Cartridge channel separation	-1.4dB
Cartridge tracking ability	80µM
<b>TUNER</b>	
Sensitivity	poor
Signal/noise	poor
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.21%
Signal/noise ref 0dB Type II	n/a*
Distortion 0dB Type II	n/a*
*auto level control	
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	97dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms)	14/15/15watts
(20Hz, 1kHz, 20kHz both channels driven)	
<b>LOUDSPEAKERS</b>	
Efficiency	above average

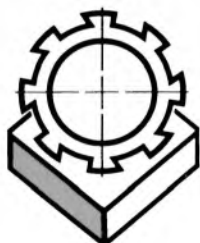




### XERXES

This remarkable player is being constantly refined so that it is now better (and better value) than ever; but for the first time in over a year, Roksan have announced a major improvement.

The new power supply offers advantages in pitch accuracy and detail resolution that have to be heard to be believed and the overall effect is that the music is simply more solid and believable than ever before. The new unit is supplied as standard with current players and is an essential upgrade for all Roksan owners. Bring in your existing power unit and we will fit the new circuitry, fully test the unit and return it to you in a matter of hours. Please ring to confirm availability as we are sure that demand is going to be huge. Provisional cost is a very reasonable £150 including fitting.



**ROKSAN**

### DARIUS

This unique loudspeaker is being constantly improved and the latest models, with separate mono cross-overs are spectacular. A more conventional type of floor stand will allow this loudspeaker to fit into more homes than ever.

Ⓞ LINN Ⓞ NAIM  
Ⓞ DENON Ⓞ CREEK  
Ⓞ AUDIO TECHNICA



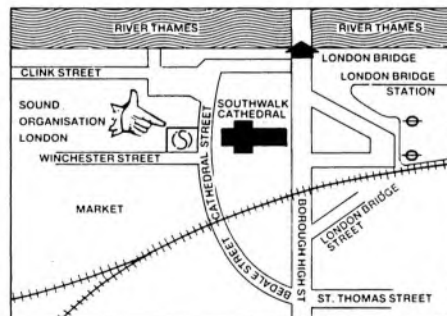
SOUND  
ORGANISATION  
LONDON

## CUT THROUGH THE HYPE AND GET TO THE MUSIC

The equipment we sell is chosen on its ability to play music, rather than on specifications, or its ability to get good reviews. If you want to buy "flavour of the month" products we suggest you look elsewhere.

Dogma plays no part in our choice of stock and we are not politically tied to any one brand. We do however limit choice a little, by carrying out thorough preselection. If it doesn't sound good, we won't sell it! If another dealer recommends something we won't stock, get him to make it sound good, before you ask us for comment.

To ensure that equipment is properly set up and thoroughly warmed up, we feel it is essential that full demonstrations are carried out by appointment. However, if you just wish to look around and get a feel for us and the type of equipment we recommend, please feel free to visit at any time.



### THE SOUND ORGANISATION LONDON

One Cathedral Street, London, SE1 9DE.  
01 403 2255/3088

Opening Times: Tues-Sat. 10am to 6pm.  
CLOSED MONDAYS

Ⓞ REGA Ⓞ ROKSAN  
Ⓞ SENNHEISER Ⓞ ROYD  
Ⓞ HEYBROOK Ⓞ EPOS



### TABRIZ

Not one, but two new arms from Roksan. If everything goes to plan, these arms should be available about now, but initial supplies are bound to be limited.

Using techniques originally developed for the superb Artemiz, The Tabriz is expected to appear in two different versions although both arms share common points such as an Artemiz style one piece arm tube.

The simpler model has a conventional counter weight and provides an excellent 'entry level' combination with the Xerxes. The more advanced model includes an Artemiz type 'Intelligent Counter Weight' and special arm wiring and interconnect lead. Prices are not yet fixed but it is expected the cheaper model will be under £200.

### ARTA-XERXES

Rarity value alone should make this new unit worth investigating. It is a dedicated phono pre-amp, specially configured for the Shiraz cartridge and fitting inside the Xerxes.

The Shiraz produces a very high output for a cartridge of its type and many input stages simply cannot handle the level, but the Arta-Xerxes handles it with ease and produces a flat, line level signal that feeds straight into a high level input, totally overcoming the distortion problem. Not a new idea of course but surely the first designed to improve upon a dedicated m/c input.

A release date has not yet been confirmed but we shall have this unusual unit on demonstration as soon as it is available.

Ⓞ EXPOSURE Ⓞ ONIX  
Ⓞ ROTEL Ⓞ CHORD CO  
Ⓞ SME Ⓞ WHARFEDALE

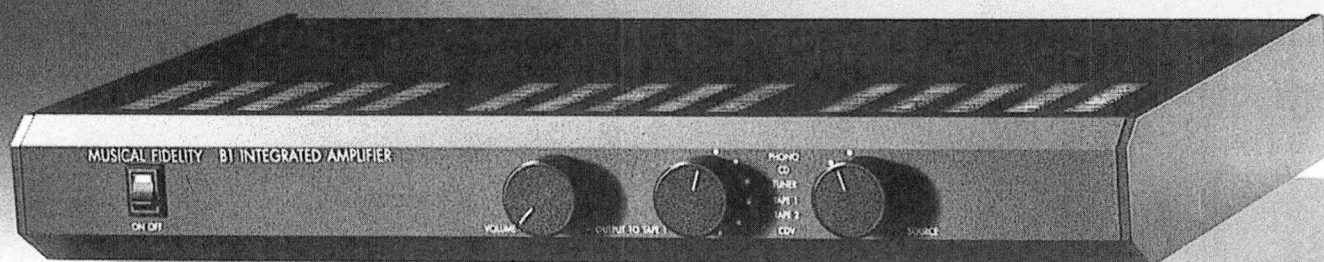


Computers, kettles, fridges,  
electric carving knives.  
(Just some of the things you  
won't find at In Hi-fi.)

What you will find is the best range of quality turntables, amplifiers, CD players, tuners & speakers.  
IN HI-FI, 63 GEORGE STREET, EDINBURGH. TELEPHONE 031-225 8854. WE STOCK KEF, MISSION CYRUS, MERIDIAN, QED, MUSICAL FIDELITY, QUAD, ETC.

**IN HI-FI**

**DON'T SETTLE FOR A BORING AMP  
WHEN THE SAME MONEY BUYS YOU A B1.**



B1 integrated amplifier. £199.99 UK retail, at a hi-fi shop near you.

MUSICAL FIDELITY LIMITED, 15/16 OLYMPIC TRADING ESTATE, FULTON ROAD, WEMBLEY HA9 0TF.

**MUSICAL**

**FIDELITY**

# SONY COMPACT 501CD

SONY UK LTD., SONY HOUSE, SOUTH STREET, STAINES, MIDDLESEX. TEL: (0784) 467000.



Sony's *Compact 501CD* system is based closely on the *Compact 301CD* also reviewed in this project. This piece should be read in conjunction with the *Compact 301CD* review, which provides further information on features shared by both systems. The two are presented in almost identical packaging and are obviously aimed at the same kind of buyer, who can probably best be thumb-nailed as style conscious and disenchanted with the usual button happy products. What is different is that the *501* costs an extra £100, and of course offers a range of extra and improved features, in particular more power and improved loudspeakers. Certain features remain the same, examples of which include the turntable, CD player, and the remote control handset.

Whereas the cheaper system is only available in dark grey, this one will also be available in white at no extra cost. Even the remote handset is colour keyed, though not it seems the loudspeakers.

The system is supplied in the form of a central unit containing the amplifier, tuner and cassette deck, with false front panel divisions to help group the various operating features. The CD player and turntable are separate components, of which the former is an option.

## PS-LX40P TURNTABLE

Carried over from the cheaper Sony system, the turntable is a low grade system component with belt drive, a servo controlled DC motor and a lightweight plastic platter with an ultra thin rubber mat. The chassis is

equally unprepossessing and the system is somewhat resonant and excitable. However, it's not as bad as it might be. Shock absorbing feet are tuned to a fairly high frequency, and most of the low frequency rubbish isn't allowed into the player, resulting in a less boomy sound, though deep bass has been sacrificed in order to achieve this. The lab test frequency response shows just how dramatic the losses are at both ends of the frequency band, which suggests we're also talking about cartridge inadequacies. The magnetic cartridge was installed badly askew (as viewed from the front) on the test turntable, and channel balance is awry. Turntable pitch stability is also bad.

## CDP-M26 COMPACT DISC PLAYER

This unit too is carried over from the *301* system. In essence it's a conventional low cost player, better designed than usual with good disc handling, well thought through controls, and attractive, understandable displays – including calendar style track read-out in a single, unobtrusive row. Shuffle, repeat and programme play modes (for up to 20 tracks) are available. The remaining microprocessor capacity is allocated to a small batch of features designed to help divide CD programmes across the two sides of predetermined length tapes with the minimum of hassle or waste.

## XO-D501 MAIN SYSTEM UNIT

The tuner section can store a full 30 ran-

domly selected presets culled from the three wavebands provided: FM, MW and LW. A preset scan feature is available, which amounts to a kind of intro-scan of the kind found on cassette decks, rejigged for radio. The curious thing is that no comparable facility is available for the CD player or cassette deck which suggests a certain lack of global thinking. If it's useful off air, isn't it also useful elsewhere? More important than this, the tuner lacks a stereo/mono switch to help cope with weak FM signals, and it also lacks properly designed aerial terminals. It seems Sony prefers spring terminals to aerial sockets or clamps, and spring terminals are an unmitigated disaster with signals in the microvolt region.

Cassettes are handled by a deck which features two auto-reverse transports (mechanical end of side changeover as usual for Sony) and only one of the decks records. Its capabilities include sequential play, normal or high speed dubbing and Dolby B noise reduction. Omissions include a tape counter and Dolby C. Record levels are set automatically, and tape groups are recognised automatically, though metal tapes cannot be used when recording.

The amplifier section has a measured power output of 28watts/channel. In common with the *Compact 301CD*, there are absolutely no unassigned inputs, rendering the system rather vulnerable to future developments. DAT, CDV, Nicam – there's no ready means of using any of them. A five-band graphic equaliser is fitted with separate left and right channel faders. There are also

two features not found on the 301 system, a loudness control arbitrarily renamed DBFB, and a rudimentary surround sound circuit.

## SS-A701 LOUSPEAKERS

Available on the separates market where it is described as 'a budget priced speaker for those who wish to upgrade midi system speakers', the SS-A701 is a compact three-way design with a 16cm cone bass unit and 6.5cm mid/treble unit (the crossover point is at 2kHz), with a tiny 1.6cm unit covering the final octave or so above 8kHz. This makes the 701 a conventional two-way with a tacked on supertweeter as opposed to a 'true' three-way where the middle unit is dedicated strictly to the midband, running from say 300Hz to 3kHz. On test, the system has an even mid-band with some raggedness towards the treble and bright tonal balance. Bass output is limited in both scope and neutrality.

## HOW IT PERFORMS

In many ways this is an impressive sounding system. Some of the most important weaknesses in the 301 system are effectively addressed here, the most striking of which are the cassette deck and the loudspeakers.

Unpromising though the loudspeakers look, Sony has succeeded in making them work creditably well. Although borderline by hi-fi standards, they possess an alluring balance with more than just a trace of warmth and depth in the midband, and a tidy if rather uneven and excessive treble. The bass doesn't go very deep, but the shortfall isn't as obvious as it is with the similarly proportioned SS-A301 speakers used in the cheaper system. However, I believe this has more to do with system balance than it does the extra drive unit, since many other two-way designs of comparable size have no trouble outperforming either of the two Sonys for bass depth, power and tunefulness (and usually all three at the same time). Ultimately though, the reasons don't matter—the 701s work, and that's what counts.

The cassette deck offers a standard of sound quality which in absolute terms is noisy and grubby, with clear compression at high levels and an inability to track dynamics long term, due to the action of the auto-level control circuit. The tonal response was also modified from the source, yet the deck had a degree of stability that the cheaper Sony didn't possess, poor measurement notwithstanding, even though we're dealing with an auto-reverse transport design which can normally be relied on to compound transport problems. The cassette deck remains below par, especially in the company of the CD player and even the turntable, but it's no longer completely unacceptable.

Records and CD performed almost exactly as in the cheaper system. Records lack real bass depth, but the sound is smooth and attractive; whilst CD is sharp and incisive and really makes the system sit up and sing. Of course, the improved amplifier and (particularly) speakers also do their bit to help the system on to a higher plane with these sources.

The tuner lacks a mono switch and has a poor input terminal block, yet with an identical paper specification to the Compact 301CD system tuner it puzzlingly insisted on pulling a stronger, lower noise signal off air. Nevertheless, it failed to match the standard set by almost any comparable system, and the FM tuner is consequently a major weakness. This is a pity, if only because on the odd signal that was received without hiss, sound quality was clean and concise.

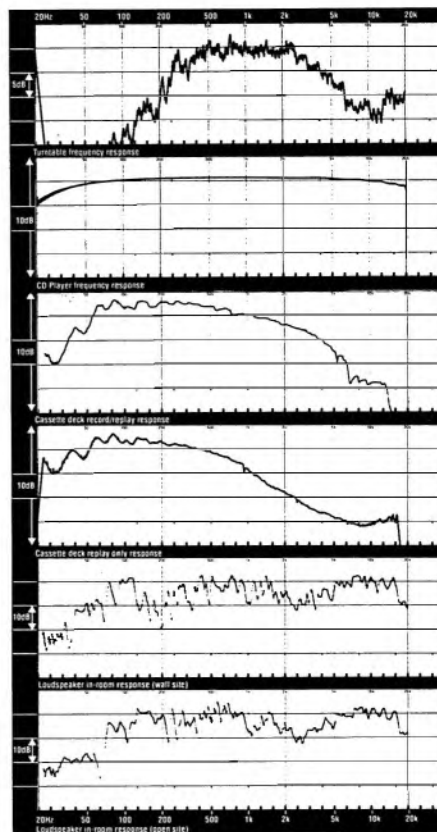
## VERDICT

Most of the requirements of a system are met. In contrast to the Compact 301 the 501 demonstrates greater consistency between sources and a more authoritative, colourful and refined sound in each case, due to the improvements in the amplifier and loudspeakers. However, added value features like the surround sound facility are a waste of time and the tuner is still fatally flawed by its

seeming inability to perform free of FM hiss on all but the strongest signals.

## TEST RESULTS

Cost with speakers	£500; without n/a
Options?	none
Size main unit	lid open, w/o projections 72 x 35.5 x 36.5cm (h x w x d) 43 x 24 x 1.9cm (h x w x d)
Size loudspeakers	
<b>TURNTABLE</b>	
Wow & flutter wtd	0.25%
Drift	average
Speed accuracy	-0.3%
Arm/cartridge resonance (<10Hz too low, OK, >14Hz too high)	—
Cartridge channel balance	1.9dB
Cartridge channel separation	-29dB
Cartridge tracking ability	80µM
<b>TUNER</b>	
Sensitivity	below average
Signal/noise	below average
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.20%
Signal/noise ref 0dB Type II	n/a*
Distortion 0dB Type II	n/a*
*auto level control	
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	79dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms) (20Hz, 1kHz, 20kHz both channels driven)	20/28/28watts
<b>LOUDSPEAKERS</b>	
Efficiency	medium



# 1st choice in Colchester for Quality hi-fi . . .

QUAD



QUAD



QUAD

- |           |                    |
|-----------|--------------------|
| GYRODEC   | CELESTION          |
| ROGERS    | AUDIOLAB           |
| ROYD      | ROTEL              |
| QUAD      | SPENDOR            |
| NAD       | MISSION            |
| DUAL      | SONY ES            |
| DENON     | WHARFEDALE         |
| ORACLE    | SYSTEMDEK          |
| YAMAHA    | J A MICHELL        |
| HEYBROOK  | MARANTZ            |
| QED       | AUDIO TECHNICA     |
| AR        | SOUND ORGANISATION |
| TANNOY    | SENNHEISER         |
| BEARD     | AUDIO INNOVATION   |
| SNELL     | CYRUS              |
| CAMBRIDGE |                    |
| TDL       |                    |

- 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



# VICTORIA AUDIO

3 Warwick Way  
Victoria  
London SW1



Tel: 01-630 9444  
9.30am-6.30pm  
Mon.-Sat.

**MAIL ORDER  
FREE CARRIAGE**  
Anywhere in the U.K.

ARISTON  
NVA HEYBROOK  
DENON  
ROTEL  
ORACLE  
JEFF ROWLAND  
INFINITY  
SENNHEISER  
GALE  
CONRAD JOHNSON  
REVOX  
CANTON

AUDITION THE  
NEW ROCK REFERENCE  
*NVA Cube 1*  
The "Rock" Reference  
*Cube 1*



### BOSE

101	£139
205	£199
301	£269
401	£399
AM5 Black	£499
AM5 White	£499

901 on special offer -  
Free Sansui CDX 701

ALPHASON SONATA

### 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  
and SME and CAMBRIDGE AUDIO

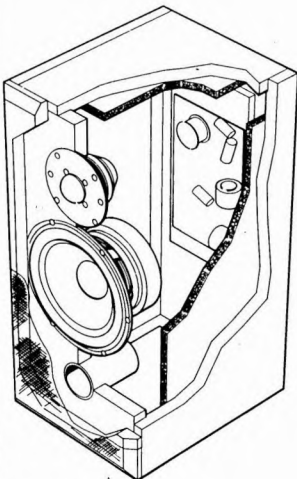
★ SINGLE SPEAKER DEM ROOM ★

## THE DIGITAL 90

A reflex design optimized for CD, the Digital 90 loudspeaker was developed to compete with the best of ready made compact speakers but at a 'DIY' price.

Ideal for use where space is at a premium, the Digital 90 uses Scanspeak's latest Hitech bass unit teamed with the acclaimed Elac metal dome tweeter in a cabinet of only 15 litres. The split-circuit crossover allows biwiring without further modification. The kit comprises of the

drive units, crossovers, reflex ports, binding posts (8), wadding, grille fabric, flatpack cabinets, (accurately machined from 18mm MDF with all rebates etc. ready cut).



Dims: 480x220x250mm  
Response: 45hz - 20Khz  
Sensitivity: 87dB 1w/1m  
Amp. suitability: 20 - 100 watts.

PRICE: £259 inc. VAT  
plus carr/ins £13

telephone credit card orders

WILMSLOW AUDIO LTD

**NEW ADDRESS AFTER SEPTEMBER 25TH**

Wellington Close, Parkgate Trading Estate  
Knutsford, Cheshire WA16 8DX Tel: 0565 50605  
(Closed all day Mondays)

DIY Speaker Catalogue £1.50 post free (export \$6)

## Bill Hutchinson

HI-FI, AUDIO & C.D. Centre  
SALE \* Sales \* Service \* SALE

ROTEL KENWOOD

marantz Technics

ARISTON Dual AIWA

DENON TANNOY JVC

SALE Mordaunt-Short AR PIONEER

YAMAHA ACUSTIC RESEARCH NAD

SALE NOW ON

Leading loudspeakers. Plus all leading brands. Our aim is to  
provide the highest level of service and value available in  
Scotland

SALE 43 HOPE ST GLASGOW  
041 248 2857. SALE

43 SOUTH CLERK ST EDINBURGH  
031 667 2877



NO 1 FOR  
SERVICE  
AND VALUE







# MUSICAL IMAGES LIMITED

45 HIGH STREET  
HOUNSLOW  
MIDDLESEX TW3 1RH  
TEL: 01-569 5802

AMPLIFIERS	Rotel RA810A	£109.90
	NAD 3225PE	£149.90
	A&R Arcam Alpha	£179.90
	MF B1	£199.90
	Yamaha AX630	£259.90
	AR A07	£279.90
	A&R Delta 60	£259.90
	A&R Delta 90.2	£399.90
Marantz PM75	£449.90	
Audio Innovations 500	£799.90	

TURNTABLES	Ariston Q Deck inc. Cart.	£165.90
	AR EB101 inc. Cart.	£229.90
	Dual CS5000 BK	£199.90
	Systemdek IIXE	£249.90
	Michell Syncro/Syncro Arm	£329.90
	Michell Gyrodec IRB300	£689.90
	Alphason Sonata ex. arm	£689.90
Roksan Xerxes/Artemiz arm	£1104.90	

TAPE DECKS	Aiwa ADF270	£99.90
	Yamaha KX130	£119.90
	Nad 6325	£159.90
	Denon DRM500	£169.90
	Aiwa ADWX777	£179.90
	Denon DRW750	£229.90
	Akai GX52	£249.90
	Kenwood KX5010	£269.90
	Nakamichi CR1E	£344.90
	Nakamichi CR2E	£394.90
Nakamichi RX202E	£539.90	
Revox B215	£1481.00	

Demonstration room facility
Part Exchange facility
Instant Credit facility

MUSICAL IMAGES VOUCHER

# £25 OFF

WHEN YOU SPEND £250 OR MORE!

Offer is not available on sale or special offer items

REEL TO REEL	Teac X300 RX2000
	Revox B77 MkII

MISC.	Yamaha DSR100	£329.90
	Yamaha DSP100	£399.90
	A&R Black Box I	£259.90
	Musical Fidelity Digilog	£399.90
	Proton AI3000	£649.90
Yamaha AST SC10	£599.90	

CD PLAYERS	Philips CD610	£159.90
	Nad 5320	£169.90
	Kenwood DP5010	£249.90
	Pioneer PD7300	£319.90
	Denon DCD920	£299.90
	Marantz CD605E	£349.90
	Kenwood DPX9010	£499.90
	A&R Alpha CD	£349.90
	A&R Delta 70.2	£549.90
	A&R Delta 170	£599.90
Pioneer PD91	£849.90	

SPEAKERS	JPW Sonata	£99.90
	A&R Red Box	£99.90
	Celestion 3	£109.90
	Wharfedale 505.2	£169.90
	Castle Durham	£199.90
	Heybrook HB100	£249.90
	Tannoy DC2000	£299.90
	Monitor Audio R352MD	£299.90
	Tannoy DC3000	£599.90
	Bose AM5	£499.90
Alphason Amphion	£579.90	
Spendor SP1	£699.90	
Bose 901	£1599.90	

TUNERS	Kenwood KT1010	£99.90
	Yamaha TX330	£119.90
	Nad 4225	£149.90
	A&R Alpha 2 Tuner	£164.90
	Rotel RT850AL	£179.90
	Pioneer F656	£199.90
	A&R Delta 80	£299.90
	Pioneer F91	£349.90
	Revox B160	£745.00

PRE-FOW AMPS	Quad
	Musical Fidelity
	Alphason
	Yamaha

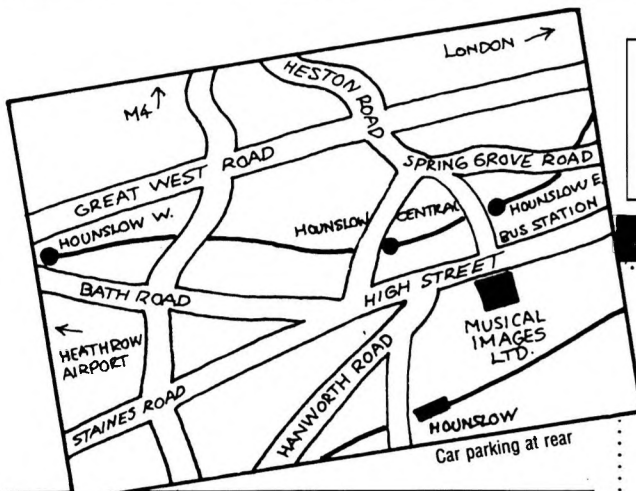
SPEAKER CABLES	
VAN DEN HUL	
MONSTER	
SUPRA	
QED	
A&R Livewire	

HEADPHONES	
STAX	
SENNHEISER	
BEYER	
AKG	
QUART	

CARTRIDGES	
A&R	
AUDIO TECHNICA	
GOLDRING	
NAGAOKA	
ORTOFON	
SHURE	
STANTON	

ARMS	
ALPHASON	
KUZMA	
SME	
ZETA (VdH wired)	
ROKSAN	

INTERCONNECTS	
MONSTER	
VAN DEN HUL	
QED	
DISCWASHER	
CHORD CO.	
A&R Livewire	



BUYING HI-FI EQUIPMENT FOR SCHOOLS OR COLLEGES?

Call and ask about the great deal we offer educational establishments!

## MAIL ORDER COUPON

Please send me the following \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

Telephone \_\_\_\_\_

I enclose cheque £ \_\_\_\_\_ Access/Barclaycard No. \_\_\_\_\_

Signature \_\_\_\_\_

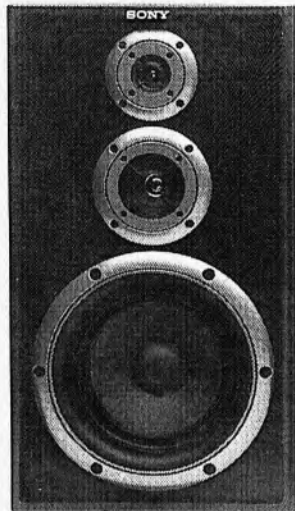
## EXPORT ENQUIRIES WELCOME

Carriage is only £6 per order and FREE if total exceeds £300 (UK mainland). All goods are insured against loss or damage in transit.

Please allow 28 days for delivery

# SONY COMPACT 701CD (711CD)

SONY UK LTD., SONY HOUSE, SOUTH STREET, STAINES, MIDDLESEX. TEL: (0784) 467000.



Like other up-market systems, this one is composed entirely from separates. However both the cassette deck and tuner derive their power from the amplifier, and communicate audio using ribbon cables. The inputs devoted to these components are not duplicated in phono sockets, so they might as well come in one box for all the increased versatility they provide, and this of course impacts on the possibilities for future upgrading. The CD player and turntable and – naturally – the loudspeakers are true separates, as is the graphic equaliser. The equaliser is supplied only with the 711CD system. The 701CD is an identical system *except* that there is no equaliser.

Despite the mutually dedicated nature of the constituent parts, I was surprised to find that real interaction between them is limited. You still need to select a source (eg CD) explicitly before starting play, and auto source selection isn't the only omission. No provision is made for synchronised recordings (though the CD player does have certain tape editing features which would make more sense if synchronised record was possible), and I also noticed there is no timer standby facility on the cassette deck.

If, despite these niggling criticisms, you find yourself tempted by the *Compact 711CD*, which is quite possible given its musical capabilities, you should ask your friendly neighbourhood Sony dealer to show you the *Compact 701CD* which is 9.5cm shorter, £100 cheaper and differs only from the 711 in omitting the graphic equaliser. In case you haven't got the message, this loss doesn't

impede functionality, indeed it leads to a slight improvement in sound quality as unnecessary circuits and cabling is banished from the signal path.

## PS-V701L TURNTABLE

This rather nominal attempt at record playing hardware design is a simple belt driven design in which a DC servo motor feeds a flat belt around the inner hub machined on to the one-piece featherweight alloy platter, topped as usual by a lightweight mat. The arm is pivoted and the magnetic cartridge somewhat imprecisely fixed at the end of the rather rattly wand Sony describes as a pick-up arm. Disappointingly Sony has turned its back on the industry standard *T4P* cartridge mounting standard, so a cartridge upgrade is rendered impractical.

Operation is fully automatic, though I admit I lost patience with the slow acting mechanism (as I often do with decks of this type) and tended to use it manually. Arm cueing and record size controls are fitted to the top plate, the other more often used controls are accessible from the front with the cover lowered. The deck has just satisfactory wow and flutter, but the cartridge is a mess. The frequency response shape in particular is little better than a joke.

## ST-V701L TUNER

Facilities parallel those on cheaper Sony tuners. There are 30 presets, accessed in three 'pages' using ten preset keys, the pages being selected using three keys labelled A-C. The page letter is echoed along with the preset

number in the well designed display area. Sony has abandoned its long term prejudice against proper aerial sockets, but still hasn't thought fit to supply a stereo/mono switch. Happily, off-air FM performance is very good.

## TC-V701 CASSETTE DECK

This is an attractive, fully logic controlled deck with two auto-reverse transports, one for the record and play, the other for play purposes only. Record levels are set manually – there are some short but neat record level meters to help – alongside the electronic memory tape counter display. Tape type selection is automatic. There are certain omissions, some of which are surprising in a system at this price level, including Dolby C, Dolby HX Pro and the ability to record on metal. There are no track search aids either, but a memory counter is available, and can be used to repeat randomly defined passages. Auto-reverse takes place only after the leader has wound past the heads, so there's an inevitable ten second or so gap during recordings that span this operation. The test results speak of a rather iffy transport quality – wow and flutter measures 0.25 per cent – and dynamic range is close to budget hi-fi cassette deck standards. Type II tape is a good electrical match, and playback of pre-recorded material is adequately handled.

## CDP-M77 COMPACT DISC PLAYER

The *CDP-M77* employs 18-bit converter and 8times oversampling technology, which

would have sounded truly avant guard a few months ago but suddenly seems almost old hat. An optical output is available, but isn't usable in this system. Random track selection can be made using the remote control or on the player. All the usual play, repeat (include A-B) and random play modes are present and correct, along with the ability to programme a 'pause' command (useful when taping) and a facility whereby the player will compile a program to sit the side lengths for the tape in use. This is of somewhat limited use with an auto-reverse recorder like the one fitted to this system, but is still helpful in avoiding tracks split across sides.

### SEQ-V901 GRAPHIC EQUALISER

The *SEQ-V901* is simplicity itself. There are just seven operating bands per channel, with associated bar graph displays which cannot be switched off. Finally, there's a simple bypass switch. No preset or user memories are fitted.

### LBT-V701 AMPLIFIER & SS-A701 LOUSPEAKERS

The amplifier is similar in concept to the *Compact 501CD* amplifier, though power output is just a little higher at a measured 30 watts/channel (slightly less at 20Hz) and there is a spare tape input labelled Video/DAT, though it could be used with any line level source. There's a microphone input too, along with a simple (and largely ineffectual) surround sound circuit, plus bass, treble and loudness, the latter rejoicing under the specious title DBFS.

The three-way sealed *SS-A701* loudspeakers are described more fully in the *501CD* review, and of course the same comments apply. The measured response shape isn't too encouraging, but there are worse.

### HOW IT PERFORMS

At the end of a quite protracted period of familiarisation, I felt that in an almost understated way, this system has considerable

musical integrity, without the sharp dips and bumps that prevent certain of its competitors being seen as good all-rounders, whatever their individual merits. Of course, some of the components are weaker than the others, and the cassette deck is a little unsteady sounding at times (significantly the *Compact 501* was better here) and rather coarse textured compared to the source from which recordings were made. Recordings were also noticeably lacking in three dimensional qualities. The play only transport was both more stable and open sounding, but some unsteadiness of pitch remained apparent. Record reproduction was similar to the cheaper Sony systems: lacking in weight and precision in the bass and offering slightly vague imagery, although it is nevertheless attractive, informative and above all, enjoyable. The mid-forward cartridge response is probably beneficial in as primitive an environment as the *FS-V701L*.

The other two source components were excellent. The CD player is capable of holding its own with a number of quite good budget hi-fi players, though it doesn't 'breathe' in quite as lucid a manner as the very best. It could be described as slightly dry, and so too is the FM tuner, which nevertheless performed to a high standard with a range of programme material. The combination of amplifier and loudspeakers doesn't get in the way. The amplifier is powerful and acceptably transparent; the loudspeakers are a little rough around the edges, and slightly shallow in the bass. They're bright too, but they work. In fact the system works.

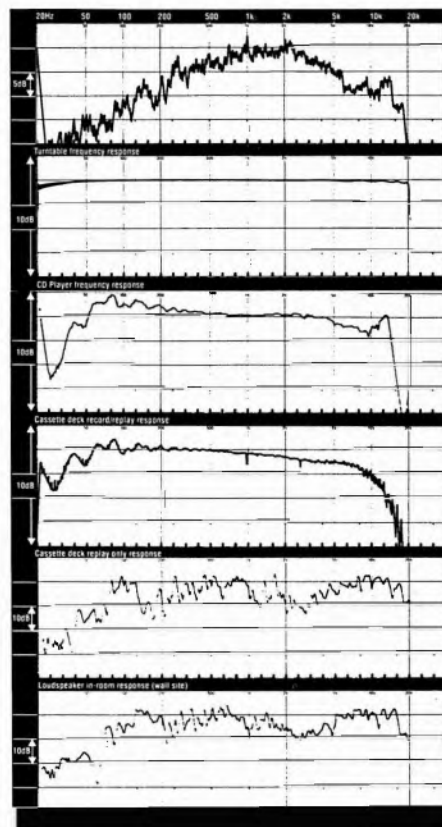
### VERDICT

The *Compact 711CD* can be ruled out straight away: the idea of paying £100 for the doubtful privilege of owning a graphic equaliser, especially the uninspired design included here, isn't appealing. The *Compact 701CD* is a different matter. The main problems concern such matters as the inability to record on metal tapes, the omission of a

mono switch for the tuner (this could be important) and the lack of co-operation in the control system. All the source components are at least adequate and at best good; the amplifier works and the system as a whole makes music. Recommended.

### TEST RESULTS

Cost with speakers	£700 (E800); without n/a
Options?	none
Size main unit	lid open, w/o projections 87 x 35.5 x 36cm (h x w x d) 43 x 24 x 19cm (h x w x d)
Size loudspeakers	
TURNTABLE	
Wow & flutter wtd	0.16%
Drift	average
Speed accuracy	+1.2%
Arm/cartridge resonance	too high
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	0.4dB
Cartridge channel separation	-30dB
Cartridge tracking ability	80µM
TUNER	
Sensitivity	very good
Signal/noise	very good
CASSETTE DECK	
Wow & Flutter (wtd)	0.25%
Signal/noise ref 0dB Type II	51dB
Distortion 0dB Type II	2.2%
COMPACT DISC PLAYER	
Signal/noise (measured at amp Tape Output)	100dB
AMPLIFIER	
Power output/channel (8ohms)	25/30/30watts
(20Hz, 1kHz, 20kHz both channels driven)	
LOUDSPEAKERS	
Efficiency	high



# CHRISTMAS PRESENTS

Wondering what to buy someone for Xmas – then surprise them and yourself with the improvements made to their Hi-Fi with our:

Super analogue Phono Stages	£ 89.00
Upgraded power supply	£ 69.00
Valve phono stages	£295.00
Audio Mains Cleaners	Basic £ 49.95
	Advanced £175.00



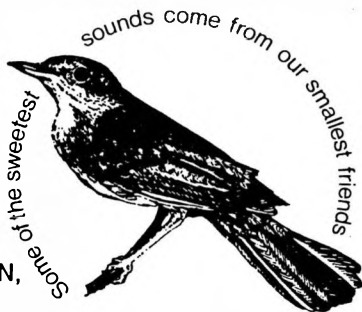
**Lynwood Electronics**

Coley Lane Farm,  
Wentworth,  
Rotherham,  
S62 7SQ.  
Tel: 0709 873667

## MUSICAL EVENINGS

EASTBOURNE  
23RD NOVEMBER, 8.00 PM  
SANDHURST HOTEL

# QUAD



BRIGHTON  
3rd DECEMBER,  
7.30pm, HOSPITALITY INN,  
(FORMERLY RAMADA).

PLEASE RING SHOPS FOR DETAILS/TICKETS

# Jeffries hi-fi

4 ALBERT PARADE · GREEN STREET · EASTBOURNE 31336  
69 LONDON ROAD · BRIGHTON 609431



3 demonstration rooms at each shop  
LATE NIGHT - WEDNESDAY - 8 PM. CLOSED MONDAYS

# READING HI-FI CENTRE

▶ You can tell a lot about Hi Fi dealers by the products they sell and we sell only the very best.

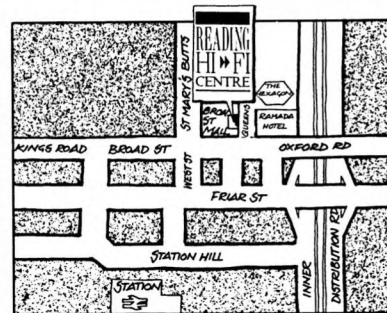
Our helpful staff have sound product knowledge and our comfortable demonstration rooms offer excellent conditions for you to hear quality Hi Fi at its best.

Listen to us and buy a better system.

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

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

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



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

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

CLOSED ALL DAY MONDAY  
OPEN THURSDAY TILL 8PM

DEMONSTRATION APPOINTMENTS ADVISED





**NORTHHERTS  
LEADING STOCKIST.**

# Hypertec

## *The A-91D Collection*

A system that Hypertec, as one of Pioneer's leading dealers, are proud to demonstrate.



There are those who believe that cassette is not truly a Hi-Fi medium. They have never heard the CT-91a. This is a cassette deck which can rival Compact Disc for speed accuracy, and is capable of recording and reproducing a wider frequency range.



The PD-91 has been acclaimed by the British Hi-Fi press as a CD player against which all others must be judged. We recommend that if you are interested in the best that compact disc can offer, you should audition this player.

The matching tuner, the F-91 is already a legend amongst the audiophile community and we would like everyone to know that this is simply the best tuner money can buy.



The A-91D has two massive power transformers, one for each of the channels. As a result, it will deliver full output into any loudspeaker that is likely to be connected. It has built-in digital to analogue converters, not only for Compact Disc, but also for DAT and it will keep on delivering its 150 watts per channel, thanks to a standard of construction that is very rarely seen in any field.

Established nearly 18 years ago, then as a specialist service company, Hypertec now offers a wide range of hi-fi, all of which can be demonstrated by our expert and friendly staff.

Just call in to our showroom to see and hear the very latest in hi-fi. Our listening rooms and exhibition suite are always open.

If you do not live in the vicinity please telephone and we will be happy to advise you.

**We have facilities for Mail Order and we are also experienced in Tax Free Exports.**

**Budget hi-fi Systems also stocked.**



# Hypertec

6-8, Bancroft, Hitchin, Herts, SG5 1JQ. Tel: (0462) 452248.

# TECHNICS X1

PANASONIC UK LTD., PANASONIC HOUSE, WILLOUGHBY ROAD, BRACKNELL, BERKS. TEL: (0344) 862444.



The Technics *X1* system replaces a system called the *X920*. Although we haven't covered the latter, it's still interesting to look at how the *920* was transmogrified into the *X1* in order to cast some light on current thinking, within the Technics empire at least. The *X1* has speakers now described as 'hi-fi' designs (the old ones weren't), whilst the cassette deck has sprouted manual in place of automatic record level setting (and where else indeed?). The turntable is also now described as hi-fi. The use of the term hi-fi in this context is euphemistic and probably inappropriate, though this is always a matter of judgement. The point however, is that *using Technics' own criteria* (and it doesn't matter here what they are as long as they have remained consistent throughout) an improvement has been wrought, and not just a change for change's sake.

Those anticipating the easy life by buying a midi system rather than separate components may be surprised to discover that around the back, the wiring is nothing less than an impenetrable mess. The basic signal and loudspeaker wiring follows the familiar rules, though the speaker terminals are those dreadful clamps that always seem to be either too big or too small for the job. The linked features (automatic source selection, the distribution of remote control commands etc – yet, the system comes with a remote control capable of addressing all major functions directly) is handled by a patchwork quilt of ribbon and coaxial cable links, often poorly described in the manual and on the equipment.

Although each component in the *X1* system is housed separately from its neighbour, the cassette deck is not truly independent of the amp, as it derives its power from the latter. All signal cabling is accomplished using the usual phono interconnects, and so the only limitation when considering a future upgrade is that if the amplifier is to be changed, the cassette deck will have to be changed at the same time. And why not?

## SL-J110R TURNTABLE

The deck is belt driven, has a *T4P* fit interchangeable cartridge, and is fully automatic, including record size sensing (using the belt and braces technique of sticking little feelers through the mat). The controls are all accessible on the front of the player. Although Technics claims to have some anti-resonance material in the construction, the reality is that it's a typically wobbly flexi-plastic construction, and no less excitable than most of its peers.

On the other hand, Technics has tried to eliminate any trace of bass from the design (the usual approach pursued as a substitute for decent, solid engineering in the first place) and the cartridge also shows some promise. The frequency response for example is OK. The plot shows reasonable extension into the bass and a slightly shy treble, though channel balance is poor and tracking ability limited, which was occasionally audible with some heavily modulated choral recordings and close miked chamber music. Turntable wow and flutter measures below par, though wow components are fairly low

and the deck sounds more stable than you might suppose.

## ST-X933L TUNER

This is a nice, understandable synthesiser model with a clear, attractive display and 24 random presets and three operating wavebands – FM, MW and LW. All the usual facilities are available including stereo/mono switching. Ten numeric keys access the presets, in the case of double digit numbers by selecting one or two, and inputting the second digit during a timed pause which could prove annoying when selecting presets one and two. By budget tuner standards of air performance is excellent, sensitivity is high and interference and noise low right across the band. The AM bands too, were unusually free of interference.

## RS-X911 CASSETTE DECK

Technics' promoting of this deck as an 'auto reverse double cassette deck' is somewhat disingenuous given the facts, which are that of the two transports, only the record capable one has auto reverse. The other has a simple unidirectional playback mechanism, which imposes certain constraints on system capabilities. For example you cannot dub a complete tape without manually reversing the source tape at the end of side A, though the deck's electronics help by automatically halting the recording.

The deck is equipped with Dolby B but not Dolby C, and automatic tape selection. Metal (Type IV) tapes are allowed for recording, which isn't always the case at this end of the

market. The deck is controlled by good quality light touch, logic interfaced controls. Audible cueing and a simple mechanical tape counter for the record capable transport are the only tape search aids. The deck behaves well on all counts, coming fairly close to low-end real high fidelity standards.

## SL-PJ26A COMPACT DISC PLAYER

Like most of the other components in this system, the *SL-PJ26A* is simple and well-engineered. It offers all the usual disc search, play and programming features from audible cueing through to 20 track programming. The deck also includes a range of tape editing features which help make recordings by halting the tape transport after the last complete track that fits the current side has been recorded until the tape is turned over and repositioned (if necessary). More complex linking facilities for use when copying on to tape are also available.

## SU-X911 AMPLIFIER & SB-F911 LOUSPEAKERS

System manufacturers seem to have given up quoting power ratings which have any foundations in the kind of numbers that hi-fi equipment plays by. Technics' claimed 40watts/channel (DIN 8ohms) retranslates into 25 real watts/channel. The amp uses Technics' variant of pseudo Class A output stage. Features include one spare input, a 'super bass' control to augment the standard bass control (see later) and a very basic surround sound system of no real merit – it merely seems to add some presence boost when used with just the two main speakers.

There's little that can be said about the loudspeakers. They're simply but nicely finished, with one attractive touch in the form of rounded off front edges to remove the bluntness that is a feature of most loudspeakers. The enclosure is much heavier than most comparably designed system loud-

speakers, and size itself is an issue. Technics has avoided the usually disastrous trap of providing the biggest box possible for the money. The system itself is sealed, the front opaque covers permanently fixed in place. There are two drive units, described simply as a 16cm woofer and a 2.5cm cone tweeter, and they're recessed behind the front panel, a construction technique that has its root in a desire to save on manufacturing costs.

## HOW IT PERFORMS

In a nutshell, the answer to the 'how' side of the question is 'brilliantly for the price'. I was delighted and at times even astonished by the capabilities of this system. Naturally there were weaknesses. The loudspeakers lack depth in the bass, and attempting to reinvent it using the 'super bass' control is doomed. The latter isn't restricted just to the very low frequencies (as claimed), but shows considerable overlap into the midband. Using boost here merely makes the system sound woolly, and in extremis, boomy.

But most of the inevitable compromises represent reasonable trade-offs at the price. So low are prevailing standards within the midi system industry, I generally count myself lucky if a system doesn't have gross wow and flutter, terminally unpleasant loudspeakers or something equally crass. This one has a cassette deck which lacks focus and sounds a bit waffly in the bass, but it does keep a steady pitch (yes, even the auto-reverse transport), and it makes pleasing recordings with TDK SA especially (don't bother with metals).

The turntable is pretty good too. The cartridge can sound a tad fierce at times, but it isn't totally out of control, and it doesn't spoil a lively, stable and enjoyable standard of music making with stereo soundstaging, dynamics and clarity and enough of a sense of musical nous to give the CD player a good run for its money. The tuner is well up to the standards of the rest of the machine, and the amp/speaker combination, bass apart, is

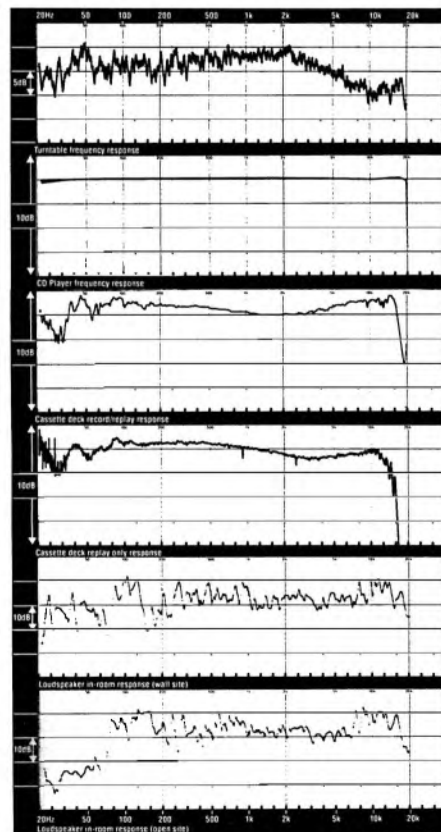
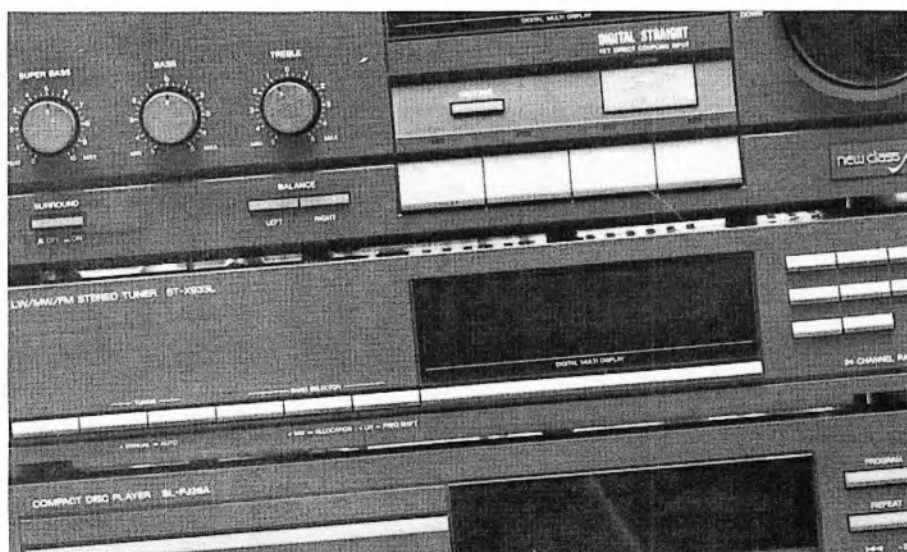
clean and open. Although it's perhaps slightly monochromatic tonally, the system is transparent enough and informative enough not to get in the way.

## VERDICT

First rate at the price, this is classic Best Buy material. It's a purposeful, relatively ungimmicky product where musical integrity has taken precedence over other qualities. Would that they were all made this way...

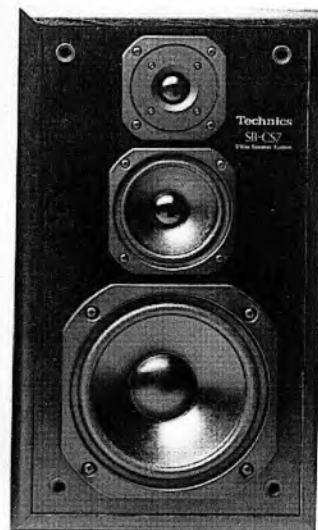
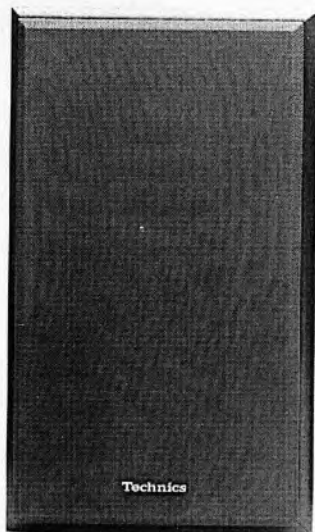
## TEST RESULTS

Cost with speakers	£500; without n/a
Options?	CD player (£149.95), SH-E65 graphic equaliser
Size main unit	74 x 36 x 33cm (h x w x d) Id open, w/o projections 39 x 23 x 20cm (h x w x d)
Size loudspeakers	
TURNTABLE	
Wow & flutter wtd	0.25%
Drift	average
Speed accuracy	+0.3%
Arm/cartridge resonance	too low
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	1.5dB
Cartridge channel separation	-30dB
Cartridge tracking ability	48µM
TUNER	
Sensitivity	good
Signal/noise	good
CASSETTE DECK	
Wow & Flutter (wtd)	0.19%
Signal/noise ref 0dB Type II	53dB
Distortion 0dB Type II	0.45%
COMPACT DISC PLAYER	
Signal/noise (measured at amp Tape Output)	95dB
AMPLIFIER	
Power output/channel (8ohms)	14/24/25watts
(20Hz, 1kHz, 20kHz both channels driven)	
LOUDSPEAKERS	
Efficiency	below average



# TECHNICS X5D

PANASONIC UK LTD., PANASONIC HOUSE, WILLOUGHBY ROAD, BRACKNELL, BERKS. TEL: (0344) 862444.



This is one of the grown up Technics systems. There are a number of parallels with the *X1* system (reviewed separately), not least a very purposeful, un gimmicky user interface, snappy but still traditional styling – and the messiest, most complicated wiring around the back I have ever come across. Never mind, when you do get it wired and fired up, you'll find you have a well equipped system with all mod cons: full remote control, auto source selection, synchronised recording from record and CD and more . . .

However, one of the key selling points plugged for this product is specious. The amplifier (trumpets the glossy brochure) is a digital amplifier, which is something of a terminological inexactitude, but insofar as there is any truth in this at all, it is positively not a selling feature. What Technics has done is to provide a direct digital input in the amplifier which can be fed by the equivalent output on the CD player using an optical fibre link. The reason for performing the conversion outside the CD player is based on the idea that digital and analogue voltage signals should be kept well apart, which is certainly justifiable on all kinds of admittedly fairly esoteric technical grounds. But placing the converter in the amplifier amounts to no more than a leap from the fat into the fire. If there is any perceived improvement in sound quality (see later), then we need to look elsewhere for the reasons.

## SL-J110R TURNTABLE

This is the one and only component shared with the *X1* system, and the story is a short

one. The cast of characters – fully auto operation, thinly sliced alloy platter and rubber mat, belt drive and pivoted arm – all are familiar fare. A *T4P* fit magnetic cartridge is the final ingredient, the one that makes it go. According to the test results, the cartridge has a tolerably good response shape (though the top end droop is fairly pronounced) along with good tracking and channel balance. The motor unit is more stable than most system players, rounding off a decent package on a positive note.

## ST-X999L TUNER

On one level, this is a straightforward three band digital tuner, with the rather minor exception that there are 28 random presets, not 24. As usual coverage is FM stereo, MW and LW. As a tuner it's a decided success, offering excellent RF performance and freedom from hiss – on AM as well as FM by the way. In its alternative existence, the *ST-X99L* also acts as a timer. Three timers in fact: a one-event timer, a weekly timer and a sleep timer. This is the key to a range of features, including the ability to convert this £800 box of miracles into an overweight bedside clock radio.

## RS-X980 CASSETTE DECK

The cassette deck is a beneficiary of the system timer described above, which it exploits for absentee recording purposes. But the deck is a powerful one anyway, with a veritable wish-list of features. As usual, one of the two transports is for playback purposes only, but both offer full optically triggered auto-

reverse operation (which switches tape direction at the tape/leader junction – an unexpected and welcome sophistication in a midi system cassette deck). Noise reduction circuits include the powerful Dolby C as well as the ubiquitous Dolby B. There are two track search features: an electronic tape counter which can be assigned to either transport at will, and a simple next/current track search feature. All the traditional normal/high speed dubbing and sequential play options are provided.

The deck's layout is much less user-hostile than usual, and as with any deck with pretensions of good sound, recording levels are set manually, with the aid of neat 23dB column meters. Performance on the test bench is to a high standard, wow and flutter is just 0.10 per cent wtd, whilst noise and distortion figures imply a wide working dynamic range. Frequency responses are also near textbook standard. What more can you ask?

## SL-PJ46A COMPACT DISC PLAYER

The player has its own remote handset for full functionality from the comfort of your favourite functionary's lap, though basic operating features also appear on the system handset. Random track access is available on the player and both remote controls, and the overkill continues through to the display which has many thermometer and calendar read-outs and other indicators. Quite a bit of software is dedicated to dubbing from CD to tape. Assistance is provided in various forms,



all centred on the idea of telling the CD player the length of the tape in use and allowing the electronics to appropriately shuffle and divide the disc contents, if necessary tacking the contents of a second or subsequent disc on to the end of the first.

## SU-X955 AMPLIFIER & SB-CS7 LOUSPEAKERS

The amplifier looks surprisingly discreet for a unit which has considerable power and flexibility. Seven inputs are available altogether, two being digital. Perhaps more correctly, one is a DAT circuit which is accessed through an optical link. The other, a CD input also fitted with an optical link, can be switched over to behave as a standard analogue input. A patch is also available (in effect fitted between the pre and power amplifiers) which can be used with the optional graphic equaliser, or some other kind of processor. One example might be a surround sound processor if the so-called surround circuit built into the amplifier leaves you hungry to discover what good surround sound is really like. The built-in circuit is adept only at destroying any illusion of clarity and focus, by adding a wholly false extra sense of presence. Two pairs of speakers can be driven, but on an either/or basis, the implication being that the amplifier isn't robust enough to cope with two circuits simultaneously.

The SB-CS7 is almost built like a high fidelity loudspeaker. The enclosure is reasonably compact and solid, with rounded off front edges - presumably to improve aerodynamics. There are three apparently well engineered drive units, including a tweeter, wired through a crossover. Most system loudspeakers content themselves with a capacitor, or capacitor/resistor network, to protect the tweeter from damage. However, Technics has done little to damp the enclosure internally, and the midrange unit has an integrally sealed back rather than working into its own subenclosure. Measured per-

formance looks good, especially in the mid and high frequency area.

## HOW IT PERFORMS

The tape deck is a good one within certain limits, one of the more obvious ones being its inability to make recordings on metal tapes that weren't bright, thin and, well, neither realistic nor pleasant. But the tables were well and truly turned with Type II tapes like TDK SA, which provided well lit, subtle and involving recordings, with more than adequate detail and a high standard of pitch and output level stability. The turntable also performed a little better than anticipated, in line with the comments in the XI review, viz: a little bright, but stable and even extended in the bass, though LF excitability is more obvious in this system with the greater LF response available from the loudspeakers.

The tuner and CD player were better. Neither quite matches the standards of a good budget or near budget hi-fi separate in the same broad category, but both come close, and might even be mistaken for them under certain circumstances. And yes, the CD player did sound a little better using the DAC in the amplifier. Instrumental separation and (most important) the solidity and depth of stereo imagery were superior.

As the cassette deck, CD player, tuner, and even the turntable performed so creditably, most of the overt character in this system comes from the loudspeakers, and to a certain extent from the amplifier. The latter I felt was simply lacking in class. It sounded clear and clean, yet it has surprisingly little visceral strength - presence if you like. Even compared to a good budget amplifier it sounded rather flat and lifeless. It's not much below normal standards as system amplifiers go though, and in context it's probably good enough. Finally, the loudspeakers are surprisingly good. Their bass is deep and pleasant, though not ideally focused or solid. The treble is clean and airy if slightly reticent, and the midband is mostly good too,

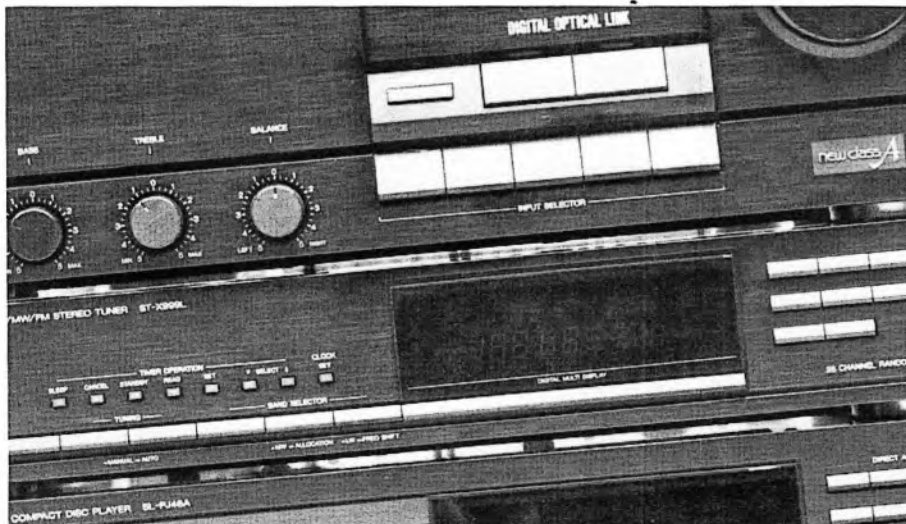
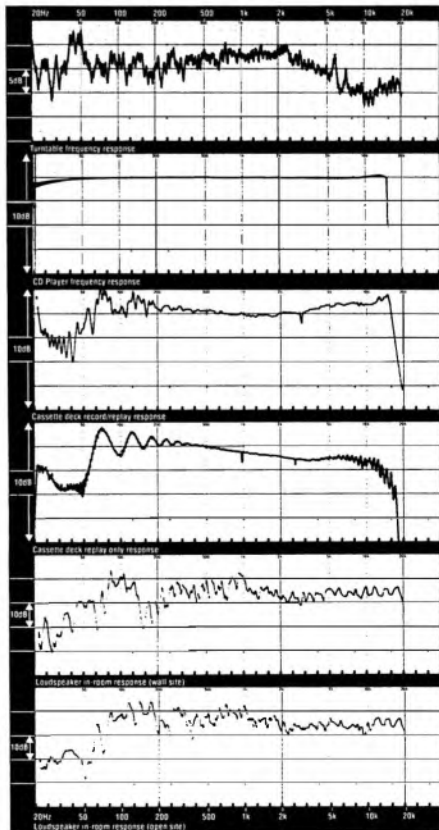
apart from a trace of muddle with complex material, especially at high volume levels.

## VERDICT

Although in relation to its price not quite as impressive as the XI system, in absolute terms it's significantly better, and it's well in line with the best at the price. This is a safe, attractive and capable system, and well priced into the bargain, if you see what I mean. Recommended.

## TEST RESULTS

Cost with speakers	£800; without n/a
Options?	CD player (£199.95), SH-E65 graphic equaliser, SB-S30 AV Surround rear speaker system
Size main unit	lid open, w/o projections 76 x 36 x 33cm (h x w x d) 46 x 26.5 x 24cm (h x w x d)
Size loudspeakers	
TURNTABLE	
Wow & flutter wtd	0.17%
Drift	good
Speed accuracy	+0.3%
Arm/cartridge resonance	OK
(<10Hz too low, OK, >14Hz too high)	
Cartridge channel balance	0.2dB
Cartridge channel separation	-28dB
Cartridge tracking ability	80µM
TUNER	
Sensitivity	good
Signal/noise	good
CASSETTE DECK	
Wow & Flutter (wtd)	0.10%
Signal/noise ref DdB Type II	51.5dB
Distortion DdB Type II	0.65%
COMPACT DISC PLAYER	
Signal/noise (measured at amp Tape Output)	98dB
AMPLIFIER	
Power output/channel (8ohms)	30/38/35watts
(20Hz, 1kHz, 20kHz both channels driven)	
LOUDSPEAKERS	
Efficiency	medium



# SEVENOAKS HI-FI & VIDEO

This advertisement is valid until at least 30th November 1989. Please note: Beckenham, Chatham and Woolwich close all day Wednesday.

## SUGGESTED SYSTEMS

The suggested systems priced below all include the popular Dual CS503/1 turntable, but an alternative turntable or CD player is available at extra cost. Please see "OPTIONS" list below for further details.

### SPKERS

All system prices include the Dual CS503/1 AMPS

### AUDITION THE SUPERB RANGE AT SEVENOAKS HI-FI

### MISSION 761 £119.95

INC. PRICE OF STRAND CABLE

### MISSION 762 £179.95

INC. PRICE OF STRAND CABLE

### MISSION 763 £279.95

INC. PRICE OF STRAND CABLE

### MISSION 764 £399.95

INC. PRICE OF STRAND CABLE

### MISSION 765 £599.95

INC. PRICE OF STRAND CABLE

M/Short MS10 II Goodmans Marim II W/late Delta 50	274.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
W/late Diamond III Celebration 3 JPM Sonata Goodmans Sterling 8 Pa. 3 Mission Roly 17 M/Short MS 3.0	284.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Rotel RA8201 RA8201B3 RA8201B3 Nad 3020E	274.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Nad 3130	289.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Rotel RA840B3 RA840B3 Nad 3020E	289.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Rotel RA810A	299.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
QED A240CD II	274.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Yamaha AX330	309.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Arcam Alpha II	429.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Rotel RA8708X	364.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Kenwood KA3010	289.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Nad 3225PE	279.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Marantz PM45	354.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Kenwood KA5550	279.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Denon PM250	279.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Musical Fidelity B1	354.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Heyron HB1 Castle Downham Celebration DL8 II M/Audio R252MD Rogers (SAA) (see 2.2)	364.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
Tonroy M15 Castle Harwick Wharfedale 505.2 Mission 762 Monitor Audio P8	339.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95
M/Audio R300MD Tonroy M20 (B4) Heybrook HB100 Alec Hiem 24 Tonroy DX 2000 (see 1.50) M/Audio R352MD (see 1.50)	364.95	319.95	299.95	389.95	324.95	339.95	374.95	364.95	389.95	354.95	409.95

## OPTIONS

The following Compact Disc Player or Turntable may be ordered instead of the Dual CS503/1 in the above systems.

### CDS

- Arcam Alpha CD
- Denon DC0550
- Denon DC0520
- Denon DC0570
- Denon DC040
- Marantz CD50
- Marantz CD50SE
- Marantz CD60
- Marantz CD60SE
- Marantz CD60SE
- Nad 5320
- Nad 5325
- Philips CD82
- Philips CD810
- Philips CD782
- Yamaha CDX150
- Yamaha CDX150
- Yamaha CDX150
- Rotel RC0820B
- Sony CDP-855
- Technics SL2002
- Technics SL222
- Technics SL253
- Technics SL255

### TURNTABLES

- Dual CS505.3
- Dual CS450
- AR TB 101
- Nad 5120
- Revolver Reibel
- Systemdek inc. arm
- Systemdek inc. arm
- Arston 100N
- Thorens TD20 II
- Thorens TD166

## SAVE

Massive savings when you buy a suggested system — each component has been highly acclaimed by the UK Hi-Fi press and as a package offers unbeatable value for money.

## FREE

Cartridge supplied with these systems. Carriage for mail order customers of all systems in excess of £250 (UK mainland only).





# YAMAHA AST-C10

YAMAHA ELECTRONICS UK LTD., YAMAHA HOUSE, 200 RICKMANSWORTH ROAD, WATFORD, HERTS WD1 7JS. TEL: (0923) 33166.



CD midi systems may vary in all sorts of ways, yet certain conventions have always had a status approaching the sacrosanct. One of the most pervasive is that to a first approximation, they're all designed to emulate a vertical pile of hi-fi components, even if it only costs three-and-sixpence from the local cut-price shop. One of the problems this causes is that many systems are a good deal larger and clumsier than they need to be, and a quite different kind of audio system has become popular in recent years – the much maligned species often known as the ghetto blaster. The genesis of this breed was the portable radio cassette, and although the average modern ghetto blaster has put on weight, buttons and power, the essential qualities and values of the bits that lay under the skin are identical in spirit to the modest antecedents of old.

The Yamaha is amongst the first of a new breed, and is a true 'clean sheet' design that owes nothing to what has gone before. Although first impressions from a distance may suggest that the *AST-C10* is just another ghetto blaster, closer examination quickly shows that it's meticulously engineered. The displays are attractive and practical, the controls are rationalised with unnecessary ones weeded out altogether. This is also a mains only system. Some may find certain of the controls too small or close together for easy handling, and there are some clumsy touches – the distance between the equaliser and extra bass switch being one. On the whole, though, the system breaks new ground for user friendliness. And for those who like to

keep friendliness at arm's length, there's a 35-key remote control.

The system employs one important new item of technology called 'Astarte'. Astarte addresses the problem of extracting deep bass from small enclosures, and it does so in a novel way. In any Astarte system, the amplifier and loudspeakers are engineered specifically for each other – no change of loudspeakers is feasible. The amplifier has a servo circuit that manipulates the LF output impedance of the power amp, ultimately down to negative values, in such a way that response stays accurate down to a claimed 40Hz, though drive cone excursion limiting in the speaker prevents this happening at very high volume levels.

## MAIN SYSTEM UNIT

For once, the story of this system isn't the story of its features. It lies in the exacting nature of the design, and in the technology that makes it tick. Nevertheless, the Yamaha is far from being poorly equipped. The list is uncannily close to that of the Sharp *CD-X17*, barring proprietary bits and pieces like Sharp's 'back to back' tape mechanism, and Astarte of course.

The *AST-C10* can make absentee recordings, wake you up or put you to sleep using a built in clock/timer. The amplifier gives about 15watts/channel before significant waveform clipping sets in. This is less than Yamaha claims, but the Astarte circuit makes the figures unreliable, and the available power output turns out to be sufficient, as will be demonstrated. The amplifier is

equipped with a four band tone control section described with typical hyperbole as a graphic equaliser. There's a bass boost switch too, which in most circumstances (not all) is best avoided. The amp has an auxiliary input which will accept any line level source, and outputs for loudspeakers (via DIN sockets) and headphones. In one of the few departures from the Sharp list of attributes, the Yamaha makes no pretence of being a surround sound system.

The tuner is a digital synthesiser type, equipped with normal socketry on the rear end with 20 FM and 10 MW/LW presets. The display matches the CD player one, and is positioned alongside, and also acts as a counter display for the cassette deck. Mono switching is available. The cassette section is built around two auto reverse transports, only one of which is capable of recording in the time honoured way. Auto level control, Dolby B and manual tape type switching figure prominently, but it's also worth noting that the transport sections are fully logic controlled, and that the tape counter itself is electronic rather than mechanical, and keeps track of both transports simultaneously. A simple track search feature is built in, and the deck is capable of making automatically cued recordings from CD.

The tape section allows tape-to-tape dubbing at normal speed only (good!) and sequential play. The auto level control circuitry inhibited some of the measurements, but mention must be made of wow and flutter, which measured 0.80 per cent on the first sample supplied, and 0.50 per cent on the



second (the first died of a faulty CD player, and was replaced).

However, pride of place goes to the CD player, which has the top central position on the system and is loaded from above. Associated with the player is a superb – and I mean superb – yellow backlit LCD display giving time, track numbers and a full calendar style read-out. Random track access is available from the remote handset, and audible cueing is available somewhat clumsily via 'pause'. An intro-scan feature plays the first ten seconds of each track, and programming is possible for up to 20 tracks. Signal/noise performance is exemplary, whilst the frequency response plot shows some mild emphasis at the frequency extremes.

## AST-SC10 LOUDSPEAKERS

The speakers clip on the side of the main unit if required, for example when carrying around, but for serious use must be detached and spread out. They can be placed on some small tripod stands which are thoughtfully provided for the purpose by Yamaha, and can be used on bookshelves or stands, preferably not hemmed in too much. The speaker itself is a two-way reflex system totally dedicated to the system amplifier, and is elaborately shaped and more than routinely well-built. The response shape confirms a high standard of acoustic engineering, and also confirms that bass output (under half space conditions) stays flat to below 50Hz, which is nothing short of remarkable for a system this small. The Sharp system already mentioned has significantly larger loudspeakers.

## HOW IT PERFORMS

Although I don't think it's the most important feature by a long way, it has to be admitted that the Astarte bass reinforcement system does work. There were times when the Yamaha sounded a touch woolly and underdamped in the bass, but it was always deep and powerful, adding immeasurably to the stature of the already very precise, articulate

stereo imagery, and also adding sonority and expressive range to the system's reproduction of tonal colour. And it can go surprisingly, even indecently loud, without loss of euphony and, to a greater extent than I had thought possible, without loss of bass depth and weight.

However, the system's key points lay elsewhere – it offers an open window on the music being reproduced. Clarity and resolution are of a very high order, and this remains the case even if the treble is turned down slightly to approximate a neutral frequency (tonal) balance.

There was a down side to this, too. At times the system could take on an overtly busy, edgy quality. For example there was an occasional lack of repose during the quieter moments of Elgar's *Nimrod* from the *Enigma Variations*. There was also more than a suggestion of coarseness and lower midband coloration. At the same time, the system was frequently almost chillingly effective. I recall one favourite piece, Ravel's impressionistic *Le Tombeau de Couperin* which I have only occasionally heard sounding more magical, even on systems costing several times as much.

The CD player and FM tuner are almost interchangeable musically. Objectively they may well not be state-of-the-art, even by packaged system standards. Indeed the tuner was a little noisier and edgier than I would have liked. But everything I have written in the previous paragraph applies with both these sources. The cassette deck is the only significant let down, and only because of the dreaded lack of pitch stability implied in the figures. In practice the loss of precision wasn't as severe as the numbers suggested, possibly because of the distribution of wow and flutter artefacts, but perhaps also because tape to head contact was more stable than usual. But the loss of sound quality was quite unmistakable, which is the more galling as the inherent standard of the deck appears to be good, with little waffle or

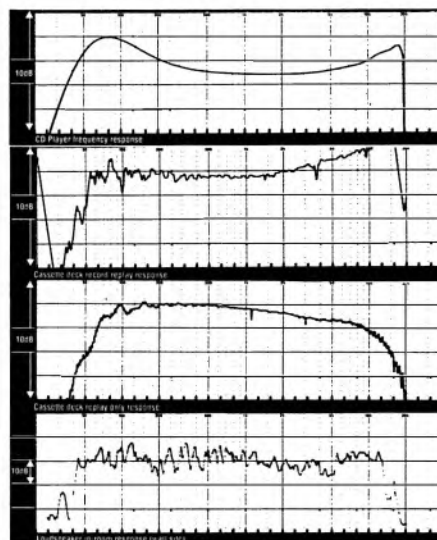
smear. Dynamics were also pretty fair given the automatic level control.

## VERDICT

In this system Yamaha has one of the very few designs in its part of the market that is truly more than the sum of its parts. There were times when I was playing this system that its standard of music making was little short of exquisite, though there were real limitations of course, and genuinely wide ranging material could drive it beyond its capabilities. However, my overall assessment is that although expensive, the *AST-C10* is genuine hi-fi in all departments other than the cassette deck. Even this component isn't without merit. I'd like to see Yamaha tackle this shortcoming ASAP, but even so, a recommendation is obligatory subject to a personal audition. Recommended with bells on.

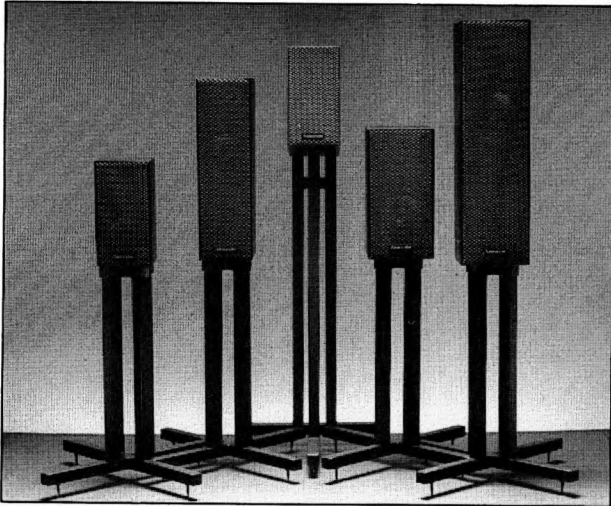
## TEST RESULTS

Cost with speakers	£600; without n/a
Options?	none
Size main unit	27 x 30 x 29.5cm (h x w x d)
Size loudspeakers	23 x 32.5 x 23.5cm (h x w x d)
<b>TUNER</b>	
Sensitivity	good
Signal/noise	good
<b>CASSETTE DECK</b>	
Wow & Flutter (wtd)	0.50/0/80%*
Signal/noise ref 0dB Type II	n/a**
Distortion 0dB Type II	n/a**
*see text	
**auto level control	
<b>COMPACT DISC PLAYER</b>	
Signal/noise (measured at amp Tape Output)	94dB
<b>AMPLIFIER</b>	
Power output/channel (8ohms)	15/14/17watts***
(20Hz, 1kHz, 20kHz both channels driven)	
***see text	
<b>LOUDSPEAKERS</b>	
Efficiency	medium



# ALEXANDER GREAT FOR GIFTS

Telephone for nearest dealer



**Presence Audio**

**The Old Posthouse, Plummers Plain,  
Horsham, West Sussex RH13 6NU.**

**Tel: (0403) 891777/8/9**

**Fax: (0403) 891747**

UK Distributor: Alexander, Cadence, Decca, Glanz, Interface, Kiseki, London, Miltek, Odyssey, Opus 3, SAE Spica, Sterling, Vecteur, YBA, ZYP  
World Distributor: Alexander, Cadence, London, Sterling, ZYP



FOR YOUR EARS ONLY

SPEAKERS	From	AMPLIFIERS	From	CD PLAYERS	From
Alexander	£139	Audio Innovations	£425	Carver	£359
B&W	£99	Beard (valve)	£359	Denon	£109
Carver	£2350	Creek	£179	Marantz	£199
Castle	£129	Hafler	£580	Nakamichi	£395
Celestion	£99	Kelvin Labs	£349	Phillips	£129
Gale	£149	Musical Fidelity	£199	Rotel	£249
Heybrook	£129	Marantz	£129	Sony & ES Range	£159
Infinity	£119	Proton	£99	Yamaha	£169
J.P.W.	£99	Quad	£564	<b>CASSETTE DECKS</b>	
Mission	£119	Rotel	£109	Denon	£129
Musical Fidelity	£199	Sony & ES Range	£99	Nakamichi	£395
Mordaunt Short	£89	<b>TUNERS</b>		Rotel	£129
PROAC	£329	Creek	£189	Sony & ES Range	£89
Quad	£1539	Carver	£695	Yamaha	£119
Ruark	£219	Musical Fidelity	£249	<b>TURNTABLES AND ARMS</b>	
S.D.Acoustics	£295	Quad	£309	Alphason	£419
Snell	£499	Rotel	£119	Ariston	£165
Spendor	£297	Sony & E.S. Range	£99	Dual	£85
Tannoy	£129			Systemdek	£169
				Oracle	£995

Come and listen to some of the 'What Hi-Fi?' Award winners for the year 1990...Budget Amplifier Musical Fidelity B 1, Compact Disc Marantz CD50ST, Cassette Deck Rotel RD 865 Loudspeaker J.P.W. Sonata.

Free Delivery (Mainland UK)  
Single Speaker Dem. Room

**35-37 MARSHAM STREET, LONDON SW1P 4LA**

**Tel: (01) 233 0774 Fax: (01) 233 0773**

The  
**Sound  
Shop**

**For:**

**58 THE BROADWAY,  
MILL HILL,  
LONDON NW7 3TE  
Tel: 906-3364/3680**

**CHOICE HI-FI**

**AIWA, A.R., ARISTON, AUDION, ALLISON, ALPHASON, B&W,  
CASTLE, CELESTION, CITATION, CONRAD JOHNSON, DENON, DUAL,  
HARMAN KARDON, HELIUS, INCATECH, JBL, JPW, KUZMA, KENWOOD,  
LYNX, MARANTZ, MONITOR AUDIO, MUSICAL FIDELITY, NAD,  
NAKAMICHI, NVA, ONKYO, ORELL, PIONEER, PORTON, QED, REVOX,  
RUARK, REVOLVER, SD ACOUSTICS, SYSTEMDEK, STAND DESIGN,  
TANNOY, THATS, THORENS, TOWNSHEND, VECTOR, VAN DEN HULL,  
WHARFEDALE, MONSTER.**



# TECH TALK

*Every review includes a table of laboratory test results. This chapter explains how each test was carried out and how to interpret the results.*

This section describes the measurements, in the order in which they're listed with each review. Occasionally it proved necessary to alter the procedure, especially where the system concerned lacked the usual inputs and outputs, making it difficult to connect the test gear. In general, these alterations are described within the reviews themselves.

**Dimensions and prices:** We have given dimensions of the stacked system components with the turntable (if fitted) lid up, and of the speakers. Prices quoted are typical retail prices including VAT.

## AMPLIFIER

**Power Output:** The figures presented are the RMS output in watts with both channels driven together to a point immediately prior to amplifier output waveform clipping at 20Hz, 1kHz and 20kHz. Equipment used: Dual beam oscilloscope, dual 8ohm dummy load and Nakamichi *T-100* audio analyser, both for generating the sine wave signals and displaying the output on its wattage scale.

## RECORD DECK

**Speed variations (wow and flutter):** The measurement given is peak DIN-weighted, as measured using a 3kHz recorded tone from HFS 75 and a Kenwood w&f meter.

**Speed drift:** This is an assessment (not a measurement) of long-term drift (low-rate speed variations) using the same test set up as above.

**Speed accuracy:** percentage error, derived from tests using the Ortofon *TC 3000* test computer. The more accurate, the better – although of course a slightly incorrect speed is less serious than appreciable speed variations.

**Arm/cartridge resonant frequency:** This is the average vertical/lateral resonance, also derived from the Ortofon *TC 3000* test computer. This frequency is related to the mass of the arm and cartridge, and the stiffness (compliance) of the cartridge cantilever (the thin rod that supports the stylus at its visible end, and which is secured loosely

at the other end). Very low figures, below about 8Hz, may cause the cartridge to be easily disturbed by problems such as warped records, and (where fitted) turntable spring suspensions. Sound quality may suffer – pitch reproduction can become unstable and low frequencies generally may become muddy and ill-defined. Too high a frequency – above about 16Hz say – may result in a rather fluttery and under characterised bass. The 'ideal' range is 10-14Hz.

**Cartridge channel balance:** Again derived from the Ortofon *TC 3000* test computer. The smaller the difference between the two channels the better, of course.

**Cartridge channel separation:** The figure indicates the amount of left hand channel signal appearing on the right hand channel output – or vice versa, the 'worst case' figure being quoted each time. The higher the figure, the better the result. Test equipment again was the Ortofon *TC 3000*.

**Cartridge tracking ability:** This figure indicates the highest recorded velocity the cartridge can track at the quoted tracking force – so the higher the figure the better. The measurement is not a comprehensive test of tracking ability, but it gives a useful general indication. Any perceived shortcomings in tracking ability on music programme have been commented upon separately.

**Cartridge frequency response:** For these systems we used the 1/3-

octave pink noise test bands on B&K *QR 2011*, which is designed for system response checks. The signal measured was from the tape output of the system where possible, or alternatively the headphone output.

Theoretically the test described above should give something approaching a straightline response, but this never happens in practice. For reference, see the charted response of a Koetsu *Black* cartridge (fitted to a Linn *Ittok* arm and *LP12* turntable) when measured this way (the output in this case being from the tape feed of a Musical Fidelity preamplifier). As you can see, the trace shows a slight loss of output at high frequencies.

Note that all cartridge responses were run with the standard 50dB scaling often used in cartridge tests.

## CASSETTE DECK

**Tape used for tests:**

Measurements all refer to Type II (Chrome bias) tape. The brand chosen was either Maxel *XL IIS* or TDK *SA* according to the manufacturer's recommendation (where available). Tapes used were always C90s.

**Frequency response:** The plot was made using the Type II tape selected as described above, and was run at -10dB ref 0VU on the deck's meters. Equipment used was a Neutrik sweep generator and chart recorder. The vertical scale was set to 10dB total, ie 2dB per large division.

**Speed variations (wow and flutter):** Record/replay, DIN Peak weighted. Equipment used:

Kenwood w&f meter audio analyser. The lower, the better.

**Speed drift:** Exactly as for the equivalent measurement of record decks, this is an assessment rather than a measurement of long term drift (low rate speed variations) using the Kenwood w&f meter.

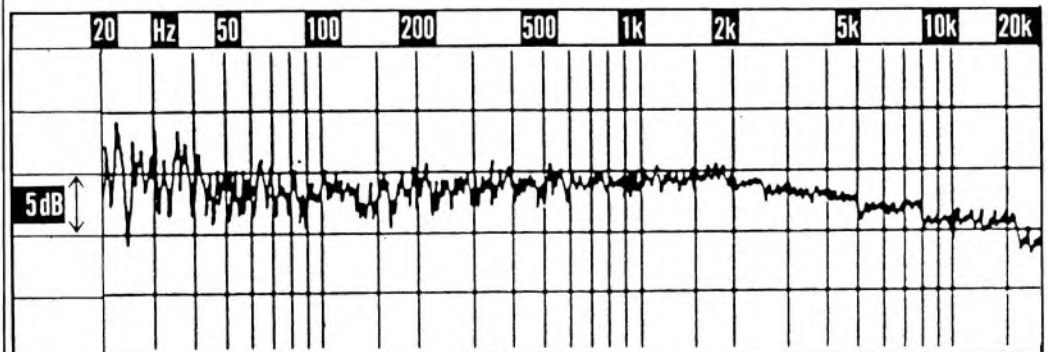
**Signal-to-noise:** CCIR/ARM Weighted signal-to-noise ratio. The figure quoted is for the complete record/playback cycle at 400Hz and is referred to 0VU as indicated by the deck's meters and with any noise reduction switched out. The higher the number the better.

The presence of automatic level record controls, where there is no stable reference point for the record level, frustrated this measurement.

**Distortion:** Measured at 0VU on the deck meters, this should be read in conjunction with the signal-to-noise figure. A poor figure for the latter test may still be satisfactory in the light of a very low distortion figure (say 0.8 per cent), because there will still be several dB of headroom to play with above 0VU. Conversely, an apparently good signal-to-noise result may in reality be no better than average if the distortion level is high (say 2-3 per cent) at 0VU.

## TUNER

**Sensitivity and Signal-to-noise:** These are assessments rather than measurements. A laboratory FM stereo generator, which can be pictured as a small transmitter that can encode any source connected on to FM, was  
**Continued on page 117**



**Frequency response of a reference cartridge, the Koetsu Black in Linn Ittok arm; note expanded (25dB) vertical scale.**

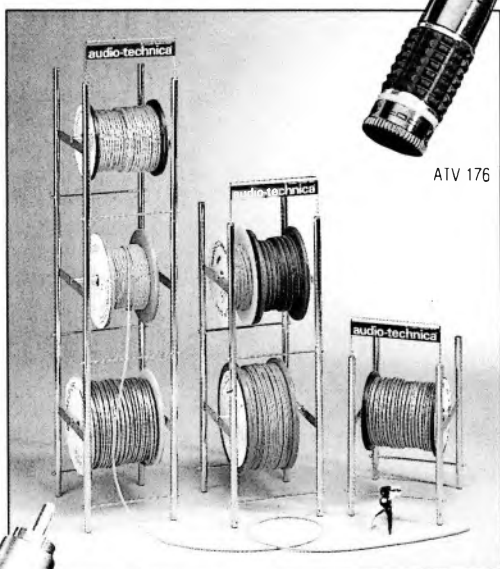
# PCOCC

from 20,000ft to 20,000Hz

Conceived for the Aerospace Industry and perfected by Audio Technica for the audiophile.

New advances in technology often occur in one field, only to be adopted with great effect by another. Such is the case with PC-OCC, originally developed by Dr. A. Ohno to fight 'metal fatigue' in airframe structures.

PC-OCC (Pure Copper-Ohno Continuous Casting) sets out to dramatically reduce the number of crystals in any length of metal. The special 'heat/cool' casting process in fact creates a virtual single crystal in the direction of transmission thus eliminating 'joints' through which signals must



ATV 175

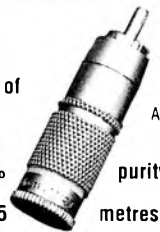
normally pass in conventional cable or wiring.



AT 6110 Audio Cable

The result in audio terms is a more natural, undistorted sound...the dream of all audio enthusiasts.

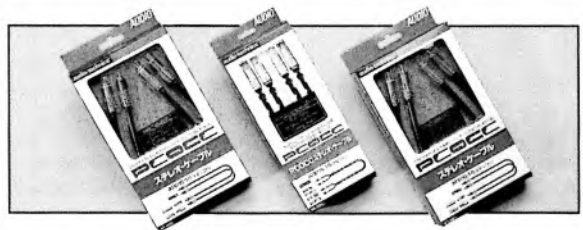
Copper content is as high as 99.9999% (6N), with an average crystal length of 1.25 metres! Additionally, PC-OCC features a very smooth surface to perfectly guard against corrosion.



ATV 173

Dedicated to the ultimate reproduction of sound, Audio Technica have crafted this advance into a unique range of interconnect, speaker cable and colour coded solderless plug options, or 'off the drum' in customised lengths. You'll also find it 'built-in' to a growing number of transducer products right across the A-T range. Audition the PC-OCC difference soon at your specialist A-T Dealer...

ATV 174



...a new level in sonic ability at a price you'll be able to afford.

**the only complete transducer family**  
 CARTRIDGE • HEADPHONE • MICROPHONE • VITAL LINKS



## audio-technica®

□ INNOVATION □ PRECISION □ INTEGRITY

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



PCOCC... the new 'high' in high fidelity

Please send further details on the PC-OCC product range.

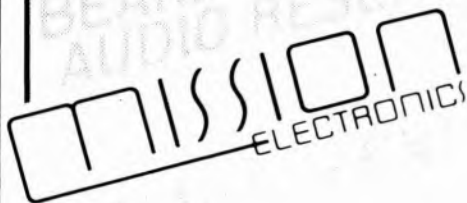
Name .....

Address .....

Post code .....



# 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.  
BADA VISA

continued from page 115

used for these, and for a major part of the listening tests as described in the general introduction. The generator — a Radiometer SMG1 — has a range of outputs ranging from  $10\mu\text{V}$ , an extremely low level barely sufficient for good mono reception even with a sensitive tuner, to 100mV, approximately 100 times the amount necessary for good, low noise stereo. By feeding an unmodulated carrier to the tuner under test (that is, a transmission of silence) it was possible to obtain a reliable and repeatable idea of how sensitive and quiet each tuner was. As part of these tests, the tuner was also driven with a range of signal voltage levels using a very low-level piece of music, which gave an idea of the annoyance value of noise in the presence of a music signal.

## LOUDSPEAKERS

**Frequency response:** One loudspeaker from each pair was measured in the room used for the listening.

The room — the main listening room for the reviews — is irregularly shaped, but is roughly 17 x 15 feet, with a tall ceiling. The in-room response was made with a  $\frac{1}{2}$  octave warble tone signal, which is a normal sine wave modified so as not to excite room resonant modes unduly. The equipment was a Neutrik calibrated microphone and chart recorder, the microphone being essentially flat (ie accurate) to 20kHz.

**Efficiency:** This should be read in conjunction with the amplifier output figure to get a rough idea of the maximum attainable volume levels with each of the systems. Low loudspeaker efficiency implies that more amplifier power will be needed to shake the neighbours up, and vice versa. A combination of low efficiency and low or medium power levels should act as a caution, especially for those with particularly large listening rooms or a penchant for playing music at realistic volume levels.

## LISTENING TESTS

A great deal of thought went into designing listening test procedures which would be repeatable and give consistently useful results. As far as possible, all test conditions were standardised, and system evaluation was based in the first instance on so-called 'substitution' tests. This involved careful listening to a 'reference' system, chosen as being one of good basic sound quality without

being ludicrously expensive compared with the system under test. One at a time the components of the test system were then introduced into the reference system, and notes made on the performance in each case.

After this, the 'reference' system was set aside, and the system under test was assembled and listened to thoroughly as a whole, further detailed notes being made on how each model performed.

In each case, the cassette decks were evaluated for sound quality by listening to pre-recorded cassettes, and by listening to the results of recordings made both from the standard system, and also the one being reviewed — records and compact disc being used for source material. Compact disc was also used to drive a laboratory FM generator which fed a 'broadcast' signal to each tuner in turn, simple A-B switching between the tuner and a straight feed to each system's own amplifier being used to establish sound quality in a particularly repeatable way. Each tuner was also listened to off-air from a four-element roof-mounted aerial which provided a good quality and strong signal from local transmitters.

All listening was done with only the test pair of loudspeakers in the listening room — that is under 'single loudspeaker' conditions. While I made no attempt to keep to a selected batch of records and CDs, I did maintain consistency from system to system by keeping a number the same from one review to the next — but not always the *same* two or three records. There were several reasons for this, though it had a lot to do with wanting to keep a fresh ear and brain for each review.

The complete reference or benchmark system was as follows: Audio Technica AT-95E cartridge, Dual CS-505 and Rotel RP-855 turntables, QED A270 amplifier, Wharfedale 505.2 loudspeakers, Grundig Fine Arts T-9000 tuner, various CD players (mostly Philips and Marantz), plus headphones and sundries, mostly from Sennheiser, QED and Mission.

Apart from the CD player of course, this system is representative of good quality, medium price record playing systems. The loudspeakers, which were used with each system tested, are relatively easy to drive and efficient, as well as fitting the bill on sound quality grounds.



- **Huge selection from the world's leading names**

- **Comprehensive demonstration facilities**

- **Total aftersales care**

- **Best Price Promise**

- **Low cost credit (interest free over £500)**

- **The Paul Roberts Discount card (value £50) is FREE with your Compact Disc player**

- **We guarantee the best deal in the UK on any CD player**

- **Largest selection of CD players and discs in the UK**

**NOW YOU'VE  
READ THE  
REVIEWS  
COME TO US  
FOR THE BEST  
DEAL**

**PAUL ROBERTS**  
*There's nowhere like it for Hi-Fi*

LICENSED CREDIT BROKERS — WRITTEN DETAILS ON REQUEST

OPENING HOURS MON-FRI 9.30am-7.30pm. Sat 9.30am-6.00pm  
31-33 GLOUCESTER ROAD, BRISTOL (0272) 429370. 32 NORTH STREET, TAUNTON (0823) 270000  
203 MILTON ROAD, WESTON-SUPER-MARE (0934) 414423  
65 HIGH STREET, BRIDGWATER (0278) 421234.



# CD MIDI SYSTEMS: CONCLUSIONS, BEST BUYS AND RECOMMENDATIONS

*Alvin Gold rounds up the system tests with summaries of the best of the bunch.*

Looking back over the concluding remarks from the last CD Midi tests (December 1988), I see that very little has changed. Trends are slow to develop, and this in itself is interesting because it suggests that buyers are reasonably happy with what they're being offered. I notice that music centre-like packages (the Proton *AI-3000* on that occasion) were 'flashes in the pan' then. Two such systems are tested here (from Hinari and Grundig), but neither contributes much that is exciting, though the Grundig does throw one new idea into the ring: a series of programmed equaliser responses where once there would have been an equaliser – a clear case of booting out the messenger but retaining the message. There were two other systems without record players (see Yamaha and Sharp) which attempt, with varying levels of success, to make something that looks like a portable sound like a real grown-up system. This is certainly something that other manufacturers will begin to explore as record decks begin to become less important.

For now though, it seems that most people are happier with the traditional, vertical presentation which includes a record deck. And here perhaps we have the most intriguing feature of the market. More than half a decade into the era of the digital silver disc, very few people are yet buying systems that don't play records. Why then does the standard of record replay hardware continue to decline?

There's only one Best Buy this time, and a handful of Recommendations, which are listed in ascending price order:

## BEST BUY

**Technics X1** (£499.90)

A system of separates with abundant wiring around the back, only the cassette deck fails to offer true independence, as it derives its power supply feed from the amplifier. This has potential consequences to note in the event of upgrading. The turntable has a *T4P* cartridge,

whilst the cassette deck offers an uneasy but still potent combination of unidirectional play and auto reverse record transports. The rest of the system is well but conventionally equipped, whilst the speakers stray closer to standard high fidelity practice than most. These competent sounding ingredients combine to form a system with remarkable capabilities given that it costs £500. This is one of the very few currently available midi systems for which excuses needn't be made.

## RECOMMENDED

**Sanyo 49CD** (£299.99)

This is the middle model of three closely related Sanyo systems tested in this issue, and on balance it's the one that offers the most convincing compromise between price and performance. The *49CD* does have some quite severe limitations, not the least of which is an inability to accept any external audio source. It's a strictly no-fuss limited-frills design consisting of a system box with an outboard CD player and a half-way house remote control. Main features include Dolby B, radio presets and a unidirectional twin cassette deck. This is no hi-fi system of course, but it's generally competent and likeable.

**Sony Compact 501CD** (£499.95)

You can buy this good looking system in white if you don't like dark grey. The CD player and turntable are separate, the rest of the electronics are incorporated into a single unit. The tuner has 30 presets with a preset scan feature, whilst the unidirectional cassette deck has Dolby B but you cannot set record levels manually. It is not strictly meant as a serious recorder. The amplifier section lacks the ability to connect to external audio sources, and tuner performance suffers through lack of an industry standard 75ohm aerial interface or a mono switch. What the Sony *does* have is a quite decent standard of audio performance, and in particular a quite decent compact three-way loudspeaker

called the *SS-A701* which is also sold as a component design. This is unusual for any system loudspeaker, and helps make up for the omissions.

**Marantz MX493AVCD & LD20DMS Speakers** (with *LD20* \$549/without \$449)

The Marantz system is recommended when purchased with the (optional) *LD20DMS*, which happens to be a fully fledged and highly rated budget hi-fi loudspeaker in its own right. The *CD583* too is a very highly rated though limited feature CD player that also moonlights in the component hi-fi arena. The other components are not quite in the same league, though the amplifier impresses for its extended audio/visual connectivity. Musically, both the amplifier and dual auto-reverse cassette deck leave quite a lot to be desired, but the system is well priced and its limitations are not too severe.

**Yamaha AST-C10** (\$599.95)

This one is unique. It looks like a ghetto blaster, though it won't run on batteries, and it performs like a good midi system, though there's no record deck. However, it's much more than this short description implies. There is some unique technology in the Astarte system which extends the base capabilities of the small speakers. Styling also breaks new grounds for this class of product, though the control system, is more conventional. However, the most impressive feature is its superb sense of liveliness and resolution.

**Sony Compact 701CD** (£700)

This well engineered system is built from separates, though the tuner and cassette deck are dependent on the amplifier for power. The difference between the *701* and the *711* is that the latter has a graphic equaliser – and it costs more. Consequently it's *not* recommended; that accolade belongs to the *701*. On the debit side, the system has a less intelligent user interface than some, and the twin auto-reverse cassette deck is weak in

the vexed area of wow and flutter. Despite the price, the cassette deck won't record on metal (Type IV), and as on some cheaper Sony systems the tuner lacks a mono switch. When used in anger however, the system is perhaps best characterised as having an unobtrusively fine standard of music making.

**Technics X5D** (\$799.90)

The *X5D* is distinguished by sharp styling, and a high level of native intelligence (OK, clever controls) with auto-source select and powerful aids to help when illegally dumping those CDs on to tape. The tuner has a timer section which can be used to make unattended recordings off-air. The cassette deck that the timer and CD do so much to support has two optically triggered auto-reverse mechanisms, Dolby C and a number of tape search aids, making this system one of the most sophisticated available for the tape enthusiast. It's also a system for the music enthusiast that can outperform some separates systems at this price.

**Pioneer System 330D** (£1,079.80)

Here we have the most costly recommendation in this project. Against a backdrop of improving loudspeaker standards with a wide cross section of systems, the Pioneer's boom boxes are not very impressive, and a recommendation for the system is given subject to the supplied loudspeakers being junked in favour of something better.

Flexibility takes precedence over simplicity of operation, and nowhere is this more obvious than in the case of the (optional) CD player which has a multiplay capability based on a six-disc magazine. The turntable is engineered to higher than normal standards (which admittedly is not saying a lot), and the cassette deck has Dolby HX Pro headroom extension as well as Dolby C noise reduction. The audio engineering is of a surprisingly exacting standard, reflected in a genuinely fine standard of music making.



**...Lend me  
your ears...  
and you'll hear music like  
you've never heard it before.**

We are probably the only specialist Hi-Fi Dealers who **record** as well as listen to live music. With this expertise we can recommend equipment from the following manufacturers:-

**AUDIO INNOVATIONS**, Audionote, Audion, Ariston, BLO, Beyer, Decca, Denon, Foundations, Goldring, Helius, Jecklin-Float, JPW, JBL, Marantz, Nagaoka, Nakamichi, Ortofon, Pink Triangle, Pirates, QED, Revox, Rotel, The Rock, Sennheiser, **SNELL**, Sony, Sugden, Suma, Supra, Systemdek, Toriye Platforms, Target, Valdi, **VOYD**.

**Audio South**

"Professional record cleaning now available"

Ex Dem CD players and S/H equipment available - ring for details.

**5 Mead Lane, Farnham, Surrey GU9 7DY**

**Tel: (0252) 714555**

Open Monday to Saturday 10-6 pm  
Demonstrations by Appointment

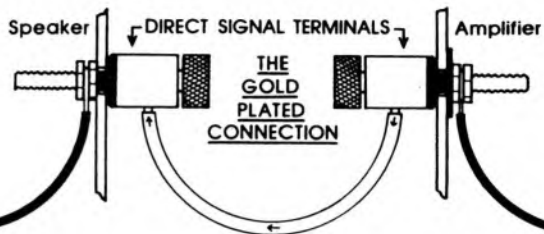


## THE MICHELL CONNECTION

"The ultimate connectors for all quality speaker cables"



BANANA PLUG



SPEAKER CLIP ADAPTOR

You ain't heard nothin' yet, folks! GET THE CONNECTION!

For details please write:

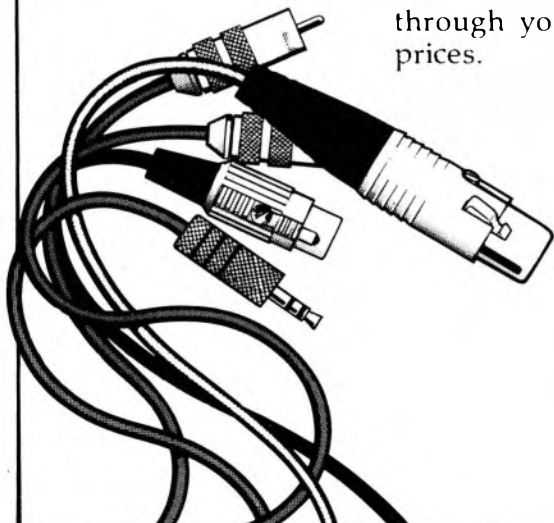
**J A Michell Engineering Ltd**

Dept NHS, 2 Theobald Street, Borehamwood, Hertfordshire, England  
Telephone 01-953 0771

## QUALITY HAND BUILT INTERCONNECTS

Endorsed By Hi-Fi Specialists Throughout the World

Terminated with gold or nickel plugs suitable for all systems, prices for our leads start at £15. Components are also available through your Hi-Fi dealer at competitive prices.



13 amp gold plated plugs ... £5.99

4mm Banana Plugs, gold plated  
Basic gold supplied with  
heat shrink, set of 4 ..... £3.50

Large cable Entry Banana Plugs  
to suit bi-wiring  
Set of 4, gold plated ..... £7.00



**19 ST. MARKS ROAD, SALISBURY, SP1 3AY Tel: 0722 331674**

Telephone for full listings of Chord Company stockists



# HI-FI Valves

Over 3 million valves available from stock. Please phone for a competitive quote.

We offer: specially selected pre amp valves; a wide range of matched power valves; high quality CV and ruggedised valves;

## PHILIPS/MULLARD

E80CC	25.00
E81CC	4.50
E82CC	4.50
E83CC	4.50
E88CC	5.50
E182CC	7.50
ECC81	2.50
ECC82	1.95
ECC83	1.95
EL34	9.50
EL84	4.50
CV4024	4.50
CV4003	4.50
CV4004	4.50

## \* Low-microphony specially selected valves

ECC81	2.50
ECC82	1.85
ECC83 Super	3.50
ECC88 Super	3.35
EL34	4.50
EL84	1.95
EL86	2.75
GZ34	4.50
6L6GC	4.50
6550A	9.95
7025	3.50
KT88	16.00
PL519	5.95

## GEN. ELECTRIC/RCA

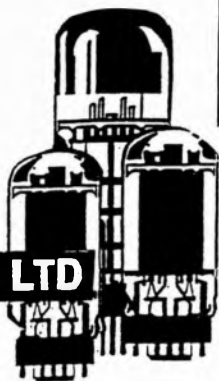
5U4GB	4.50
6CA7	10.00
6L6GC	9.50
5751	2.95
5814A	3.25
5881	9.95
6080	8.50
6550A	13.95
7027A	10.00
7189A	7.50
7868	8.50
8417	9.95
KT66	11.95

## TEONEX TESTED

12AT7/ECC81	1.50
12AU7/ECC82	0.85
12AX7/ECC83	0.95
6DJ8/ECC88	1.35
EF86	2.50
6CA7/EL34	3.25
6BQ5/EL84	0.95
KT66	5.00

## SIEMENS

6189	3.50
6201	6.45
E80CC	25.00
E81CC	5.50
E280F	19.50
E288CC	17.50
ECC81	2.50
ECC82	2.50
ECC83	2.50
ECC801s	6.95
ECC802s	6.95
ECC803s	6.95
EL34	4.50



# P. M. COMPONENTS LTD

How to buy: You may phone our sales desk 0474 560521 (24 hour answering service) and order by credit card or send your order with cheque/postal order and we will despatch all ex stock items the same day.

UK orders p&p £1.00 per order. Please add 15% VAT to prices shown. Export orders welcome, carriage at cost.

# definitive audio

WE HAVE EXPANDED INTO IMPROVED PREMISES IN BRIGHTON AND OPENED A NEW BRANCH IN NOTTINGHAM.

OUR POLICY IS TO SELL ONLY ONE PRODUCT AT ANY PRICE POINT; THE PRODUCT WE BELIEVE IS THE BEST!

WE INVITE YOU TO COMPARE ANY OTHER EQUIPMENT TO OURS IN ONE OF OUR WELL EQUIPPED DEMONSTRATION ROOMS ... AND HEAR THE DIFFERENCE!

- VOYD
- SYSTEMDEK  
Turntables
- HELIUS
- GOLDRING
- AUDIO NOTE  
Arms & Cartridges
- AUDIO INNOVATIONS  
Amplifiers
- J.P.W.
- SNELL
- HORNING  
Speakers
- PIRATES
- TARGET  
Loudspeaker Stands
- MARANTZ
- DENON
- ROTEL  
C.D. Tuners and Cassettes

NOTTINGHAM (0602) 813562  
 BRIGHTON (0273) 208649

Unit 8 Dyke Road Mews ·  
 74-76 Dyke Road · Brighton ·

AFTER VANQUISHING THE EVIL 'RACK ROBOTS', SUPERGIRL FLIES TO HER FORTRESS IN THE SOUTH OF ENGLAND... ONE MORNING, THE PHONE RINGS...



THE CONTINUING ADVENTURES OF

# S.U.P.E.R.-G.I.R.L

GUARDIAN OF MUSIC

- ALSO STARRING · Acoustic Energy · Arcam · Ariston · Audio Innovations  
 B&W · Cambridge Audio · Castle · Celef · Creek · Cyrus · Denon · Dual  
 Epos · Exposure · Gale · Heybrook · JBL · KEF · Linn · Marantz · Audiophile  
 Michell · Mission · Monitor Audio · Musical Fidelity · Naim · Nakamichi  
 Oracle · Pro Ac · QED · Quad · Rega · Rolsan · Rotel · Ruark · Sony ES  
 Tannoy · Wharfedale · Yamaha

Winners of the FBA Dealer of the Year Award for 1988 and 1989 and the Sony Hi-Fi Dealer Award for 1986.

# The Audio File

27 HOCKERILL STREET  
 BISHOP'S STORTFORD  
 HERTS. CM23 2DW  
 (0279) 508576

# music made live...

## Bartletts money saving recommended systems

Turntable	Amps	Speakers								
Dual		Wharfedale Delta 30	JPW Sonata AR Red Box	Celestion 3	Mission 761 Heybrook Point 5 Tannoy E11 AR 122	Celestion DL 411	AR 122 B & W DM550 Gale GS210 Celestion DL6 11 Allison AL105	Tannoy M15 Mission 762 Infinity RS2001	Heybrook HB1 Celestion DL 811 AR 132 Allison AL110	Tannoy M20
CS430	AR A03	279.95	297.95	306.95	314.95	331.95	339.95	356.95	382.95	407.95
CS430	AR A05	314.95	332.95	341.95	348.95	365.95	373.95	390.95	416.95	441.95
CS430	ARCAM Alpha II	297.95	314.95	323.95	331.95	348.95	357.95	373.95	399.95	424.95
CS430	Denon PMA 250	249.95	267.95	276.95	284.95	301.95	314.95	335.95	352.95	377.95
CS430	Marantz PM 35	271.95	289.95	298.95	305.95	322.95	331.95	357.95	373.95	398.95
CS430	Marantz PM 45	314.95	332.95	341.95	348.95	365.95	373.95	390.95	416.95	441.95
CS430	NAD 3020E	254.95	272.95	281.95	289.95	307.95	314.95	335.95	352.95	377.95
CS430	NAD 3130	288.95	306.95	315.95	322.95	339.95	348.95	364.95	389.95	414.95
CS430	NAD 3240PE	365.95	383.95	392.95	399.95	416.95	424.95	441.95	467.95	492.95
CS430	NAD 3225PE	271.95	289.95	298.95	305.95	322.95	331.95	357.95	373.95	398.95
CS430	Rotel RA810A	238.95	246.95	255.95	272.95	289.95	297.95	314.95	340.95	365.95
CS430	Rotel RA820AX	272.95	290.95	299.95	306.95	323.95	332.95	348.95	374.95	398.95
CS430	Rotel RA820BX4	306.95	324.95	333.95	340.95	357.95	366.95	373.95	399.95	467.95
CS430	Rotel RA840BX4	348.95	366.95	375.95	382.95	403.95	408.95	424.95	448.95	510.95
CS430	Rotel RA870BX	434.95	452.95	461.95	479.95	496.95	504.95	521.95	547.95	592.95
CS430	Yamaha AX330E	254.95	272.95	281.95	289.95	307.95	314.95	335.95	352.95	377.95

### Free cartridge, cable, 3-year guarantee, carriage\*

All systems supplied with cartridge, speaker cable and 3-Year Parts and Labour Guarantee. Carriage is FREE For UK Mainland\*.

### Price guarantee

If you can buy cheaper—including leads, cartridge, carriage and 3-Year Guarantee—we will match it.

Prices correct for the life of this magazine, but are subject to change.

Stockists of A & R, AR, Audiolab, B & W, Denon, Dual, Exposure, Gale, Heybrook, KEF, Linn, Marantz, Musical Fidelity, Mission, NAD, Nakamichi, Quad, Revolver, Rotel, Tannoy, Wharfedale, Yamaha.

### Improved turntables (inc. cart)

AR EB 101 extra £93.00 Dual CS 503-1 extra £21.00

Dual CS 505-3 extra £42.00 Revolver Rebel extra £67.00

Revolver extra £116.00 Rotel RP855 extra £77.00

### CD instead of turntable front end

AR CD06 extra £179.00 Denon DCD 520 extra £68.00

Denon DCD 620 extra £93.00 Denon DCD 820 extra £136.00

Denon DCD 920 extra £179.00 Denon DCD 1420 extra £264.00

Denon DCD 1520 extra £390.00

Marantz CD 40 extra £93.00 Marantz CD 50 extra £136.00

Marantz CD 50 SE extra £179.00 Marantz CD 60 extra £179.00

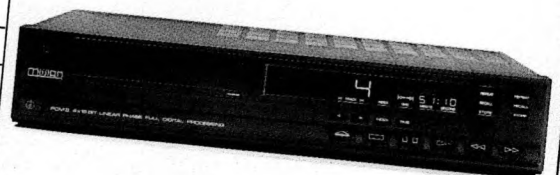
Marantz CD 60 SE extra £221.00 Marantz CD 80 extra £349.00

NAD 5320 extra £85.00 NAD 5325 extra £110.00

Rotel RCD 855 extra £136.00 Yamaha CD 29 extra £68.00

Yamaha CDX 630 E extra £93.00 Yamaha CDX 710 extra £119.00

Yamaha CDX 810 extra £179.00



**BARTLETTS** 175 HOLLOWAY ROAD, LONDON N7. TEL: 01-607 2296

Access. Visa cards accepted Demonstration by appointment. Please phone.

E & O E



# CHOOSING AND USING . . . VALVE AMPLIFIERS

*John Bamford has been listening to a group of valve amplifiers, while Paul Miller provided technical measurements. Here they explain the tests and outline some problems associated with valve amp ownership.*

It's widely assumed you've got to be some kind of hi-fi nutcase to want to use a valve amplifier. Clicks and thumps and high hum levels are all problems one often associates with valve amplifiers, along with the hassle of needing plenty of space (valves get hot, so they need a free flow of air around them) and a lot of disposable cash.

The latter certainly hasn't changed much, valve amps today remain almost exclusively the province of the well-heeled enthusiast, although the British-based company Audio Innovations has done much to reduce the cost of valve amp ownership by introducing some integrated models in recent times.

It's usually preamplifiers which are to blame for high noise levels in valve set-ups. However, none of the components tested this month, or those in our October '88 issue, gave any real cause for concern in respect to untoward background noise – although correct matching of separate components is a particularly important issue.

With valve designs the output impedance of the preamplifier is an important parameter, not only in terms of straightforward voltage transfer to a load, but also with respect to the parallel capacitance of the interconnect cable that is used between pre and power amp. In the cases where a high output impedance is quoted (anything over a few thousand ohms) do try to avoid long interconnects.

Power amps with an input impedance around 10 or 20k $\Omega$  will not pose a problem when matching up with any solid state preamp, but certain valve preamps may suffer a loss of bass extension simply through the current limitations of their output valve(s). Of course, this will depend very much on the topology chosen, but very low current double-triodes such as the ECC83 may cause problems if used in a lightly cap-coupled output configuration.

This sort of problem is cured with high input impedances (up to 0.5M $\Omega$  has been recorded), though if used with a high and

variable source impedance, such as that presented by a 'passive preamp' (in other words a simple volume control in a box for use with CD players and other line level inputs), it is possible that electromagnetic (hum) coupling will degrade the noise performance. It is also possible that the high frequency response may be curtailed.

Power amps with a very high sensitivity (that is, requiring just a few tens of mV for full output) will also be more susceptible to hum fields, especially if they also feature a high input impedance. The choice of preamp is critical here, as is the type and method of screening of the interconnect.

It is important to appreciate these problems – many of which are peculiar to the very specialised world of valve amps – even though a good dealer should ensure you do not make a mistake by choosing incompatible components.

## LAB TESTS

All input sensitivity (0dBV and 0dBW) and overload measurements were assessed according to IHF specification, dB headroom figures quoted for the latter being relative to 0.5mV for MC and 5mV for MM. Channel balance was taken at this sensitivity though stereo separation was assessed at +10dB. Power output was

measured to a ceiling of 1 per cent THD, including the IHF dynamic headroom test.

A 3D ultrasonic distortion graph accompanies each review. Extensively averaged, this plot examines the performance of an amplifier while subject to a composite swept input of 0-20kHz (0dB reference), a constant 20kHz signal (-24dB) and a reversed sweep running from 0-50kHz and back again (-24dB). The input to the power amplifiers was adjusted so as to raise two-thirds output into 4ohms relative to 1kHz. For the preamps a pre-equalised composite sweep was introduced to the MM disc stage, the level referred to 5mV rms at 1kHz which is equivalent to a composite peak of 77.8mV at 20kHz.

## Broad-Band Radio Frequency Intermodulation Test:

In general terms this test reveals just how sensitive an amplifier is to spurious Radio Frequency noise, whether introduced directly or indirectly.

A precision RF signal generator produces an RF carrier signal at 20mV<sub>rms</sub>, modulated to 100 per cent using an external pseudo-random noise source. The resulting non-correlated AM/RF signal is then ramped between 1-50MHz or 1-200MHz by controlling the generator through an IEEE interface BUS,

using a dedicated program developed in this laboratory. The generator and noise source are also synchronised with an FFT spectrum analyser through this same interface.

Once connected to the amplifier (via the line or CD-direct input) any subsequent demodulation/intermodulation between the sweeping carrier and its pseudo-random sidebands results in non-correlated noise appearing at audio frequencies at the output of the amplifier.

This represents a change in the noise floor of the amplifier over a discrete portion of its frequency range.

By comparing the steady-state noise floor of the amplifier with its noise floor under the influence of RF IMD, a measure of the difference and therefore the actual effect of RF IMD can be deduced. It is this change or difference in the noise floor that is depicted on the 3D plots.

The depth of z-axis is either calibrated in steps of 5MHz (for the 1-50MHz sweep) or 20MHz (for the 1-200MHz sweep) and denotes the changing frequency of the RF carrier. By contrast the x-axis is restricted solely to the audio band (in this case 50Hz-20kHz) and is calibrated across a log, rather than linear, scale. The vertical or y-axis gives an indication of relative amplitude and is scaled in steps of 2dB over a maximum range of +16dB.

Clearly, any demodulated RF noise that causes a change in the noise floor greater than 16dB will create a plateau effect on the plot.

## LISTENING TESTS

Many weeks have been spent auditioning this selection of valve amplifiers in various combinations. Turntables used were the Townshend *Rock* and *Rock Reference*, with *Excalibur* arms, and a selection of cartridges ranging from the Goldring *Eroicas* (high and low output), Audio Technica *OC9* and *ART 1*, and Koetsu *Red*.

CD inputs were tested using a Marantz *CD94* with Musical Fidelity *Digilog* outboard D-to-A converter, and speakers used were Snell *Type C* and *Type E*.



*Another batch of valve amplification components makes it to JB's listening room – brands as diverse as Ray Lumley, Audio Innovations, Lectron, Oakley, Concordant, Rose and Audion. Some reviews are published in this issue, the rest will follow next month.*

## WHATEVER YOUR NEEDS...

The Listening Rooms, London's new specialist hi-fi shop, has the answers.

With over thirty years in hi-fi retailing, the two directors, John Oliver and Paul Tam, have experience in all aspects of multi media systems. From budget equipment to top end audio.

But why the name?

Our South Kensington premises include two rooms specifically for you to audition hi-fi, in a comfortable and relaxed atmosphere. In addition, we offer a full installation service, and all equipment comes with a two year parts and labour guarantee.

For those without the time or technical expertise, The Listening Rooms specialises in multi-room, remote control systems. We can both plan and install systems to your individual needs, and the highest professional standards.



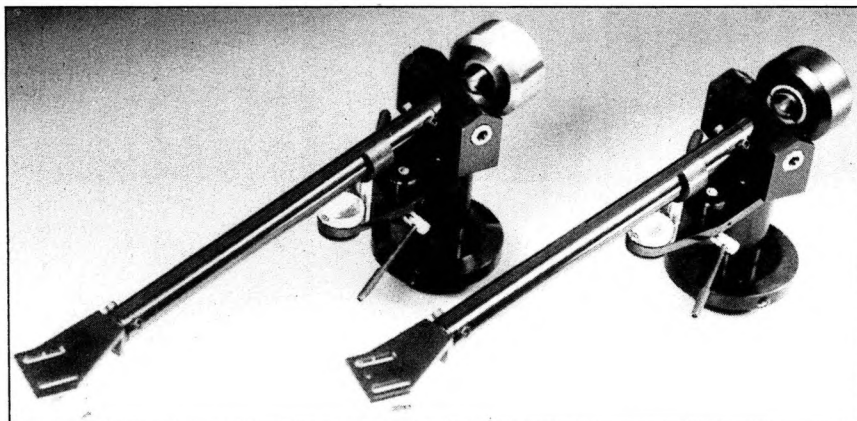
THE listening  
rooms

LINN · EPOS · QUAD  
ARCAM · MERIDIAN  
MUSICAL FIDELITY  
MISSION · TANNOY  
MARTIN LOGAN · SME  
AUDIO RESEARCH  
MARANTZ · YAMAHA  
DENON · NAKAMICHI  
ACOUSTIC ENERGY  
SONUS FABER · DUAL  
REVOX · GOLDMUND  
CREEK · KISEKI · VDH  
ROGERS · KOETSU  
MAGNEPAN · TOPTAPE

THE LISTENING ROOMS LTD.,  
161 OLD BROMPTON RD, LONDON, SW5 0LJ.  
TEL: 01-244 7750/59. FAX: 01-370 0192.  
VISA · ACCESS · AMERICAN EXPRESS  
Monday-Saturday - 10am-6pm

## SOUND DEALS

52-54B SHORTMEAD STREET, BIGGLESWADE BEDS SG18 0AP · Tel: (0767) 312249 · Fax: 315714



### ALL MANTICORE PRODUCTS ON PERMANENT DEMONSTRATION

*"Manticore can be proud of this tonearm. It is well conceived, very well built and extremely well finished arguably setting standards at this price point"*

Hi-Fi Answers - September 1989

BECAUSE OF OUR CLOSE PROXIMITY TO MANTICORE WE ARE ABLE TO OFFER ANY WALNUT, BLACK OR MAHOGANY TURNTABLE/ARM COMBINATION, FAST MAIL ORDER SERVICE ON ANY MANTICORE PRODUCT

**STOP PRESS:** The amazing new MANTICORE MAGICIAN Tonearm now on Demonstration. Glued armtube, Swiss Abec 7 bearings, VdH wiring, superb silver finish. Let the MAGICIAN weave its magic spell on your turntable, £350.00, and in our opinion worth double!

Part-exchange welcomed ★ wide range of previously owned equipment ★ Two single speaker demonstration rooms ★ Delivery & installation ★ Rega arms VdH rewired ★ Rotel RC850 and RC870 Preamps upgraded ★ Complete LP collections purchased ★ Custom built Aerolam and MDF support platforms ★ Specialists in Professional Audio/Visual systems ★ All usual dealer facilities.

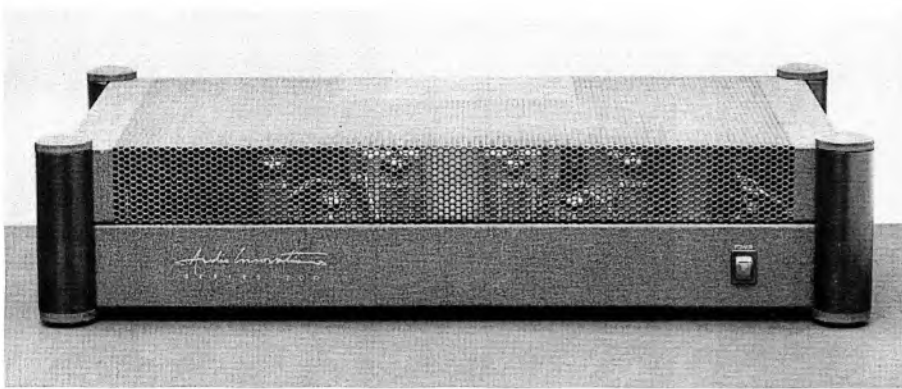
SAE OR TELEPHONE FOR LATEST NEWSLETTER WITH DETAILS OF ALL THE ABOVE & SECONDHAND LIST



# AUDIO INNOVATIONS SERIES 200

AUDIO BY DESIGN LTD., UNIT 8, DYKE ROAD MEWS, 74-76 DYKE ROAD, BRIGHTON BN1 3JD. TEL: (0273) 203277.

RECOMMENDED



Regular *Choice* readers will remember that in the last batch of valve amplifiers we tested the Audio Innovations models caused quite a stir, in more ways than one. To cut a long story short, on the test bench they measured like the proverbial 'dog's dinner' but sounded splendid when playing music through loudspeakers.

Along with the *Series 400* integrated valve amplifier (see separate review), the *Series 200* is one of a new generation of products from this Brighton-based company built into handsome new cases. The casework isn't especially luxurious, hence the real world prices for these amplifiers, but is extremely clever in design. A huge investment in factory tooling, combined with good production engineering, has enabled the company to produce amplifier cases which are both well finished and distinctively elegant in appearance.

There's not much one can say about this simple stereo power amplifier in terms of 'facilities'. A rocker switch on the front panel fires it up, left and right channel inputs at the rear are via phono sockets (no gold-plated luxuries here!), and a pair of decent quality combined 4mm socket/binding post terminals are provided for the output to one pair of loudspeakers. But there's plenty one can say about the design philosophy of the amplifier. The *Series 200* replaces the company's *Edison 12/Aria 12* power amplifiers, from which the *Hi-Fi Answers* magazine *A12* kit amplifier was also derived, with a completely revised circuit which now uses no negative or local feedback whatsoever. And like all Audio Innovations amplifiers, the *200* has been designed for minimal non-harmonic and time base anomalies, rather than vanishingly small harmonic or intermodulation distortions which the company feels are less important when it comes to the tricky business of creating a believable image of a real musical event through a hi-fi system.

## LAB REPORT

Apparently rated at 12W Class A, when assessed in the normal *Choice* manner on the laboratory test bench the *Series 200* power amplifier actually offered a continuous 670 milliwatts with enough dynamic headroom to accommodate 1W under transient (music) conditions. Higher power levels are available with mounting THD, which is likely to be in

double figures before the amp is able to sustain over 10W. The 20Hz power figures were assessed at 3 per cent THD while, at higher frequencies, its squarewave performance was compromised by a 15 per cent overshoot (non-inductive 8ohm load at 10kHz).

A single PCC88 double-triode constitutes both phase-splitter and driver element at the input to the amp while a pair of EL84 pentodes are used in push-pull mode at the output. No compensation network is utilised as the output is both exceedingly non-linear and high in impedance. So, not only is the nominal damping factor less than unity but distortion deteriorates to between four and six per cent at the frequency extremes.

The ultrasonic distortion plot reveals these non-linearities as 2nd-4th order mechanisms, interactions between  $F_{0-20k}$  and both  $F_{20k}$  and  $F_{0-50k-0}$  being clearly represented. With no feedback in operation the amplifier is essentially open-loop and so is grossly non-linear both at AF and RF. Its sensitivity to AM/RF noise in the 1-120MHz region is clear enough, however the subjective consequences of this double intermodulation may well be masked by the conventional audio frequency distortions.

## SOUND QUALITY

Audio Innovations' sales literature makes for interesting reading (see *Series 400* review for more on this), and when listening to the sound produced by the company's amplifiers one is forced to conclude that there must be something in its claims. For a start, despite the ludicrous steady-state power output figures we've measured, the *200* sounds extremely dynamic and 'open-mouthed', and even in my spacious listening room (approx 27 x 14ft) I was able to create perfectly adequate sound pressure levels using Snell *Type E* and *Type C* loudspeakers. Indeed, bi-amping *Type Es* with two *Series 200s* is something I strongly recommend you investigate if you're looking for high-end audio performance at a down to earth price (\$2,500, say, for a complete record-playing system - plus the cost of additional sources to taste).

If my audio memory serves me correctly, this amplifier sounds a little 'tidier' than its *Aria 12* predecessor, with a less vague treble quality and better defined (though slightly less extended) bass. Transparency through the midband is first class, the amplifier pro-

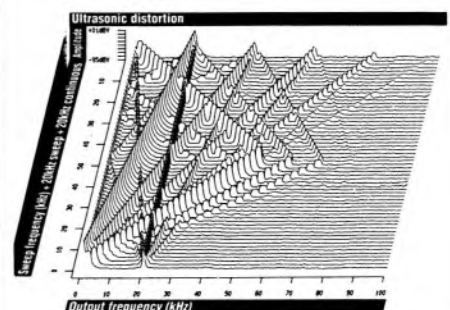
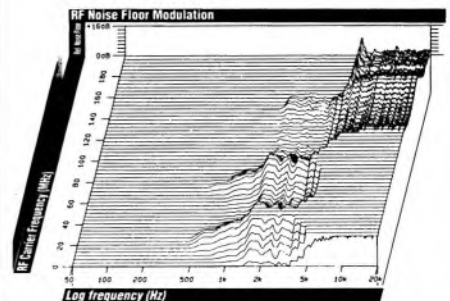
ving capable of excellent detail resolution.

## CONCLUSIONS

At £375 the *Series 200* is a bit too costly to ever be described as a Best Buy. After all, if you want good sound on the cheap a little solid state integrated amp like the Arcam *Alpha* or Cyrus *One* can make enjoyable music for well under £200. But for those listeners looking for something a little bit special - and those who are prepared to put up with the inevitable inconveniences which come as part and parcel of owning valve equipment - this power amplifier is highly Recommended. The *200* will not drive power hungry loudspeakers, but any model in the 89-90dB sensitivity range is a pretty safe bet for creating sound pressure levels high enough to drive next door neighbours up the wall.

## TEST RESULTS

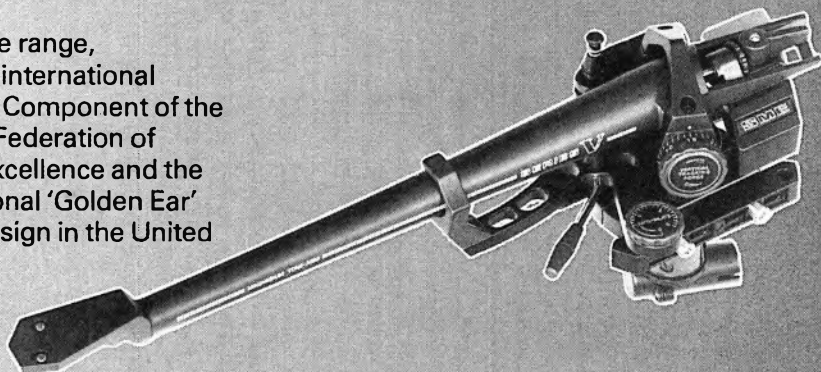
Maximum Continuous Power Output, 8ohms	20Hz 123mW*	1kHz 673mW	20kHz 417mW
4ohms	662mW*	394mW	175mW
Dynamic Headroom (IHF)			+2.0dB (1.07W)
Output Impedance	12.5ohm	38.0ohm	20.2ohm
Damping Factor	0.355	0.210	0.397
Stereo separation (DdBW)	66.3dB	75.3dB	70.7dB
Total Harmonic Dist (DdBW)	-24.3dB	-38.1dB	-36.2dB
(½ power)	-27.5dB	-44.1dB	-42.3dB
CCIR Intermodulation Distortion (DdBW)			-40.0dB
CCIR IM Dist. (½ power)			-44.3dB
Rise Time (at 10kHz)			5µsecs
Power bandwidth (<1% THD)			See Text
Squarewave linearity			-64.7dB
Phase Shift (20Hz)			14°30'
(1kHz)			0°0'
(20kHz)			342°0'
Noise (A wtd, 20Hz-20kHz) DdBW			-85.4dB
(A wtd, 20Hz-20kHz) ½ power			-80.4dB
Residual noise (unwtd)			-62.7dBV
Input Sensitivity (for DdBW)			77.4mV (1.4% THD)
(for full output)			58.8mV
Input loading			165kohm
Retail Price			£375



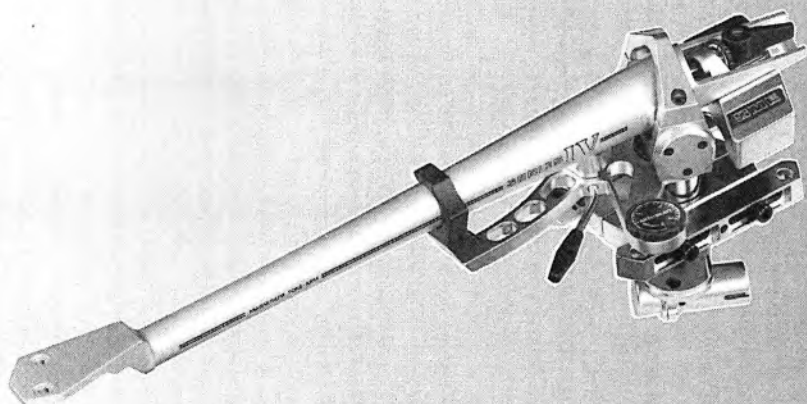
# THOROUGHBREDS

Since 1962 we have received eighteen prestigious awards for our precision pick-up arms. One of the models shown here could well transform the performance of your deck and cartridge, realising, probably for the first time, the full potential of your L.P. records. Glance through one of our instruction books, sometimes 24 pages with more than 40 illustrations, to appreciate the attention to detail. Only SME arms provide the precise adjustments essential for true cartridge performance and the build quality to minimise sound colouration. Insist on SME, the thoroughbred arm, to update your present equipment.

**SERIES V** flagship of the range, acknowledged by leading international authorities with the Audio Component of the Year Award in Japan, the Federation of British Audio Award for Excellence and the Absolute Sound International 'Golden Ear' Award for Pick-up Arm Design in the United States.



**SERIES IV** owes much to Series V technology. Although at a lower price, it retains the unique one-piece magnesium tone arm, dual lock base and other advanced features. Selected for the Federation of British Audio Source Component of the Year Award, 1988.



**SERIES 300** embraces three models: the 309, 310 and 312. The influence of the classic V will be clearly seen but here the aim has been to meet the needs of a broader market in which price, alternative arm lengths and an interchangeable shell facility are important considerations. The Series 300 offers performance and manufacturing excellence unmatched by many more expensive arms.



**SME**  
The best pick-up arm in the world

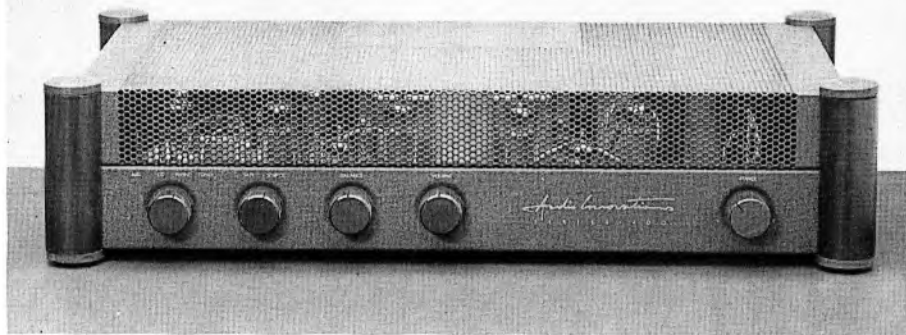
Write or phone for advice and descriptive leaflets. Our sales and service departments would be happy to hear from you:

SME Limited, Steyning, Sussex, BN44 3GY, England.  
■ (0903) 814321 ■ FAX (0903) 814269

# AUDIO INNOVATIONS SERIES 400

AUDIO BY DESIGN LTD., UNIT 8, DYKE ROAD MEWS, 74-76 DYKE ROAD, BRIGHTON BN1 3JD. TEL: (0273) 203277.

RECOMMENDED



Built into the same distinctively styled case as the *Series 200* power amplifier, Audio Innovations' *Series 400* integrated model is a Class A design which, again like the *200*, uses no feedback whatsoever. There are inputs for phono (MM) plus four line inputs with a proper tape monitor loop, a Noble plastic film potentiometer is used for the volume control, and a balance control is also provided. In truth, the *400* is a power amplifier with in-built RIAA phono preamplifier, as all line level signals are taken directly through the volume control to the power amplifier stages.

In the design of its latest series of amplifiers which use no feedback, Audio Innovations states quite clearly that it feels the hi-fi industry is misguided in searching for ways to make amplifiers which have less measured distortion, high damping factors, and so on. What the company is saying – and this is explained fully in the amplifiers' accompanying literature – is that our ears are much more sensitive to time-based distortions than to things like frequency response, intermodulation and all the other kinds of distortions which we can measure accurately on a test bench, and that the distortion of *amplitude versus time* is one of the major reasons that 'conventional' hi-fi sounds like, well, hi-fi – and not real music.

Most hi-fi manufacturers have plenty of 'sales spiel' which sets out to persuade you and I that its products are superior to other manufacturers' products. Thing is, I'm forced to take some notice of what Audio Innovations is saying because of the way its valve amplifiers reproduce the sound and dynamics of real musicians playing real instruments. We've measured other models from the Audio Innovations stable before, and on paper they look like they can't possibly be of 'hi-fi' quality. This new *Series 400* integrated model is no different . . .

## LAB REPORT

Based around the same EL84 power stage as the *Series 200* power amp, the *Series 400* integrated is also equipped with a wholly passive disc eq network (10Hz-40kHz to -3dB). ECC82 triodes are used here, the cathode-follower topology reducing the output impedance of the driver stage. However, because of the large excess gain demanded by the passive eq network this limits the remaining

headroom to just +19.5dB at 1kHz.

Nevertheless the disc stage does not enter a hard clip immediately beyond the 1 per cent point, it simply becomes progressively less linear. Similarly, the headroom available on the line input measured just 600mV.

The 1-2 per cent THD and 8-9 per cent IMD are resolved on the 3D plot which shows 2nd and 3rd-order products dominating the spectrum. IMD routes such as  $F_{0-50k-0} - F_{0-20k}$  and  $F_{20k} - F_{0-20k}$  can be seen increasing with level with decreasing frequency, as a function of the RIAA characteristic. This shows that non-linearities originate with the disc input and not the subsequent EL84 power stage.

Talking of which, the power output was still ludicrously low at just 1W midband and just over a thousandth of a watt at 20Hz (at 3 per cent THD)! Up to 5-5W could be squeezed out at 5 per cent THD. Channel balance was out by 3-5dB at -60dBV while separation hovered around 44dB midband before falling to 23dB at 20kHz due to capacitive coupling between channels.

## SOUND QUALITY

Less overtly 'wide open' and full-bodied than Audio Innovations' other integrated models, this new amplifier nonetheless is quite a bit better at resolving the fine musical and soundstaging details in recordings. Balance is a tad 'thin' at times, with a rolled-off bass end and what sounds like a bright treble, so it's important to understand that the *400* is fine for small systems but will be less successful if asked to drive large loudspeakers (which it will, for as long as they're an easy load). Also, because of the lean and up-tilted subjective balance, the amplifier does CD sources no favours whatsoever. Suck it and see is the best I can say; choice of speakers and cables will doubtless prove critical in assembling a balanced system.

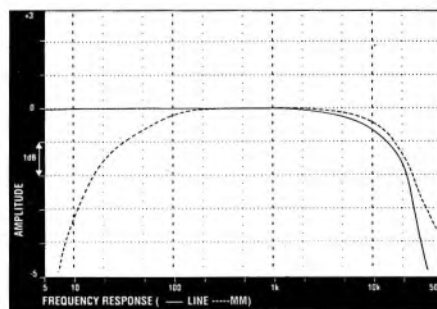
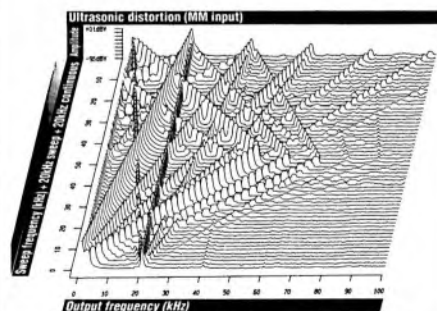
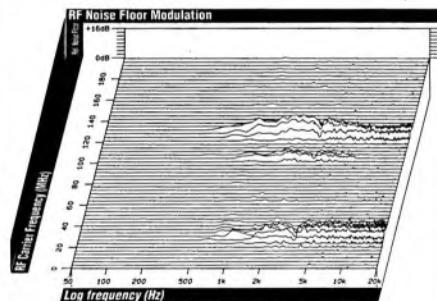
## CONCLUSIONS

Many hi-fi buyers will consider £575 far too much to pay for any hi-fi amplifier, so a *Choice Best Buy* isn't really appropriate here. But when the amplifier is used within its performance envelope – in a properly matched (analogue?) system with sensitive loudspeakers, in other words – it produces a sound which I'm sure many audio enthusiasts would give their eye teeth to enjoy at

home. Highly recommended, then – and make no mistake about it: in the heady world of valve amplifiers the *Series 400* is very much a 'best buy'.

## TEST RESULTS

Maximum Continuous Power Output, 8ohms 4ohms	20Hz 1.3mW 21.5mW	1kHz 1000mW 450mW	20kHz 690mW 229mW
Dynamic Headroom (HF)			+1.42dB (1.39W)
Output Impedance	12.2ohm	44.9ohm	21.3ohm
Damping Factor	0.656	0.178	0.376
		CD/Aux	MM
Stereo separation (20Hz)		64.5dB	55.3dB
(1kHz)		41.9dB	44.6dB
(20kHz)		22.5dB	23.8dB
Channel Balance (1kHz, -20dBV)		0.53dB	0.88dB
(-60dBV)		3.61dB	5.21dB
Total Harmonic Dist (0dBW) (½ power)		-42.2dB	-34.9dB
		-49.8dB	-36.8dB
CCIR Intermodulation Distortion (0dBW)		-44.3dB	-14.9dB
CCIR IM Dist. (½ power)		-48.1dB	-15.1dB
Rise Time		10µsecs	
Power bandwidth (<1% THD)		300Hz-15kHz	
Squarewave linearity		-63.5dB	
Phase Shift (20Hz)		10°48'	32°30'
(1kHz)		359°0'	309°30'
(20kHz)		301°40'	230°30'
Noise (A wtd, 0dBW) (½ power)		-83.5dB	-74.9dB
		-80dB	-70.5dB
Residual noise (unwtd)		-63.6dBV	-63.7dBV
Input Sensitivity (for 0dBW) (for full output)		66.6mV	500µV
		66.6mV	500µV
Disc Overload (20Hz) (50kHz)			3.45mV 185.6mV
Tape Output Impedance			5.756V (disc)/46.6kohms
Input loading			148kohm 44.1kohm
Retail Price			£575



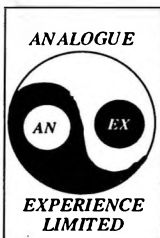


## YOUR SOUND IS AFFECTED BY THE NATIONAL GRID

THE MAINS ELECTRICITY SUPPLY IS NOT ALWAYS PERFECT WHEN IT IS GENERATED. BY THE TIME IT REACHES YOUR SYSTEM IT HAS BEEN CONSIDERABLY DEGRADED.

## CLEAN UP YOUR SUPPLY AND YOUR SOUND WITH AN A.N.E.X. POWER SUPPLY

FROM ANALOGUE EXPERIENCE LTD.  
114 MANXMAN ROAD  
BLACKBURN  
LANCS BB2 3EP  
PHONE (0254) 676538



For further information return form

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

\_\_\_\_\_ POST CODE \_\_\_\_\_

Phone No. Day \_\_\_\_\_ Evening \_\_\_\_\_

DEALER INQUIRIES WELCOME

## Now there's more than one Musical Approach!

For 2 years we have been Staffords only hi-fi specialist. Now, thanks to our customers support, we are opening a new branch in Aldridge offering the same great equipment with friendly help and advice.

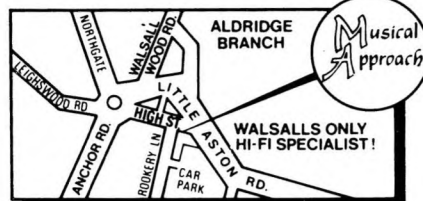
If music is important to you, phone us today - now we're doubly approachable.



We stock: Linn Products, Exposure, NVA, Onix, Ruark, Mantra, Revolver, Creek, Ariston, Royd, Audio Technica, Chord Company, Monitor Audio, Heybrook, Tannoy, Rotel, Celef, NAD, Marantz, Stax, Epos, Arcam.

● DEMONSTRATION FACILITIES ● PART EXCHANGE ● CREDIT AVAILABLE

MUSICAL APPROACH  
**STAFFORD**  
137A NEWPORT ROAD  
**0785-55154**  
ABOVE ROYAL LONDON INS  
MUSICAL APPROACH  
**ALDRIDGE**  
37 HIGH STREET  
**0922 57926**  
PARKING AT REAR



AS PERFORMANCE IS THE MAIN CRITERIA WHEN CHOOSING A HI-FI SYSTEM, LOOK NO FURTHER, SUPERIOR DESIGN COMBINED WITH PRECISE ATTENTION TO DETAIL GUARANTEE QUALITY THAT OTHERS CAN ONLY STRIVE FOR. OUR SYSTEMS WILL NEVER BE CHEAP, BUT THEN EXCELLENCE NEVER IS.

- \* PERIOD STYLE MUSIC ROOM
- \* APPOINTMENT SERVICE
- \* HAND CRAFTED CABLES
- \* 2 YEAR GUARANTEE
- \* LINN, NAIM AND ROKSAN APPROVED INSTALLER
- \* FREE DELIVERY

- \* USED EQUIPMENT
- \* QUAD 44-405 £500.00
- \* NAIM 62-140 £600.00
- \* NAIM SNAPS £150.00
- \* LINN ITTOK SILVER £230.00
- \* IMF ALS 30 PAIR £199.00

## Photocraft Hi-Fi



40 HIGH STREET,  
ASHFORD, KENT  
TEL: 0233 624441



Member of British Audio Dealers Association



# AUDION CD-1

AUDIOFREAKS, 15 LINKWAY, HAM, SURREY TW10 7QT. TEL: (01) 948 4153.



The Audion brand, formed by David Chessel who had previously worked for Audio by Design, was launched in the UK just over a year ago. The company's products are very nicely made; they have a professional, well-finished look and solid 'feel' about them, with a sensible hierarchical range. Bottom of the list is this line input-only 'CD preamplifier', followed by the *Intro* (£749) and *Reference* (£1,295) full preamps and *Finale* monoblok power amplifiers (£995 per pair).

I've used both *Intro* and *Reference* preamps previously with good results (see *Choice* March and April 1989 issues), and was a trifle disappointed when taking the *CD1* out of its packaging to find that the finish doesn't look anything like as tasty in black as it does in the company's usual gun-metal grey livery. Oh well...

Facilities are all you'd expect of a line-only preamplifier, with inputs for CD, tuner, tape with full monitor and one spare Aux input. In use the *CD1* is superbly quiet, with no irksome buzzes or hiss emanating from my system even when using valve power amplifiers with high input sensitivity. Cables were kept short, which it turns out was just as well.

## LAB REPORT

This line-only preamplifier represents an unusual blend of compromises. On the positive side there is a very flat frequency response (note phase-inverted output), excellent 0.3dB channel matching at -60dBV and an exceptionally low A-wtd noise of -104dB.

The Audion is basically a straight times-10 (20dB) gain cell, comprising a shunt-regulated ECC82 triode input that is DC-coupled to another ECC82 configured as a low output impedance cathode-follower. The power supply is double regulated using D-MOS devices and the output AC-coupled with quality polypropylenes (-3dB = 1.73Hz).

The Nobel volume pot appears to be situated right at the output of the preamp and is quite unbuffered, hence the high and variable output impedance - cable capacitance may well have some subjective influence as a result. Stereo separation falls to 35dB (20kHz) in the preceding active stage while THD and IMD are high but very constant at 2 per cent across the audio band. Much of this is derived from the limited 1.2V headroom (<1 per cent THD) of the line stage, the 3D

plot being run at the nominal CD standard of 2V.

Mechanisms as high as 6th-order are glaringly portrayed on the plots, those from  $F_{0-50k-0} - yF_{0-20k}$  ( $y = 1.5$ ) being likely to have most influence in the audio band. Clearly the topology of this valve amplifier is not conducive to linearity at low (audio) frequencies. Therefore it would be unreasonable to expect it to become more linear at radio frequencies; a deduction reflected in the broad demodulation from 1-75MHz and the sharp (+16-22dB) breaks at 90, 110 and 150MHz.

## SOUND QUALITY

This is another example where a valve (pre)amplifier measures as being far from linear in terms of intermodulation distortion, yet to my ears clearly gets 'the timing' right. The *CD1* sets up an excellent soundstage, with good portrayal of depth perspectives, and instruments are clearly audible as occupying their own space within the recorded acoustic. Of course, this kind of fidelity can only be enjoyed when listening to naturally recorded compact discs or tapes (or live radio broadcasts for that matter), and, to my mind, what is likely to let the *CD1* down most in a hi-fi system is not the unit itself, but the source material for which it was designed.

Overall the preamp's character is 'sweet' and easy on the ear, combined with an impression of fine bandwidth and dynamics. Using CD as source, I preferred the easy-going sound balance of the *CD1* to both the line stages of the Concordant *Excelsior* preamp and Audio Innovations *Series 400* integrated amplifier (both tested this month), though ultimately I was hard-pushed to hear much subjective difference between this Audion and the CD input of the Rose *RV-23*. In fact, close A/B comparison reveals the Audion to be just slightly superior in its preservation of instruments' leading edges - but this only goes to show what a good value all-rounder the Rose amplifier is.

## CONCLUSIONS

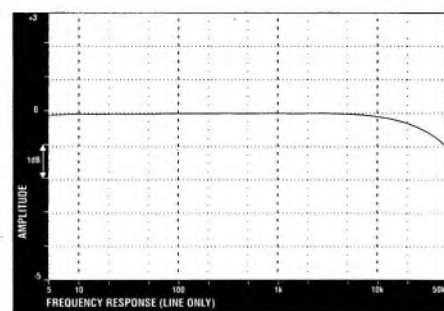
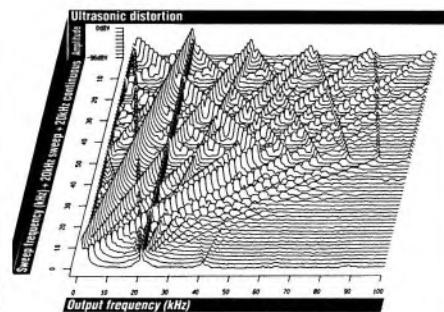
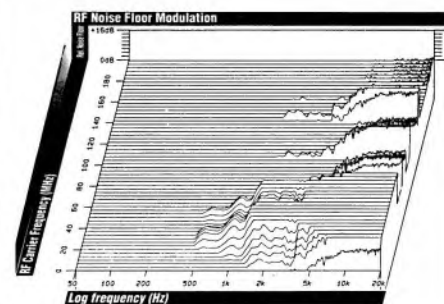
I'm not sure how I feel about the *CD1*. Yes, if like many hi-fi enthusiasts you find the performance of CD players unnaturally brittle and synthetic sounding, you'll judge the *CD1* a significant advance in the art of music mak-

ing. And I understand that in some specialist hi-fi shops this Audion unit has been proving very popular with customers.

Thing is, I can't get away from the simple logic that if you don't own a record player - which needs its own very special preamplification and equalisation stages - then the best preamp in the world is no preamp at all. So why spend £399 on a valve none-preamp?

## TEST RESULTS

	Aux/CD
Stereo separation (20Hz)	89.6dB
(1kHz)	58.7dB
(20kHz)	34.7dB
Channel Balance (1kHz, 0dBV)	0.15dB
(-20dBV)	0.16dB
(-60dBV)	0.31dB
Total Harmonic Dist (0dBV, 1kHz)	-34.0dB
(20kHz)	-34.9dB
CCIR Intermod. Distortion (1:1)	-33.6dB
Phase Shift (20Hz)	180°
(1kHz)	180°
(20kHz)	169°12'
Squarewave linearity	-71.5dB
Noise (A wtd, 20Hz-20kHz)	-104.4dB
Residual noise (unwtd)	-98.6dB
Input Sensitivity (for 0dBV)	105.9mV*
Line overload (20Hz)	1232mV*
(1kHz)	1219mV
(20kHz)	1163mV
(50kHz)	1059mV
Preamplifier Output (max)/Impedance	4.360V/17.2kohm**
Tape Output (max)/Impedance	>16V/35.4ohm
Retail Price	£399



# HEYBROOK POINT FIVE



**HI-FI NEWS & RECORD REVIEW**  
 THE FUTURE OF THE PAST

## A REALLY DIFFERENT LOW COST TWO WAY LOUDSPEAKER

Heybrook's Pint-Size Point Five is the latest addition to the ranks of low cost two-way loudspeakers. But in a world which is mostly populated by clones, makeweights and also-rans, this one really is different. What the Point Five is really all about, though, are the 3 qualities, speed, resolution and control. Speed in this context means, for example, that percussive piano phrases have real attack and force. There's enough substance backing it up to add some flesh to the bones, too, so the music also has body and a well defined resonant structure. The very high levels of resolution achievable with this design were plainly apparent on a wide range of materials, control was evident all the time, in the way notes were released, in the build-up to crescendos, in the tidiness of the bass, in the precision with which stereo images were projected into the space around, and in front of, the speakers.

Finally - and on a resoundingly positive note - I must mention the unusually dynamic nature of the Point Five. Unlike most smallish loudspeakers, it doesn't appear to compress or change in sound as it goes loud, and with this unusual freedom from squash, it's quite easy to take the speaker right up to, and even beyond, its working dynamic range. In short, this is one budget loudspeaker that works. Instead of trying to squeeze every last Hertz in the bass, or decibel in level, Heybrook have concentrated on making a loudspeaker that is, above all, detailed, articulate and dynamic, whilst retaining excellent control. It's a powerful list of virtues at the price.

## WHAT HI-FI?

FREE! WHAT CD? & DIGITAL AUDIO Tells you the best hi-fi to buy

### The Heybrook is an excellent all-round design

that could easily be awarded top marks for compatibility. It is easy to drive, very clean-sounding and it is well-balanced at both bass and treble extremes. One excellent feature of the Heybrook speaker is its full bass performance. The treble frequencies sounded excellent too, and the sound was unusually clean and dynamic - particularly when playing material with lots of cymbal work. Indeed, the little Point Fives often sounded the equal of a much bigger and much more expensive design. Stereo imagery was pin-point sharp and highly detailed, yet not in a cold or dissecting manner. The Heybrook Point Five is an excellent example of cost-effective engineering where economies have been made to overall advantage. From the clever design of the cabinet with its medite top and bottom pieces to the simple crossover and specially designed bass/mid unit, the whole speaker is an example of how to build a top class small speaker at a very reasonable selling price.

# WHAT THEY SAY ABOUT US SOUNDS GOOD!

As you can see from these recent review extracts the Heybrook Point Five has really impressed.

The Point Five is just the latest in a line of Heybrook successes. Savour aural excellence from an award winning range of audio products; for further details send the coupon below.



## HEYBROOK

For further information, dealer list and full review reprints please complete and return this coupon specifying products:

NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 POSTCODE \_\_\_\_\_

HEYBROOK HI-FI LTD., ESTOVER CLOSE, ESTOVER, PLYMOUTH DEVON TEL: 0752 780311

## HI-FI Answers Sound quality is, in a nutshell excellent

The speaker is always under firm and positive control, transient and dynamic behaviour are both exemplary or better, and bass quality is fast, pitch accurate and has lots of drive. The Point Five is simply very refined, and gives a 'big' sound with excellent dynamics and space, and very good resolution of detail. Best of all, though, is the midband which has a rare openness and an alive quality that is not easily mistaken. This is a loudspeaker where, given a decently well behaved reproduction system, the stereo soundstage comes out more than half way to meet the listener. I believe that the new budget Heybrook is a significant product. By designing intelligently within tight cost constraints, the company have come up with something genuinely new and with obvious potential design stretch for future up-market models to exploit. Meanwhile, the Point Five's lively, forthcoming sound is very much in tune with what is required of a small, modern speaker. I'm positive it's going to be enormously and deservedly successful.

## THE HIT LIST

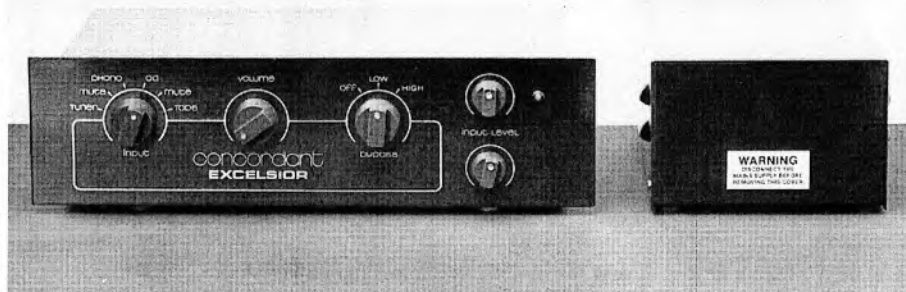
**SPEAKERS**  
**HEYBROOK POINT FIVE**  
 MC, 2W, CB  
 Review: January 1988 Design/  
 Manufacture: UK

The new Point Five, a small two-way loudspeaker from Heybrook, marks a break with the past in more ways than one. The enclosure is easily the most novel feature, the baffle being part of the main structure rather than being mounted in afterwards as usual. Heybrook had to use new construction techniques to achieve this, the benefit being a structure with greater physical integrity and which is easier to control. Internal wiring is solid-core, which should be observed elsewhere in the partnering system too, and the crossover is also built in line with solid-core ideas as far as possible. Used a few inches clear of a wall the Point Fives have a bass and midrange that are marvellously expressive and articulate, and exhibit real control and excellent stereo. On very early samples the tweeter was slightly uncouth, but this trait has now been cured.

# CONCORDANT EXCELSIOR

CONCORDANT AUDIO, 14 GLYN CLOSE, BARWELL, LEICS. LE9 8GL. TEL: (0455) 843752.

RECOMMENDED



For some six weeks or more I've been enjoying the music making of Concordant Audio's *Excelsior* preamp, which is positioned in this company's range between a five valve dual mono line-only preamplifier called *Exhilarant* (\$675) and its top of the range *Exquisite* model (\$1,400), a two-box eight valve dual mono design with separate two valve regulated power supply. Concordant is a small family business run by proprietor and electronics designer Doug Dunlop, his company having first come to my attention over seven years ago when I learned about its modifications to old Quad II valve amps.

In addition to sprucing up vintage valve electronics, these days Concordant also produces its own hand-made tube preamplifiers.

Without wanting to be too magniloquent, especially since beauty is clearly in the eyes of the creator and, it seems, many owners, the *Excelsior* has that unmistakable old-fashioned, 'made by a cottage industry' look about it - from the unusual deep maroon finish on the front panel with heavy gold legends (which is bound to make it look out of place next to any other components you may own) right down to the control knobs taken straight out of RS Components' catalogue. On the rear, the input/output sockets are upside down, with left channel connections running along the bottom (still, if Audio Research can ignore common hi-fi practice why not Concordant?), while the separate left and right input level control knobs, which afford channel balance, are similarly not where you'd expect them, the uppermost knob controlling the right channel level.

Other controls are master volume, input select for phono (MM)/CD/tuner/tape (with two mute positions), and a bypass control which takes the source selector and input level controls out of circuit for the best possible sound when playing vinyl records.

## LAB REPORT

Concordant uses an external DC supply that features its own GEC 5965 computer valve, feeding both heater and HT rails and reducing the (unwtd) hum and noise to a spectacular  $-108\text{dBV}$  (0.004mV). Lowish current ECC83 double triodes are used throughout the preamp itself, RIAA equalisation being accomplished by active feedback from the output of the second ECC83 to the cathode of the input ECC83.

The disc response pivots about 1kHz with a  $-1\text{dB}$  shelf at 100Hz and  $+0.6\text{dB}$  peak at 9kHz while the full 56dB gain of the preamp requires just 1.59mV to realise an output of 1V. In fact the quoted maximum output of 5.6V refers to 1 per cent THD, though the true hard clip point is only reached at an output of 31.5V! The output is phase-inverting, by the way, so users might care to experiment with speaker phasing.

In the line stage which is connected directly to the output attenuator, two triode elements are used per channel. Hence the high and variable output impedance (the huge  $-60\text{dBV}$  channel imbalance of 14-21dB will vary from pot to pot). Oddly enough, Concordant has correctly buffered the tape output down to a sensible 121ohm! THD was a respectable 0.45 per cent via disc while the CCIR IMD registered just 0.01 per cent.

This is reflected on the 3D plot where there is a minor predominance of 3rd-order harmonic and intermodulation routes. These might harden or 'glaze' the sound very slightly but the mild  $+6\text{dB}$  RF IMD (35-70MHz) is perhaps a better pointer to the likely sonic prowess of this preamp.

## SOUND QUALITY

Extremely vivid and explicit, the *Excelsior* possesses the ability to create soundstages of exceptional depth and clarity. Instruments and voices are clearly separated and firmly located in space, emanating from the kind of 'inky black silences' which are normally only the province of exceptional transistor designs. (Many solid state devices, meanwhile, although apparently 'quiet' due to lack of hiss and/or hum noise, still mask detail in a kind of electrical 'hash').

Listening to recordings of both the analogue and digital variety through the *Excelsior* at times proved to be a revelatory experience. Despite just a hint of brittleness in the extreme treble, the preamp's slightly bright character translates into a superbly detailed sound - as detailed, I do believe, as any preamp I've ever used at home, at any price. It sounds 'wide open' and dynamic, without ever going over the top.

## CONCLUSIONS

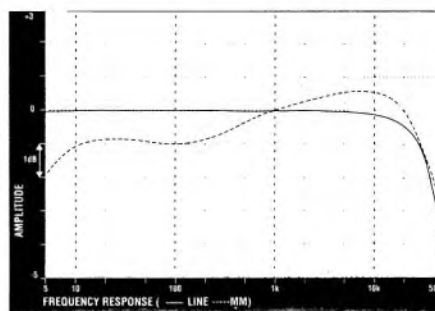
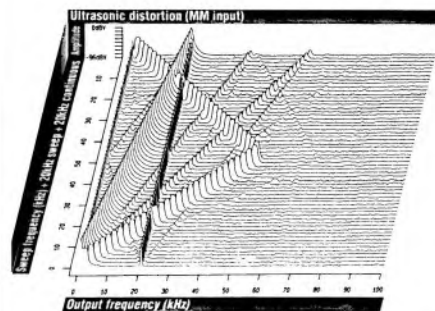
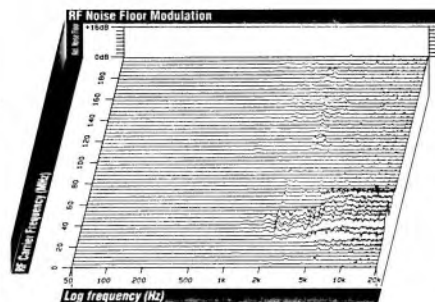
You can spend less on a good quality valve preamp, but you won't find anything as detailed and as transparent as the *Excelsior*

without diving into the world of really exotic high-end components, which come with exotic price tickets. This is one of the finest preamplifiers I've ever heard, regardless of price, and as such should be viewed as a true bargain by those audiophiles who don't mind the preamp's unglamorous appearance.

With the *Excelsior* sounding this good, I can't help wondering what on earth Concordant's top line *Exquisite* preamp might be capable of.

## TEST RESULTS

	Aux/CD	MM
Stereo separation (20Hz)	84.7dB	60.1dB
(1kHz)	66.0dB	67.2dB
(20kHz)	41.0dB	42.8dB
Channel Balance (1kHz, 0dBV)	0.02dB	0.05dB
(-20dBV)	0.13dB	0.11dB
(-60dBV)	2.11dB	14.6dB
Total Harmonic Dist (0dBv, 1kHz)	-52.9dB	-46.2dB
(20kHz)	-55.4dB	-48.2dB
CCIR Intermod. Distortion (1:1)	-65.9dB	-73.4dB
Phase Shift (20Hz)	180°0'	180°0'
(1kHz)	180°0'	138°40'
(20kHz)	162°0'	95°30'
Squarewave linearity	-81.9dB	
Noise (A wtd, 20Hz-20kHz)	-103.1dB	-74.2dB
Residual noise (unwtd)	-108.5dBV	-108.4dBV
Input Sensitivity (for 0dBV)	89.75mV	1.588mV
Disc overload (20Hz)		27.9mV
(1kHz)		245.5mV
(20kHz)		2250mV
(50kHz)		3349mV
Preamplifier Output (max)/Impedance	5.23V/8.897kohm*	
Retail Price		£856



# PROGRESSIVE AUDIO

Situated 5 minutes off the M2 near Rainham, Kent we offer first class no obligation demonstrations here or in the more realistic environment of your own home.

## NEW THIS MONTH AND ON DEMONSTRATION

PROAC RESPONSE II LOUDSPEAKERS  
TDL STUDIO 1 LOUDSPEAKERS  
AUDIO INNOVATIONS SERIES 400  
INTEGRATED AMP  
CONRAD JOHNSON CDF1 CD PLAYER  
SONOGRAPHE PRE AND POWER AMPS  
CONRAD JOHNSON MOTIF AMPLIFIER RANGE  
ROCK REFERENCE TURNTABLE

AND COMING JUST AS SOON AS WE CAN GET THEM:  
SOUND LAB HYBRID FULLY ELECTROSTATIC LOUDSPEAKERS  
PLUS RAY LUMLEY AMPLIFIERS AND CARDAS CABLE

Plus the usual range of superb equipment as follows:

Michell, Voyd, Valdi, Systemdek, Rock, Kuzma,  
Rega Arms, Excalibur, Helius, SME, Stogi and Stogi,  
Reference, Audionote, Goldring, Koetsu, Kiseki,  
Milltek, Ortofon, Audio Technica, Decca, Rose Preamp,  
Audion, Audio Innovations, Quicksilver, Kelvin Labs,  
Albarray, Sugden, Proac, TDL, Glastonburys, Snell,  
Spica, JPW, Celef, Alexander, Marantz CDPs, Supra,  
Kimber, Vecteur, Target, Pirates.

PHONE DAVE ON 0634 389004

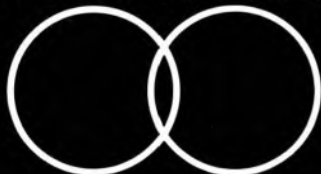
# SOUND BEYOND THE FINAL FRONTIER

Audio  
PROJECTS

45 HEADINGLEY LANE, LEEDS 6  
0532 304565



3ADABADABADABADA



**sound advice**

THE MIDLANDS LEADING  
BRITISH EQUIPMENT SPECIALISTS,  
FOR OVER A DECADE

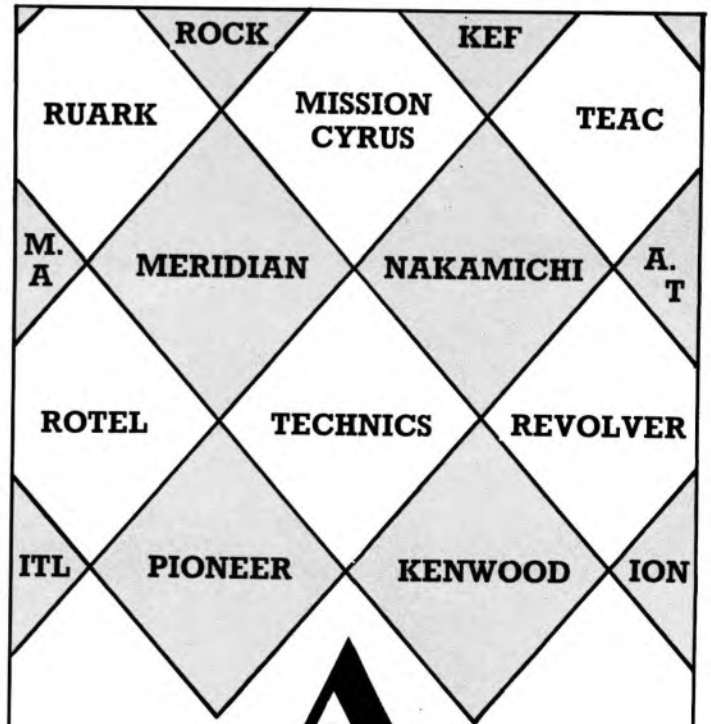
NAIM LINN MISSION ROYD  
A & R ROKSAN REGA MORDAUNT SHORT  
CREEK EPOS CAMBRIDGE AUDIO  
MONITOR AUDIO HEYBROOK YAMAHA  
NAKAMICHI ROTEL  
REVOX SENNHEISER

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

3ADABADABADABADA



31 ST. CAMBRIDGE HI-FI 1-3  
CUTHBERTS STREET BEDFORD 0234-325035  
HAWTHORN WAY CAMBRIDGE 0223-67773



# ROSE RV-23

ROSE INDUSTRIES, 142 BRASENOSE ROAD, DIDCOT, OXON OX11 7BS. TEL: (0235) 814631.

RECOMMENDED



When we last tested a group of valve amplifier components, which I'm embarrassed to have to admit was 14 months ago (where does the time go?), the *RV-23* preamplifier from a newly formed British company called Rose Industries was a surprising product. In a world where the manufacturing of valve amplifiers seems to have become the province of, at the one extreme, producers of extremely expensive high-end components, and at the other, small 'enthusiast' companies who are limited in resources so their products inevitably end up looking 'home made', the *Rose RV-23* appeared as a thoroughly well designed and correctly production engineered product complete with a sensible price tag.

The controls 'feel' right, and inside the bonnet the high quality of construction is self evident. But what spoiled the *RV-23*, when I first listened to it in a transparent hi-fi system, was the disappointingly veiled and muddled sound on the disc input. Later in the test lab we discovered this input had a suspiciously low overload margin, which may well have been causing the muddling evident on complex musical passages, and so we promised ourselves at the time that we'd try another sample of the Rose when opportunity, er, arose.

And we're glad we did. The unit has been modified, with improvements to some resistors and capacitors, a new Alps volume control, and additional hard-wiring. A major design change has been to employ bipolar devices in some areas of the circuit (so the *RV-23* is now a 'hybrid') in order to improve noise, overload and compatibility. As a consequence, the sensitivity of the phono stage can now be altered at the factory - so strictly speaking for top performance you should specify whether you will be using a high output cartridge or a low output cartridge with some form of step-up transformer (the latter often producing a much higher signal than the former).

## LAB REPORT

A glance at the 3D plot shows that harmless 2nd-order harmonic and IM products still dominate, though THD in itself is reduced from 0.58 per cent to 0.29 per cent via MM disc. The great reduction in  $F_{0-50k-0} - F_{20k}$  as well as CCIR IMD (now 2.8 per cent) is a reflection of the improved HF performance

of the disc stage. Passive RIAA eq is still employed but now features a -3dB point of 6.5Hz (5Hz via line input).

Rose has opted for an active line stage which offers a moderate 12-13dB gain via one half of an ECC82 double-triode. THD via line has therefore increased to 0.08 per cent with IMD at 0.04 per cent but the egress of hum products has been curtailed, the unwt'd noise figure hitting a low -93dBV. Unfortunately the low white-noise floor only serves to reveal more of the preamp's sensitivity to AM/RF noise, indicating that it may sound quite muddled or grainy with some CD players, so careful auditioning in your hi-fi shop would be advisable.

Channel balance is pretty much the same as it was but improvements in board layout have led to an increase in channel separation at all frequencies. RF IMD aside, the *RV-23* is clearly an evolved and much improved product.

## SOUND QUALITY

The sound is slightly sharper and better focused than before, while the phono (disc) input has improved beyond recognition. Stage depth and transparency aren't quite in the top league, but without doing A/B comparisons with superior components you'll find it difficult to criticise the performance.

Tonally 'sweet' and even through the critical midband, the *RV-23* oozes 'class'. It poses that effortlessness which promotes long term fatigue-free listening. Phono *and* line inputs are now of a similarly high standard, and although some of the warmth and euphony has been lost in the redesign the preamp sounds 'faster' and more informative for it. What really stops it from being all things to all audiophiles is the slight reticence in the bass. The preamp doesn't quite reach the lowest octaves. Remember, though, that in the average sized hi-fi system this will never be apparent. You'll need a room of luxurious proportions and a very large system before the *RV-23* becomes the limiting factor here.

## CONCLUSIONS

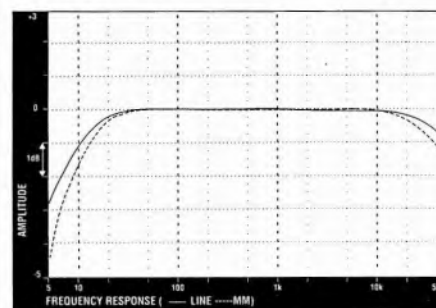
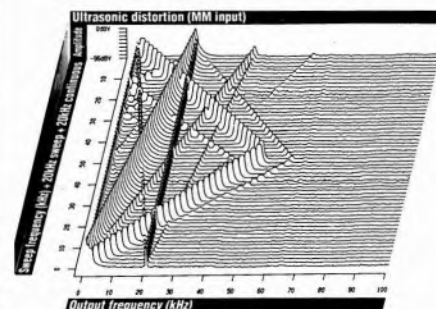
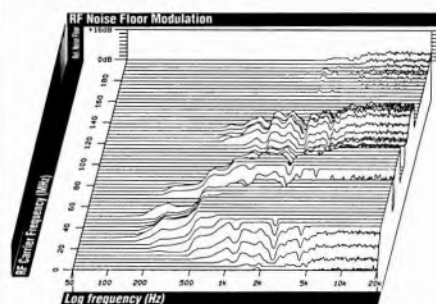
This preamp now has been regarded as an audiophile bargain. Facilities are minimal, with no balance control or proper tape monitor for three-head cassette decks, but then the *RV-23* is a purist product for real hi-fi

enthusiasts and in its sound quality it delivers the goods.

If you're looking for the best sound at the lowest price there are other valve preamps available in this country, but only of the hair shirt variety. This one is a high quality bit of kit, built to last, and would be viewed a 'Best Buy' if any preamp costing almost £400 could ever be described in such terms. Audiophiles will certainly regard it a bargain, and a *Choice Recommendation* is mandatory.

## TEST RESULTS

	Aux/CD	MM
Stereo separation (20Hz)	113.3dB	97.5dB
(1kHz)	83.0dB	66.3dB
(20kHz)	56.4dB	41.1dB
Channel Balance (1kHz, 0dBV)	0.04dB	0.06dB
(-20dBV)	0.04dB	0.09dB
(-60dBV)	1.05dB	2.27dB
Total Harmonic Dist (0dBV, 1kHz)	-62.3dB	-50.5dB
(20kHz)	-61.9dB	-43.5dB
CCIR Intermodulation Distortion (1:1)	-60.7dB	-36.8dB
Phase Shift (20Hz)	180°	180°
(1kHz)	180°	131°30'
(20kHz)	167°30'	90°0'
Squarewave linearity	-89.3dB	
Noise (A wtd, 20Hz - 20kHz)	-97.8dBV	-83.4dBV
Residual noise (unwtd)	-93.3dBV	-94.2dBV
Input Sensitivity (for 0dBV)	228.2mV	2.380mV
Disc Overload (20Hz)		13.21mV
(1kHz)		248.5mV
(20kHz)		552.4mV
(50kHz)		500.5mV
Preamplifier Output (max)/Impedance		15.32V/248ohms
Retail Price		£395





*Rupert is pleased to participate  
in festive carryings-on to the  
accompaniment of first-class  
audio-visual equipment purchased,  
naturally enough, from Chew & Osborne.*



*... sounds outstanding*

148 HIGH STREET · EPPING · ESSEX  
(0378) 74242

26 KING STREET · SAFFRON WALDEN · ESSEX  
(0799) 23728

70 SOUTH STREET · BISHOP'S STORTFORD · HERTS  
(0279) 656401

# The Hi-Fi HIT LIST

Denon, Rotel, Dual, JPW, Creek, Monitor Audio, Musical Fidelity, Rogers, Quad, KEF, Audiolab, Mordaunt Short, Yamaha, Cambridge Audio, Celestion, Systemdeck, Ruark, Nakamichi, Marantz, Revox, Acoustic Energy, Roksan, Krell, Audio Research, Magneplanar, JBL

SUPPORTED BY TRAINED  
HELPFUL STAFF AND  
FULL TWO YEAR  
GUARANTEE

A MEMBER OF BADA

*Steve  
Boxshall*  
**AUDIO**

**41 VICTORIA ROAD, CAMBRIDGE: (0223) 68305**

# To get perfect hearing try this eye test.

Hi Fi Experience is a very different type of Hi Fi outlet. It's the very best.

It's designed for people who want to see and hear the best selection of the finest equipment technology has to offer, and who want to hear expert sound advice, not sales patter.

You'll find demonstration rooms at your disposal, where you can hear a system, or combination of separate pieces of equipment in total privacy.

When you've made your choice, we'll offer to install it in your home – not merely deliver it – free of charge. In addition we offer a 14 day no quibble exchange period, and a full two year guarantee.

## The best choice

Each of our branches has a fantastic selection of hi-fi equipment, with one common factor. Quality.

Take the Mission range of speakers for example.

Combining state of the art technology with good design, they sound as good as they look. But don't just take our word for it. Hear for yourself, at your local Hi Fi Experience.



T H E  
B E S T  
A D V I C E,  
T H E F I N E S T  
S Y S T E M S , T H E  
G R E A T E S T V A L U E .  
T H E H I - F I E X P E R I E N C E

# HI-FI EXPERIENCE

*You'll like the sound of us*

**BADA**  
THE ULTIMATE IN  
SOUND ADVICE

**LONDON**  
Tottenham Court Road, London W1  
Lion House, 227 Tottenham Court Road  
Tel: 01 580 3535

### Open as usual during refurbishment.

Our Lion House branch is currently being extensively refurbished to be the hi-fi store for the nineties. Don't be put off by the scaffolding, most of the new stock is already in, and we're open for business as usual.

**Alfred Place, London WC1**  
32/34 Alfred Place, Store Street Tel: 01 631 4917

**Camden, London NW1**  
2/4 Camden High Street Tel: 01 388 1300 (round corner from Mornington Crescent tube)

**YORKSHIRE**  
Bradford Rawson Square (near John St Market)  
Tel: 0274 309266

**MIDLANDS**  
Birmingham Superfi, 67 Smallbrook . Queensway.  
Tel: 021 631 2675

**Leamington Spa** 49 Park Street Tel: 0926 881500  
**SCOTLAND**  
**Glasgow** 145 Bath Street Tel: 041 226 4268

# 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

RADFORD HI-FI, 52-54 Gloucester Rd, Bristol. (0272) 428247. Linn, Naim, Mission, Denon, Nad. 3 dem rooms. Installation. Access, Visa + credit. Service dept. BADA MEMBER **3422**

ABSOLUTE SOUND AND VIDEO, 65 Park St, Clifton, Bristol. (0272) 264975. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER **3424**

PAUL GREEN HI-FI LTD, Kensington Showrooms, London Road, Bath. (0225) 316197. Linn, Musical Fidelity, Krell, A&R, Creek, Rogers, Quad, Cust. car park. Best selection in the West. BADA MEMBER **3426**

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, Incatech, JVC, Kenwood, Marantz, Monster, NAD, Nakamichi, etc. Credit to £1,000. Access, Amex, Diners, Visa. Service dept. Dem room facilities. Open 6 days, 9.5.30, 6p.m. Friday.

CAMBRIDGE HI-FI, 31 Cuthbert St, Bedford. (0234) 325035. Mission-Cyrus, Rotel, Kenwood, Pioneer, Mantecore, Revolver, Ariston, ITL, KEF, Monitor Audio. Single speaker dem room. 9.30-5.30 6 days. Free installation. Service Dept. Visa, Access. Credit facilities.

## BERKSHIRE

NEWBURY AUDIO, 2 Weavers Walk, Northbrooke Street, Newbury, Berkshire RG13 1AI (0635) 33929. 6 days 9.30-6.00. Linn, Naim, Roksan, Exposure, Creek, Epos, Royd, Denon, Nakamichi. Single speaker dem. room. Appts necessary. Home trial facilities. Free installation. Service department. Late appointments. Access, Visa. Interest free credit subject to status. 6 days 9.30am-6.00pm.

READING HI-FI CENTRE, 4 Queen's Walk, Reading RG1 7QF. (0734) 585463. 'The best equipment, advice and service from Berkshire's premier Hi-Fi emporium'. BADA MEMBER **3427**

## BUCKINGHAMSHIRE

TECHNOSOUND, 7 Graville Square, Willen Centre, Milton Keynes. (0908) 604949. Bang & Olufsen, Denon, Rotel, Technics, Yamaha and enthusiast hi-fi. Also at Luton and Dunstable. BADA MEMBER **3428**

AUDIO INSIGHT LTD, 53 Wolverton Rd, Stony Stratford, Milton Keynes. (0908) 561551. Arcam, Audiolab, Heybrook, Ion, Linn, Meridian, Quad and more. Access, Visa. Finance. Dem. room etc. BADA MEMBER **3429**

AYLESBURY HI-FI FIDELITY, 98 Cambridge St, Aylesbury. (0296) 28790. Denon, Dual, Exposure, Heybrook, Marantz, Musical Fidelity, NAD, Roksan, Rotel, Systemdek. 2 Dem rooms, appointment reqd. Mon-Fri 10-6, Sat 9.30-5.30. Home trial, free installation, credit to £1,500. Access, Amex, Diner, Visa. Service dept.

## CAMBRIDGESHIRE

CAMBRIDGE HI-FI, 1 Hawthorn Way, Cambridge. (0223) 67773. Ariston, ITL, KEF, Mission Cyrus, Monitor Audio, Pioneer, Revolver, Technics, Thorens, Kenwood. All credit cards.

STEVE BOXSHALL AUDIO, 41 Victoria Rd, Cambridge CB4 3BW. (0223) 68305. 10-6 - 6 days. 3 dem rooms, home trial, appts. preferred. Free installation and service dept. Access, Visa & credit. BADA MEMBER **3430**

STILTON AUDIO, 489 Lincoln Road, Peterborough. (0733) 558838. A&R, Cyrus, Exposure, Harman Kardon, Linn, Meridian, Mission, Musical Fidelity, Roksan, Yamaha. Home trial, free installation. Credit facilities. Access, Visa, Amex. Mon-Fri 10-6. Sat 10.5-3.0. Service dept.

## CHESHIRE

ASTON AUDIO, 4 West St., Alderley Edge. (0625) 582704. Wide range of specialist audio, interest free credit. Visa. Access. Home trial. Closed Mon. BADA MEMBER **3431**

DOUG BRADY HI-FI, Kingsway Studios, Kingsway North, Warrington. (Padgate 0925) 828009. Largest choice of specialist Hi-Fi in N.W. All credit cards. 3 Dem rooms. Open 6 days. BADA MEMBER **3432**

NEW DAWN HI-FI, 1-3 Castle St, Lower Bridge St, Chester. (0244) 24179. Linn, Quad, Technics, National Panasonic, Denon, Rotel, Dual, Meridian, Aiwa, Philips. SWIFT OF WILMSLOW, 4-8 St Annes Parade, Wilmslow. (0625) 526213. Arcam, Denon, Kenwood, Musical Fidelity, Marantz, NAD, Cambridge. 2 dem rooms. Tues-Sat 9.15-6pm. No pressure! BADA MEMBER **3433**

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 **3434**

## DERBYSHIRE

ACTIVE AUDIO, 12 Osmaston Rd, The Spot, Derby. (0332) 380385. Arcam, Ariston, Celestion, Denon, Heybrook, Kef, Cyrus, Musical Fidelity, Marantz, Revox, Rotel, Rogers, etc, etc. Demonstration and home trial facilities. Account and credit cards. Ring for opening times and free 'Fact Pack'. BADA MEMBER **3435**

## DEVONSHIRE

CHELSTON HI-FI, 38 Walnut Road, Chelston, Torquay, Devon TQ2 6HS. Tel: (0803) 608863. Denon, Marantz, Rotel, Musical Fidelity, Acoustic Energy, NAD, Castle, Heybrook, Celestion, JPW etc. 2 dem rooms. Home trial. Free installation. Access, Visa, Amex, Diners, Hi-Fi Markets Chargecard. Credit facilities. 9.30-7.30 Mon-Fri, 9.30-6 Sat.

## DORSET

THE AUDIO SHOP, 128 Poole Road, Westbourne, Bournemouth. (0202) 762160. Arcam, Quad, Michell, Marantz, Linn, Celestion, Spendor, Cambridge Audio, Absolute Sounds, Revox. 2 dem areas. Appts nec. Home trial. Free installation. Access, Visa. Tues-Frie 10-6, Sat 9-5.

## ESSEX

A.T. LABS, 442/4 Cranbrook Rd, Gants Hill, Ilford. (01) 518 0915. Mon-Sat, 10-6. Two dem rooms. Access, Visa. Sony Hi-Fi News Best Dealer '86 & '88 (National). BADA MEMBER **3436**

RAYLEIGH HI-FI, 44a High Street, Rayleigh, Essex. (0268) 779762/747571. 216 Moulsham St, On-the-Parkway, Chelmsford, Essex. (0245) 265245. A&R, Creek, Cyrus, Denon, Epos, Ion, Linn, Mission, Naim, Quad, Rega, Roksan, Rotel, Royd, 0% finance. BADA MEMBER **3437**

BRENTWOOD MUSIC & HI-FI CENTRE, 2 Ingrave Rd, Brentwood. (0277) 221210. Alphason, B&W, Cambridge Audio, Denon, Harman Kardon, Marantz, QED, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9.30-5.30 (Thurs from 10am, Sat from 9am). Free installation, credit facilities. Access, Visa, Hi-Fi Markets. Service dept.

LYON AUDIO, 16 Peartree Business Centre, Peartree Road, Stanway, Colchester, Essex CO3 5JN. (0206) 560259. Quad, Rogers, Mission, Denon, Celestion, Marantz, Audiolab, Heybrook, Rotel, NAD. Dem facilities. Mon-Sat 9-6. Installations. Access, Visa, Hi-Fi Markets, Instant credit. Service dept available.

PRO MUSICA, 6 Vineyard Street, Colchester. (0206) 577519. Linn Products, Naim Audio, Rega Research, Creek, A&R Cambridge, Ion Systems, Denon, Rotel, Epos, Ruark etc. Two single speaker dem rooms. Credit facilities. Access, Visa. Appointments bookable. Mon-Sat 10am-6pm.

THOMSONS, 2 High Street, Great Baddow, Chelmsford, Essex Tel (0245) 71465. JVC, Kenwood, Mitsubishi, Toshiba, Tannoy, Mordaunt-Short, Acoustic Research, Wharfedale, Philips, Audio-Visual dealer. Home trial. Free installation. Service dept. Access, Visa, HP. Open 9-1, 2-5.30 Mon-Sat. Open 9-1 Wed.

## GLOUCESTERSHIRE

ABSOLUTE SOUND AND VIDEO, 40/42 Albion St, Cheltenham. (0242) 583960. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER **3438**

AUDIO EXCELLENCE, 58 Bristol Road, Gloucester. (0452) 30046. Audio Research, Dual, Krell, Linn, Magneplanar, Naim, NAD, Yamaha and lots more. Closed Mon. BADA MEMBER **3439**

## HAMPSHIRE

ABSOLUTE SOUND AND VIDEO, 4 Feathers Lane, Basingstoke. (0256) 24311. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER **3440**

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 **3441**

HOPKINS HI-FI, 38/40 Fratton Rd, Portsmouth PO1 5BX. (822155) 830753. Technics, Quad, Monitor Audio, Tannoy, Denon, Nad, Heybrook, Ariston, Onkyo, plus others. Dem facilities, appointments necessary. Access, Visa. 9-5.30. Open to 6 Thurs. Closed Wed. Service dept.

## HEREFORDSHIRE

ENGLISH AUDIO, 95 Whitecross Road, Hereford. (0432) 355081. Musical Fidelity, Pink Triangle, Heybrook, Arcam, Nakamichi, Systemdek, Denon, Cambridge Audio, Rogers and others. Dem room. Home trial. Free installation. Service dept. Access, Visa. Open Mon-Sat 10am-6pm.

## HERTFORDSHIRE

AUDIO IMAGE, 15 Middle Row, Stevenage, Herts SG1 3AW. Tel: 0438 360606. Aiwa, Goodmans, Harman Kardon, JBL, JVC, Kenwood, Panasonic, Pioneer, Sony, Technics. Dem room & lounge. Home trial. Free installation. Service dept. Access, Visa. Instant credit £1500. Closed Weds. Open 9-6.

ACOUSTIC ARTS Ltd, 101 St Albans Rd, Watford, Herts. (0923) 45250. A&R, Audiolab, Denon, Magneplanar, Quad, Rogers, Meridian, TDL, Jadis, Krell. Mon-Sat 9.30-5.30. BADA MEMBER **3442**

THE AUDIO FILE, 27 Hockerill St, Bishops Cleeve, Herts CM23 2DH. (0279) 506576. 9.30-5.30 6 days. Dealer Of The Year 1988/89. Linn, Naim, Rega, Quad, Cyrus, Arcam, Musical Fidelity. 0% credit. BADA MEMBER **3443**

HYPERTEC, 6 Bancroft Road, Hitchin, Herts. (0462) 452248. B&W, Denon, Dual, Marantz, Pioneer, Rotel, Tannoy, Technics, Wharfedale, Bang & Olufsen. 2 dem rooms without appointment. Private dem room with appointment. Home trial. Free Installation. Service dept. Access, Visa, Hypertec creditcharge. 9.30-6.30 6 days per week. Evening dem by appointment.

## ISLE OF MAN

ISLAND COMPACT DISC CENTRE, Parliament Square, Ramsey. (0624) 815521. Arcam, Ariston, Audio Innovations, Celestion, E.A.R., Marantz, QED, SD Acoustics, Snell, Sugden. Mon-Sat 9-5.00. Dem and home trial facilities. Free installation. Full credit, no limit. Access, Elite. Service dept.

## KENT

JOHN MARLEY HI-FI CENTRES, 2 Station Rd West, Canterbury (Canterbury) 69329. Also at Dover - (0304) 207562. B&W, Heybrook, Magnum, M.Y.S.T., Nakamichi, Pink Triangle, Rotel, Sansui, Technics, Quad. Dem and home trial facilities. Mon-Sat 9-5.30 closed Thurs. Free installation. Credit to £1,000. Access, Visa, Creditcharge. Service dept.

VJ HI-FI, 29 Guildhall St, Folkestone. (0303) 56860. Mon-Sat 9-6. NAD, Yamaha, Marantz, Cambridge Audio, Denon, Kenwood, Rogers, Dual, Musical Fidelity, Quad. Dem and home trial facilities, free installation, credit to £1000. Amex, Diners, Visa, Access. Service dept.

PHOTOCRAFT HI-FI, 40 High St, Ashford. (0233) 624441. No. 1 in Kent for Linn, Naim, Rega, Roksan, Exposure, Onix, Epos, Royd, Creek. But before you choose equipment choose where to buy it. Dem room, appts. necessary. Home trial and free installation. Visa, Access, Bada Chargecard. 9-5.30 Mon-Fri (Wed & Sat to 5 only). Service Dept. BADA MEMBER **3444**

## 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

MJS HI-FI, 80 Stapleton Lane, Barwell, Leicester LE9 8HE. (0455) 469777. The Rock, Audio Innovations, Kelvin Labs, Snell, Hellius, Sugden, Ruark, Concordant, Valdi, JPW. Our main aim is for our customers to enjoy



music. Dem and home trial facilities. Mon-Sat 9.30-7.00. Free installation and service dept. Visa, Access.  
**THE LEICESTER HI-FI CO**, 6 Silver Walk, St. Martins Square, Leicester LE1 5EW. (0533) 539753. 6 days 9.30-5.30. A&R Cambridge, Heybrook, Marantz, Mission, Musical Fidelity, Nakamichi, QED Hi-Fi, Quad, Revox, Roksan "and oodles more". Largest selection in Leicestershire. 2 dem rooms. Home trial arranged + free installation. Credit facilities. Hi-Fi Markets, Access, Visa, Am. Exp. Service dept.

## LINCOLNSHIRE

**BOSTON HI-FI CENTRE**, 65a Wide Bargate, John Adams Way, Boston, Lincs PE21 6SG. (0205) 65477. Quad, Nakamichi, Creek, Ariston, NAD, Denon, Marantz, Castle, JPW, B&W. Separate demo studio. Home trial, free installation, service department. Access, Visa, Hi-Fi Markets Chargecard. Tues-Sat 9-5.30 pm.

## LONDON

**A.T. LABS**, 190 West End Lane, London NW6 (01) 794 7848. Mon-Sat 10-6. Two dem rooms. Access/Visa. Sony Hi-Fi News Best Dealer '86 & '88 (National). BADA MEMBER **3A2A**

**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 **3A2A**

**CORNFLAKE SHOP**, 37 Windmill Street (just off Tottenham Court Road), London W1 (01) 631 0472. Mon-Sat 10-7. DNM, Epos, Koetsu, Marantz, Naim, PS Audio, Rega, Roksan, SME, Yamaha. 2 dem rooms, full delivery and installation. Credit facilities. Access, Visa.

**COVENT GARDEN RECORDS**, 84 Charing Cross Road. (01) 379 7635/7427. Quad, B&W, Meridian, Mission, Yamaha, Sony, A&R Cambridge, Nakamichi, Rotel, etc. Dem facilities - no appointment reqd. Mon-Sat 10-7.30. Home trial facilities, free installation. Access, Visa, American Express, Diners Club. Service dept. BADA MEMBER **3A2A**

**DIN**, 25 Melcombe Street, London NW1 6AG. Tel: (01) 224 4413. Roksan, Quad, Denon, Meridian, Mission, Celestion, Krell, Apogee, Arcam, Nakamichi. Full demonstration and delivery. Free installation. Access, Visa, Amex, Diners.

**DOUG BRADY HI-FI**, 14-18 Monmouth St, London WC2H 9HB. (01) 379 4010. Wide range of top specialist hi-fi from Britain, America and Japan. 3 Dem rooms. BADA MEMBER **3A2A**

**GRAHAMS HI-FI**, Canonbury Yard, 190a New North Rd, London N1 7BS. (01) 226 5500. 'FBA Dealer of the year 1985'. Linn, Naim, Rega etc. £300-£3,000-£13,000. BADA MEMBER **3A2A**

**HI-FI CONFIDENTIAL**, 35/37 Marsham St., London SW1. (01) 233 0774. Open Mon-Fri 10-6, Sat 10-3. Creek, Denon, Hafler, Kelvin Lab, Musical Fidelity, Oracle, Quad, Rotel, S.D. Acoustic, S.M.E. etc. Large single speaker dem room. Limited home trial facilities. Export worldwide.

**H.L. SMITH & Co Ltd**, 287-289 Edgware Rd, London W2 1BE. (01) 723 5891. Aiwa, B&W, Denon, Dual, KEF, Ortofon, Panasonic, Sony, Technics, Yamaha. Dem facilities. Mon-Sat 9-5.30, Thurs 9-1. Credit to £1,000. Access, Visa, Diners. Service dept.

**KAMLA ELECTRONICS**, 251 Tottenham Court Road, London W1 (01) 323 274. Amadens, Ariston, BLQ, Gale, Incatech, JPW, Linx, Mordaunt Short, SME, Systemdek, Thorens, Townshend, Ruark, Wharfedale.

**KJ WEST ONE**, 26 New Cavendish St, London W1M 7LH. (01) 486 8262/63. Fax (01) 487 3452. Arcam, Audio Research, Croft, Epos, Linn, Marantz, Musical Fidelity, Quad, Systemdek, Voyd. 2 dem. studios. Appts. nec. Home trial. Free installation. Service dept. Major credit cards. Mon-Sat 10-6pm. (Late night Thursday til 7pm.)

**NICHOLLS HI-FI**, 430-434 Lee High Street, Lewisham, London SE12 8RW. (01) 852 5780. Sony, Technics, Harman, JBL, Mordaunt Short, Kenwood, Panasonic, Hafler, Sumo, B&W. Dem facilities. Home trial. Free installation. Service dept. Credit available. Visa, Access. 9.30-6 Mon-Sat, Thurs till 1 o'clock.

**RICHER SOUNDS 2**, 6 London Bridge Walk, London SE1. (01) 403 1988. Major names in esoteric hi-fi, unusually matched to discount offers and special end-of-line purchases. Dem facilities, expert advice, free local delivery & installation (\$500+), plus 2 Yr G'tee. Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-7, Sat 10-5. Access, Visa, Richer ChargeCard. Service Department.

**RICHER SOUNDS 2** London Bridge Walk, London SE1 2SX. (01) 403 1201/4710. The original bargain hi-fi store, now refitted; 100s of regular and special discounts on most budget/mid price major names. By London Bridge. Facilities: expert advice; free 48 page Hi-Fi Guide and

monthly Newsletters; mail order; part exchange. Open Mon-Fri 10-7, Sat 10-5. Access, Visa, Richer ChargeCard. Service Department.

## MIDDLESEX

**A.T. LABS**, 173-175 Station Rd, Edgware, Middx. (01) 952 5535. Mon-Sat 10-6. 2 dem rooms. Access, Visa. Sony/Hi-Fi News Best Dealer '86 & '88 (National). BADA MEMBER **3A2A**

**UXBRIDGE AUDIO LTD**, 278 High St, Uxbridge, Middx UB8 1LZ. (0895) 30404 (Multi-line). A&R, AR, Ariston, Creek, Cyrus, Denon, Dual, JPW, KEF, Manticore, Meridian, NAD, Nakamichi, Quad, Rotel, Wharfedale, Yamaha, etc. 2 dem rooms. Mon-Sat 10-6. BADA MEMBER **3A2A**

**HARROW AUDIO**, 27 Springfield Rd, Harrow. (01) 863 0938. Mon-Sat 9.30-5.30. A&R, Audiolab, Cyrus, Denon, Dual, Heybrook, Linn, Monitor Audio, Musical Fidelity, Quad, Rotel, Tannoy etc. BADA MEMBER **3A2A**  
**A.T. LABS**, 159 Chase Side, Enfield, Middx (01) 367 3132. Mon-Sat 10-6. Two dem rooms. Car Park Access/Visa. Sony/Hi-Fi News Best Dealer '86 & '88. BADA MEMBER **3A2A**

## MERSEYSIDE

**IN CONCERT HI-FI**, 144 Seaview Road, Wallasey, Wirral, Merseyside. (051) 630 5055. Denon, Kenwood, QED, Alexander, Spica, Shan Acoustics, Monitor Audio, Tannoy, Audio Dynamics, Dual, Systemdek, Ortofon, Audio Technica, Target, Musical Fidelity, Alphason. Single speaker dem room. Home trial + free installation. 10-6 - closed Mon. Open till 8pm Thurs and Fri.

**W.A. BRADY & SON**, 401 Smithdown Rd, Liverpool L15 3JJ. (051) 733 6859. 'Largest choice of specialist Hi-Fi in N.W. £100-£20K'. All credit cards. 3 dem rooms. Closed Monday. BADA MEMBER **3A2A**

**PURE SOUND - Birkenhead** 051 645 6690 24hrs. Acoustic Energy, Aragon, Audio Technica, Beard, Celestion, Deltac, Denon, Michel, Cyrodec, Ortofon. Home demonstration a pleasure, plus evenings and weekends (Sundays by appointment).

**RICHER SOUNDS**, 69B Church St, Liverpool L1 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

**BASICALLY SOUND**, The Old School, School Rd, Bracon Ash, Norwich NR14 8HE. (0508) 70829. Arcam, Linn, Naim, Denon, Spendor, Heybrook, Audio Technica, Creek, Rega, Epos, etc. 2 comprehensive dem rooms. Home trial. Free installation. Visa, Access. HP facilities. Tues-Sat 9.30-1. 2-5.30.

**SOUND APPROACH**, 161 Unithank Road, Norwich. (0603) 622833. Kuzma, Ariston, Castle, Denon, Exposure, Ion, Royd, NVA, Roksan, Ruark, etc. etc. Dem and home trial facilities. Mon-Sat 9-6.30. Free installation. Credit to £1,500. Visa, Access, Diners Club. Service dept.

## NORTHAMPTONSHIRE

**CLASSIC HI-FI + VIDEO**, School Lane, Kettering, Northants. (0536) 515766. ADC, Marantz, Onkyo, Sansui, Teac, Harman Kardon, Pioneer, Proton, Ariston, Thorens, Mantra, Goodmans, Castle, JPL, Mordaunt Short, Seleco TV, Monitor Cable + others.

**THE AUDIO SHOP**, Coffee Tavern Court, High St, Rushden. (0933) 56651. Audio Technica, Denons, Goodmans, Rotel, Tannoy, Ion Systems, Thorens, Gale, BLQ, Royd. Dem room. Home trial and free installation. Mon-Sat 9.30-5.30 (Thurs 9.30-2). Service dept.

**SOUND PRINCIPLES**, 52 Queen Street, Wellingborough, Northants. (0933) 441907. Ariston, Celestion, Heybrook, Marantz, Mission, Nakamichi, QED, Rotel, Spendor, Yamaha and others. One demo room 22' by 11', well furnished. Home demo's by appt. Appts necessary. Free installation. Access, Visa + credit scheme available. Mon-Fri 10-6, Sat 9-5. Out of hour appts can be made.

## NOTTINGHAMSHIRE

**DEFINITIVE AUDIO**, Nottingham. (0602) 813562. Voyd, Valdi, Systemdek, Helius, Audionote, Golding, JPW, Snell, Target, Pirate. Home demonstrations throughout Nottingham and East Midlands. Please telephone (0602) 813562 for further information.

**CHANTRY AUDIO**, Chantry Walk, 18a Eldon Street, Tuxford, Newark, Notts NG22 0LH. (0777) 870372. Ariston, ADC, Gale, Infinity, JPW, Kelvin Labs, Proton, Rotel, Space Acoustics, Thorens. Single speaker dem room. Appts preferred. Home trial, free installation. Access, Visa + credit facilities. Mon-Fri 10am-4pm. Sat 9-30-5.30. Sun home dem by appt. Closed Weds.

## WEST MIDLANDS

**ALTERNATIVE AUDIO Ltd**, 93-95 Hobs Moat Rd, Solihull. (021) 742 0254 (sales), 0248 (service). The widest range of quality hi-fi and CD in the West Midlands. Tues-Sat 10-6. BADA MEMBER **3A2A**

**GRIFFIN AUDIO Ltd**, 94 Bristol St, Birmingham. (021) 692 1359. Linn, Naim Audio, Rega, Creek, Denon, Nakamichi, Quad, Mission, Monitor Audio, Rotel. BADA MEMBER **3A2A**

**FRANK HARVEY HI-FI EXCELLENCE**, 163 Medieval Spon St, Coventry. (0203) 525200. Linn, Musical Fidelity, Quad, Mission, Cyrus, Denon, A&R Cambridge, Rotel, Nad, Nakamichi etc. Three floors of carefully selected hi-fi amidst the eloquence of our 14th century showroom. Dem, home trial and credit facilities. Access, Visa, Diners, Am. Exp. Mon-Sat 9.30-5.30. Closed Thurs. BADA MEMBER **3A2A**

**GRIFFIN AUDIO LTD**, 94 Bristol Street, Birmingham. (021) 692 1359/(021) 622 2230. Castle, Creek, Cyrus, Denon, Linn, Marantz, Naim, Quad, Rega, Rotel. Tues-Sat 10-6. BADA MEMBER

**HORTON ELECTRONICS (1987) LTD**, 8-9 Lower Temple St, Birmingham B2 4JD. (021) 643 0972. Aiwa, Dual, Marantz, Goodmans, JVC, Mission, Sony, Technics, Wharfedale, Sennheisser. Dem facilities. Credit to £1000. Access, Visa. 9-5.30 Mon-Sat. Service dept.

**RICHER SOUNDS 2**, 12 Smallbrook Queensway, Birmingham B5 4EN. (021) 643 6664. Popular esoteric hi-fi for upgrades, monthly special offers. Dem facilities, expert advice, free local delivery/installation (\$500+), 2 Yr G'tee. Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard. Service Dept.

**RICHER SOUNDS**, 10 Smallbrook Queensway, Birmingham B5 4EN. (021) 643 1516. An A-Z of affordable, popular hi-fi; no-frills environment. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard. Service Dept.

**FIVEWAYS HI-FIDELITY LTD**, 12 Islington Row, Edgbaston, Birmingham. (021) 4550667. Alphason, A&R, Denon, Meridian, Musical Fidelity, Nakamichi, Quad, Revox, TDL, Thorens, etc. Dem and home trial facilities. Tues-Sat 9.30-6. Free installation. Access, Visa. Service Dept.

**BRIDGE HI-FI**, 3 Tudor House, Bridge St, Walsall (0922) 640456. NAD, Dual, Yamaha, Kenwood, Technics, Pioneer, Mission, Celestion, Denon, Mordaunt Short. Appts required. Home trial and free installations. Access, Visa, Diners, Amex. Credit to £1,000. 9.15-5.30 Mon-Sat. Service dept.

## OXFORDSHIRE

**ABSOLUTE SOUND AND VIDEO**, 19 Old High St, Headington, Oxford. (0256) 24311. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER **3A2A**

**ASTLEY AUDIO LTD**, 3 Market Place, Wallingford. (0491) 39305/34349. AR, Dual, Kenwood, Mordaunt-Short, Mission, Monitor Audio, Philips, Technics, Tannoy, Yamaha. Tues-Fri 9-5.30, Sat 9-5. Records, tapes, 1000+ CD's. Service Dept. Access, Visa, Diners.

**WESTWOOD AND MASON**, 46 George St, Oxford. (0865) 247783. Linn, Naim, Rega, A&R, Heybrook, Dual, Mordaunt-Short, Mission, Tannoy, Quad, etc. BADA MEMBER **3A2A**

**WITNEY AUDIO & VIDEO**, 28 High St, Witney, Oxford. (0993) 2414. A&R, Aiwa, Akai, Bose, Denon, Dual, Goldstar, JBL, Mordaunt-Short. Dem facilities. Mon-Sat 9-5.30. Free installation, credit to £1,000. Access, Visa. Service dept.

**OXFORD AUDIO CONSULTANTS LTD**, Cantay Hse, Park End Place, Oxford OX1 1JE. (0865) 790879. Oxford Acoustics, Audio Research, Krell, Magneplanar, Apogee, Aragon, Slax, Marantz, Wharfedale, Cambridge Audio. Home trial and free installation. Instant Credit. Access, Amex, Visa. 10-6 Tues Sat. Service dept.

**HORNS OF OXFORD LTD**, 6 South Parade, Summertown, Oxford. (0865) 511241. Alphason, Ariston, B&W, Celestion, Marantz, Nakamichi, Pink Triangle, Quad, Sony, Technics. Free installation. Service dept. Access, Visa. 9-5.30. Closed Thurs. BADA MEMBER **3A2A**

## SHROPSHIRE

**AVON HI-FI Ltd**, 12 Barker St, Shrewsbury. (0743) 55166. A&R, B&W, JBL, NAD, Nakamichi, Revolver, Trio, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9-5.30, closed Thur. Free installation, credit to £1,000. Access, Visa. Service dept.

**MID SHROPSHIRE AUDIO**, 2 Holland Court, High Street, Dawley, Telford, Shropshire. (0952) 630172. Cambridge Audio, Marantz, Onkyo, Rubric, Tannoy, Alexander.

# SELECTED DEALER DIRECTORY

Appolo, Ion Systems, Audio Innovations, SD Acoustics. 2 dem lounge. Home trial. Free installation. Service dept. Access, Visa. Credit facilities available. Instant credit subject to status. Mon-Sat 10-5 evenings/Sunday by special arrangement.

CREATIVE AUDIO, 9 Dogpole, Shrewsbury. (0743) 241924. Marantz, Meridian, Linn, Naim, A&R, Mission, Nakamichi, Revolver, Castle, Audio Technica. Dem room. Home trial and free installation. Credit to £1000. Access, Visa. Tues-Sat 9.30-5.30. Service dept.

## SOMERSET

WATTS RADIO - THE ENGINEERS, Jim Badman, 1 West Street, Somerton. (0458) 72440. Castle, Dual, Denon, KEF, Mordaunt-Short, Ortofon, Quad, Rogers, Thorens, Yamaha. Dem and home trial facilities. Mon-Sat 9-1, 2-5.30, Wed 9-1. Free installation. Credit to £1,000. Access, Visa. Service dept.

## STAFFORDSHIRE

GRANGE HI-FI LTD, 153 Branson Road, Burton-on-Trent DE14 3DQ. (0283) 33655. Audio Innovations, Arcam, Creek, Systemdek, Snell, Spondor, Cambridge, Pink Triangle, Quad, Voyd, etc. 2 dem rooms. Mon, Tues, Thurs, Fri, Sat. 9-6. Closed Wed. Free installation. Credit facilities. Visa. Access. Service dept.

ACTIVE AUDIO, 29 Market Street, Tamworth, Staffordshire. (0827) 53355. Arcam, Ariston, Celestion, Denon, Heybrook, Kef, Cyrus, Musical Fidelity, Marantz, Revox, Rotel, Rogers, etc. etc. Demonstration and home trial facilities. Account and credit cards. Ring for opening times and free 'Fact Pack'. BADA MEMBER 3424

MUSICAL APPROACH, 137A Newport Road, Stafford (above Royal London Insurance). (0785) 55154. Linn Products, Arcam, Creek, NVA, Revolver, Audiotec, Onix, Epos, Marantz, Rotel and more. Home trial. Free installation. Service dept. Credit facilities available. Access, Visa. 9.30-5.30 Mon-Sat.

## SUFFOLK

EASTERN AUDIO 41 Bramford Rd Ipswich. (0473) 217217. Quad Audio Lab Denon Dual Marantz Mission NAD Nakamichi Technics Arcam. Mon-Sat 9.30-6. BADA MEMBER 3424

## SURREY

AERCO AUDIO Ltd, 11 The Broadway, Woking, Surrey GU21 5AP. (04862) 4667. Roksan, Exposure, Ion, Systemdek, Royd, Marantz, AR, Rotel, HK, Nakamichi, Oracle, Infinity, etc. BADA MEMBER 3424

PJ HI-FI Ltd - The Hi-Fi Shop, 3 Bridge Street, Guildford, Surrey GU1 4RY. Tel: (0483) 504801. 9-6 Mon-Sat. Linn, Creek, Arcam, Quad, Revox, Musical Fidelity, Rotel, NAD, Nakamichi, Marantz BADA MEMBER 3424

ROGERS HI-FI, 13 Bridge Street, Guildford (0483) 61049. Ariston, Acoustic Research, Akai, Denon, JPW, Mordaunt-Short, Marantz, Onkyo, QED, Tannoy etc. Mon-Sat 9.30-6. Dem. facilities. Instant Credit. Access, Visa. Service dept.

SURBITON PARK RADIO, 48 Surbiton Rd, Kingston-Upon-Thames, Surrey. (01) 546 5549. Quad, Dual, Denon, Kenwood, Nakamichi, Rotel, Pioneer, QED, B&W, Tannoy. Dem and home trial facilities. Access, Visa. 9.30-5.00 Tues-Sat. Service dept.

TRU-FI SOUND AND VISION, 2 Central Parade, Redhill, Surrey. (0737) 767400/766128. Akai, Aiwa, B&W, Nakamichi, JPW, Mission, Mordaunt Short, Nagaoka, Sony, Technics. Dem. facilities. Mon-Sat 9.30-6. Free installation, credit to £1,200. Access, Visa. Service dept.

UNILET PRODUCTS Ltd, 35 High St, New Malden, Surrey KT3 4BY. (01) 942 9567. Mon-Sat 9-6. Thurs 9-7. Dem facilities. Large stock. Amex, Access, Diners, Visa. SPALDINGS HI-FI, 352-4 Lower Addiscombe Rd, Croydon, Surrey. (01) 654 1231. 3 dem rooms + home dem. Free installation, credit. Mon-Sat 9-6, Tues to 8. Closed Wed. Service dept. BADA MEMBER 3424

TRU-FI SOUND & VISION, 10 Church St, Leatherhead, Surrey. (0372) 378780. Sony, Technics, Panasonic, Mitsubishi, Ferguson, Aiwa, Pioneer, Sanyo, B&W, Mission. Free installation. Credit facilities. Access, Visa. 9.15-5.30 Mon-Sat. Closed Wed. Service dept.

## SUSSEX (EAST)

DEFINITIVE AUDIO BRIGHTON, 8 Dyke Road Mews, 74-76 Dyke Road, Brighton BN1 3JD. (0273) 208649. Voyd, Systemdek, Audio Innovations, Helius, Audionote, JPW, Snell, Pirate Stands, Goldring etc. Home dems throughout Sussex. Credit facilities. Visa.

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 3424

JEFFRIES HI-FI, 4 Albert Parade, Green St, Eastbourne,

East Sussex. (0232) 31336. 2 dem rooms, closed Mon. Late night Wed. Parking, bus route. Credit facilities.

BADA MEMBER 3424  
HASTINGS HI-FI, 31-32 Western Rd, St Leonards On Sea. (0424) 442975. A&R, B&W, Mission/Cyrus, NAD, Nakamichi, Quad, Rotel, Systemdek, Tannoy, Yamaha. 2 dem rooms. Mon-Sat 9-6. Home trial facilities. Free installation. Credit facilities. Access, Amex, Visa. Service dept.

## SUSSEX (WEST)

BOWERS AND WILKINS Ltd, 1 Becket Buildings, Littlehampton Rd, Worthing (0903) 64141. B&W, Cambridge, Dual, JVC, Mordaunt-Short, Nakamichi, Philips, Shure, Quad, Sony. 2 dem rooms. Mon-Sat 9-5.30, Weds 9-1. Home trial facilities, free installation, credit to £1,000. Access, Visa. Service dept.

CHICHESTER HI-FI, 7 St Pancras, Chichester, W. Sussex PO19 1SJ. Tel: (0243) 776402. Linn, Naim, Rega, Creek, Nakamichi, A&R, Denon, Roksan etc. Tues-Sat, 10-1, 2-5 15 (closed Mon). BADA MEMBER 3424

## TYNE & WEAR

RED RADIO SHOP AND HI-FI CENTRE, 11 Olive St, (Off Park Lane) Sunderland. (Sunderland) 5672087. Bose, Castle, Denon, JVC (Hi-Fi and Portable TV), Luxman, Michell, Mordaunt-Short, Pickering, Tannoy. Dem facilities. Mon-Sat 9-5.30. Free installation, interest free credit. Visa. Service dept.

## WARWICKSHIRE

AUTHENTIC AUDIO, 25 Henley Street, Stratford-upon-Avon, Warwickshire CV37 6QW. (0789) 414533. Linn, Quad, M.F., Denon, NAD, etc. Dem room. Home trials. Part-ex. Service dept. Mon-Sat 9.30-5.30.

## WILTSHIRE

ABSOLUTE SOUND AND VIDEO, 60 Fleet Street, Swindon (0793) 538222. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER 3424

## YORKSHIRE (NORTH)

ELITE HI-FI, 178 Kings Road, Harrogate HG1 5JG (0423) 521 831. Voyd, Valdi, Avalon, Systemdek, Helius, Audionote, Goldring, Audio Innovations, Sugden, Marantz. Mon-Sat 9-5.30. Free installation. Service dept. SCARBOROUGH HI-FI CENTRE, 53 Dean Road, Scarborough YO12 7SN. (0723) 974547. A&R, Bose, QED, Denon, NAD (incl. Monitor series), Thorens, Onkyo, Tannoy, Marantz, Ruark. Dem Room. Appts preferred. Home trial facilities. Mail order and part exchange. Visa, Access, Diners, Hi-Fi Markets Chargecard facilities. Open 10-6 Mon-Sat.

RICHER SOUNDS, 6 Peasegate, York YO1 2SQ. (0904) 645535. Probably the smallest hi-fi store in York; but stocks the A-Z of popular budget hi-fi at special discount prices. Facilities: expert advice, free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

## YORKSHIRE (WEST)

AUDIO PROJECTS, 45 Healdingley 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 3424

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 3424

HUDDERSFIELD HI-FI CENTRE, 4 Cross Church St, Huddersfield. (0484) 544668. B&W, Kenwood, Denon, Dual, A&R Cambridge, Musical Fidelity, Quad, NVA, Audio Lab, Philips, Mission, etc. Dem facilities - appointment reqd. Mon-Sat 9-5.30, Thurs 9-8. Closed Wed. Free installation, credit facilities. Access, Visa.

IMAGE HI-FI Ltd, 8-10 St Annes Rd, Healdingley, Leeds. (0532) 789374. AR, Audio Lab, Denon, Linn, Marantz, Meridian, Mission, Monitor Audio, NAD, Quad. BADA MEMBER 3424

RICHER SOUNDS, 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 10-5. Access, Visa, Richer ChargeCard.

SELECTIVE AUDIO, The Forge Cottage, 19 Crossgate, Otley. (0943) 467689. Exclusively handles Alphonson, Roksan, NVA, ProAc, TDL, JDI, in the area and other minimalist British designer products for the discerning listener. Dem facility. Member of the Cognoscenti. Mon-Sat 10-6.

## IRELAND

CEOL PRODUCTS, 185 Lower Rathmines Road, Dublin 6. Tel: 0001 975984 961358. Alphonson, Audio Innovation, Exposure, Linn, Marantz, Monitor Audio, Mordaunt Short, Musical Fidelity, Rega, Roksan. Single Speaker listening rooms. Free installation. All major cards. Mon-Sat 9.30-6.00.

CLONEY AUDIO, 55 Main St, Blackrock, Dublin. 0001 889449/888477. Arcam, Acoustic Energy, Apogee, Linn, Naim, Creek, Rega, Rogers, Sony, Nakamichi. 2 single speaker dem rooms. Home trial. Free installation. Service dept. All major credit cards. Interest free credit. Tues-Sat 10-6, Thurs and Fri till 9pm.

## SCOTLAND

### EDINBURGH

RICHER SOUNDS, 1B Chambers St, Edinburgh EH1 1HR. (031) 226 3544. Discount hi-fi near the Royal Scottish Museum; affordable culture with monthly special offers on major names. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

BILL HUTCHINSON Ltd, 43 Clarke St, Edinburgh. (031) 667 2877. AR, Aiwa, Denon, Dual, JVC, Mission, Mordaunt-Short, Omar, Technics, Yamaha. Dem facilities. Mon-Sat 10-6. Free installation. Instant credit. Credit cards: Access, Visa. Service dept.

### GLASGOW

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) 248 4079. Linn, Naim, Rega, Arcam, Creek, Epos, Exposure, Revox, PT, etc. Mon-Sat 10-6. Interest free credit. BADA MEMBER 3424

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.

### 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 3424

## WALES

### CUMBRIA

LAKELAND HOME MUSIC, "Fair Place" (200yds past church), Water millock, Penrith. Call OLR 07684 86235. Hear the full Quad range and ATC SCM 50A monitors here (B&B available), or in your own home, without obligation, in N. England and Scotland. Castle, Spondor, Sugden, Marantz, Townshend, Kelvin Labs, Primare, Sumo and compact discs available.

### GLAMORGAN

AUDIO EXCELLENCE, 134 Crwys Road, Cardiff. (0222) 28565. Audio Research, Dual, Krell, Linn, Magneplanar, Naim, NAD, Yamaha, etc. Closed Mon.

BADA MEMBER 3424  
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.

### NORTH WALES

ELECTRO TRADER, 19 Colwyn Crescent, Rhos On Sea, Colwyn Bay, Clwyd. (0492) 48932. Ariston, Arcam, B&W, Heco, Infinity, Onkyo, Rotel, Tannoy, TDL, Yamaha etc. Dem room. Appts preferred. Home trial. Free installation. Access, Visa, American Express, Diners. 9.30-1.00, 2.00-5.30 Mon-Sat.

# DEALER GUIDE



**THE HI-FI SPECIALIST**  
Single Speaker Dem Room  
*Appointed Stockists for:-*  
Akai · Aiwa · Ariston · B&W

Denon · Dual · Exposure · Heybrook · Incatech · JVC · JBL  
Kenwood · Marantz · Nakamichi · Philips · Revox  
Sony ES · Technics · Townshend · Systemdek · Yamaha  
plus accessories

**H. L. SMITH & Co. Ltd.,**

287-289 Edgware Road, London W2 1BE  
Telephone: 01-723 5891/7595 Fax: 01-724 6101  
Access, Visa, Amex, Diners, Credit Charge

A & R, Creek, **B&W**, Nakamichi, Heybrook,  
Dual, Linn, Meridian, Quad, Cambridge  
**Audio, Denon, Musical Fidelity,**  
and many other leading brands.



SINGLE SPEAKER DEM. LOUNGE.  
ENTHUSIASTIC DEMONSTRATION WITH PLEASURE.

## NICK DAKIN

(HI-FI SPECIALISTS) LTD.  
45 Radford Road, Nottingham.  
Telephone (0602)783862



STOCKISTS OF JVC,  
ARISTON, CASTLE,  
STUDIO POWER SPEAKERS



*PP Sounds*

5 KING STREET,  
MELKSHAM, WILTSHIRE  
TELEPHONE: 0225 708045

58 CASTLE STREET,  
TROWBRIDGE, WILTSHIRE  
TELEPHONE: 0225 777799

**AKAI**



**DENON**

## 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

## SHROPSHIRE HI-FI

**THE HI-FI SPECIALIST**

ARISTON, AUDIO TECHNICA, CAMBRIDGE AUDIO, CELEF,  
DENON, DUAL, HEYBROOK, INFINITY, ION, MANTRA,  
MORDAUNT SHORT, MUSICAL FIDELITY, MONITOR AUDIO,  
MARANTZ, NVA, PROAC, QED, ROTEL, TARGET, TEAC, ETC.  
TANNOY, ROKSAN, TOWNSHEND

Demonstration Room, Free Parking, Free Installation, Repairs

CLOSED THURSDAY

**SHROPSHIRE HI-FI, ST. MICHAEL'S STREET,  
SHREWSBURY 0743 232065**

SMC GROUP



FAR'S SKENE  
SQUARE?

**3/5 SKENE SQUARE (0224) 624408**

## AUDIO VENUE

24 CHURCH ROAD, CRYSTAL PALACE, LONDON SE19 2ET  
TEL: 01-771 7787

Stockists of: Linn Hi-Fi, Naim Audio, Epos, Creek, Denon, Dual,  
Revolver, Marantz, BLQ, Yamaha, Nakamichi, Rotel, Audiotec, etc.

2 single speaker demonstration rooms, Instant Credit Facilities.

All equipment delivered & installed. Comprehensive turntable rebuilds etc.

Low Rate Credit. 2 year warranty.



Open 10-6pm – Closed all day Wednesday




**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

**7 St. Pancras, Chichester**  
Telephone 0243 776402  
(Closed all day Monday)

# DEALER GUIDE

**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-Creek-Allison and Philips.  
"Demonstration Facilities" "Part Exchange Welcome"  
"Free Delivery & Installation" Access & Visa accepted  
"Cumbria's Premiere Hi-Fi Centre"

**MS MONITOR SOUND** *Hi-Fi Specialists*

■ A&R	■ B&W
■ Castle	■ Denon
■ Dual	■ Marantz
■ Mordaunt-Short	■ Monitor Audio
■ Musical Fidelity	■ 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

**NAD** **ROTEL** **B&W** **DENON** **Dual**

**Norman H. Field** *Hi-Fi*

*Technics* **ALBANY HOUSE,**  
**HURST STREET,**  
**BIRMINGHAM B5 4BJ**  
Telephone: 021-622 2323

**HI-FI MARKETS**  
The place where people care about hi-fi

**YAMAHA**

**BUY, SELL, EXCHANGE & REPAIR CENTRE FOR TV, VIDEO & HI-FI**

- ★ NEW & RECONDITIONED EQUIPMENT
- ★ FULLY GUARANTEED
- ★ COMPETITIVE PRICES
- ★ TECHNICAL ADVICE GIVEN
- ★ EXPORT ORDERS WELCOME
- ★ FULL BACK UP AND REPAIR SERVICE
- ★ FOR PERSONAL & PROFESSIONAL SERVICE




**CANAL BRIDGE AUDIO VISUAL**  
**172 Caledonian Road, London N1 0SG**  
**01-837-8741**

AMERICAN EXPRESS MA VISA CD

**Audio Image**

*Audio Image*  
15 Middle Row,  
Stevenage,  
Hertfordshire,  
SG1 3AW  
Tel: (0438) 360606

**CONSUMER AUDIO & VISUAL CONSULTANTS**



**MANDERS HI-FI LTD**

For Nakamichi, Quad, Dual, Hafler, Luxman, Denon, Revox, Harman-Kardon, A+R, Thorens, QED, Spondor, Monitor Audio, Rotel, Ariston, Revolver, Technics, Musical Fidelity, Wharfedale, Celestion, Proton, A.E. Speakers etc.

*Two year guarantee on hi-fi*

**2 Edward St, Grimsby, Humberside**  
**0472-351391**

**BEST BUY** **NAKAMICHI**  
A NEW EXPERIENCE IN SOUND

Hear the Nakamichi CA7E + PA7E + OMS CD + Bose 901 Speakers and Nakamichi CA-5E + PA-5E + OMS CD + TDL Speakers to Choice

- Demonstrations Anytime (Wed. & Sun. by appointment only) •  
• Special Prices Available •
- Also Quad • Revox • Sony E.S. • Technics • Tannoy • Mordaunt-Short • JBL
- Part Exchange your old equipment • Personal Attention

**the hi-fi centre**  
GREEN LANE • WILMSLOW • CHES • SK9 1LW  
Telephone 0625 524766. Closed Wed.

**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, NAD, MANTICORE, MARANTZ, ROKSAN, AUDIOLAB, CELESTION, HEYBROOK, ARCAM, SYSTEMDEK, DENON, TDL, KEF, & Many more.*

- OPEN TUES-SAT 9.00-6.00
- FULL DEMONSTRATIONS - IN STORE & IN HOME



## 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

*In Concert* **W&A**

## Quality HiFi on the Wirral

A wide range of products from the leading manufacturers including:

Musical Fidelity, Monitor Audio, Alexander Acoustics, KEF, Tannoy, Denon, Kenwood, Audio Dynamics, QED, Shan Acoustics, Spica, Dual, Systemdek, Target Audio, Audio Dimensions, Nagaoka, Audio Technica, Ortofon .....and a wide range of accessories

**Demonstrations in our listening room or at home**

144 Seaview Road, Wallasey, Wirral, Merseyside L45 4PE - Tel 051 630 5055  
Opening times: Tuesday/Wednesday/Saturday 10.00-6.00, Thursday/Friday 10.00-8.00  
Lunch 12.30-1.30, Closed all day Monday

# aston audio

HI-FI SPECIALISTS

### STOP PRESS

CELESTION MUSICAL EVENING ON THURSDAY 30TH NOVEMBER 1989 SHOWING THE 3000 5000 & 7000 FREE TICKETS AVAILABLE NOW

MARANTZ SPENDOR KEF  
AUDIO-TECHNICA TANNOY  
QUAD MUSICAL FIDELITY  
REVOLVER YAMAHA STAX  
MORDAUNT-SHORT SME  
DENON CELESTION  
MONITOR AUDIO ROGERS  
B & W NAKAMICHI CELLO  
MERIDIAN AUDIOLAB  
AMADEUS ZARATHUSTRA  
CAMBRIDGE AUDIO ROTEL

4 WEST STREET  
ALDERLEY EDGE  
CHESHIRE

☎ 0625 582704

Closed Monday



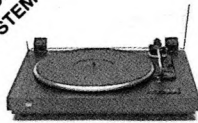
DISCOUNT CD & TAPE  
EXTENDED GUARANTEE  
INTEREST FREE CREDIT

# BILLY VEE SOUND SYSTEMS

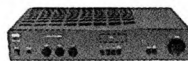
THE S.E. LONDON PURE HI-FI SPECIALISTS

**SUPER SYSTEM SAVER (SEND FOR OUR CATALOGUE)**

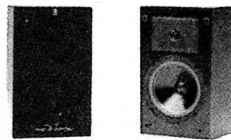
**COMPATIBILITY + PERFORMANCE + VALUE =**



The CS 430, a new budget winner from Dual.  
On its own £90.00



20 watt of NAD 3020 undiluted power  
On its own £129



The A.R. Red Box, a new rising star.  
On their own £90.00

SAVE OVER £50  
on this super system

**£269.00**

**FREE! MAIL ORDER  
FREE SYSTEM GUIDE**

Inc. no cost, no hassle  
upgrades

**FREE! 10 METRES OF Q.E.D. SPEAKER LEAD**

**UP TO £1000 INTEREST FREE CREDIT AVAILABLE!**  
TO PERSONAL CALLERS PLEASE RING OR WRITE FOR DETAILS

### A&R, CAMBS

If you are interested in CD, what do you think of the new Alpha? We think its rather good. We have it on dem along with the new much improved Delta 90/2 amplifier. If you are interested come and listen. Our interest as ever is free over 6, 9 or 12 months.

### MARANTZ

How do you get the best from your CD 85? First you have a dem, then if you buy one we will advise you and give you a rather special set of

interconnects and a CD cleaner free of charge to keep your discs perfect. Here are some digits to get you started. (01) 318 5755.

### N.A.D.

How does the new NAD 6325 cassette deck get the best from any tape? The answer is a trim control - come and have a dem, it's a steal at only £159 (top left). Is the new 5320 CD that good for only £169? Gramophone think so, come in and have a listen.

### WE OFFER YOU:-

- ★ INSTANT DEMONSTRATION OF OUR SYSTEMS WITH NO OBLIGATION, OR:
- ★ 2 DEMONSTRATION STUDIOS AVAILABLE BY APPOINTMENT!
- ★ 2 YEAR GUARANTEE ON OUR GOODS (SPECIAL PURCHASES EXCEPTED)
- ★ FAST 'N FREE MAIL ORDER ACROSS THE U.K. MAINLAND
- ★ PART EXCHANGE ON YOUR OLD HI-FI
- ★ FRIENDLY KNOWLEDGEABLE ADVICE
- ★ FREE LOCAL INSTALLATION SERVICE FOR SYSTEM BUYERS

**FAST 'N FREE MAIL ORDER SERVICE - RING (01) 318 5755**

**ALL THIS AND MORE AT:-**

**248 LEE HIGH ROAD, LEWISHAM, LONDON SE13**

Phone: (01) 318 5755 or (01) 852 1331 Mon - Sat 10.00 a.m. - 6.30 p.m. (closed Thursday)

AIWA  
A&R  
A.R.  
CREEK  
DENON  
EXPOSURE  
HEYBROOK  
J.P.W.  
K.E.F.  
LJNN  
MARANTZ  
NAIM  
NAD  
REGA  
ROTEL  
NAKAMICHI  
TANNOY

**£5.00  
OFF EVERY £100  
YOU SPEND ON  
PRODUCTION OF THIS AD.**

**FREE! HUNT EDA  
RECORD CLEANER WITH  
£7.95 WITH THIS SYSTEM**

# Audio Acoustics

RETAILERS FOR THE ULTIMATE IN FINE  
QUALITY AUDIO PRODUCTS

AUDIO ACOUSTICS are proud to announce we are the sole U.K. stockist for the unique "REFERENCE VOYD" turntable. It is on permanent demonstration and is the last word in accurate and neutral reproduction of music.

Hearing, is still not believing !!

But if you want the best and have heard the rest, we will let your ears decide!

THE VOYD - its not a reference but has proven to be a Musical Prodigy compared with all other turntables. Again, please don't take our word, come listen!

We also have the complete SNELL range of loudspeakers from TYPE K's ascending to the reference standard 'TYPE A'. These speakers have no match in terms of neutrality and musicality.

### STOP PRESS!

London's main audio innovation centre has the first /series 400 integrated amplifiers on demonstration.

12 watts of magic for only £575.

NEW - the performance level of budget pre/power has been raised by the introduction of the Series 200 combination - On Demonstration Now

AUDIOINNOVATIONS  
GOLDRING  
MICHELL  
SYSTEMDEK

AUDION  
HELIUS  
PIRATES  
VALDI  
SNELL

AUDIONOTE  
JPW  
RATA  
VOYD  
REVOX

Demonstration by appointment,

Tel: 01 -998 -9041

Mon-Sat 11am-9pm



AT LAST A WEST  
EALING DEALER

OPEN  
10AM - 6PM

FREE DELIVERY  
& INSTALLATION

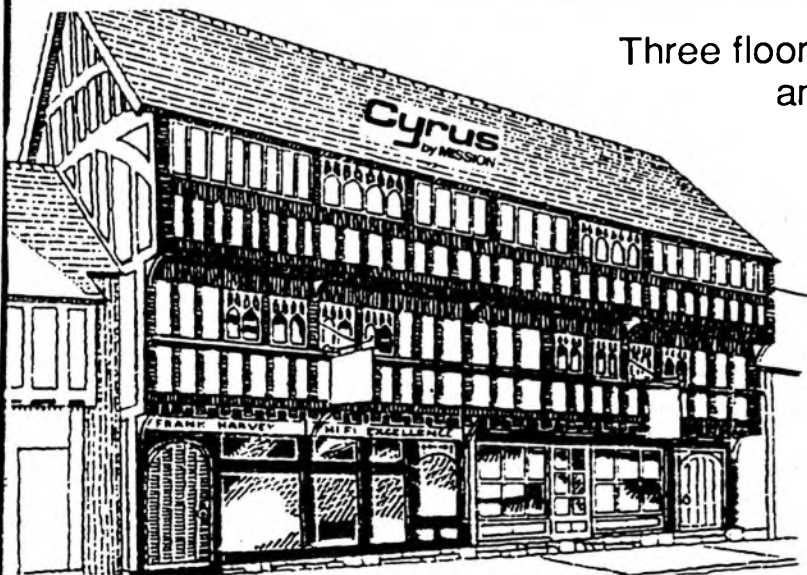
INTEREST  
FREE CREDIT

# PRO Musica

hi-fi specialists

6 VINEYARD STREET • COLCHESTER • ESSEX • TEL: 577519

## FRANK HARVEY HI-FI EXCELLENCE



Three floors of carefully selected hi-fi amidst the eloquence of our 14th century showroom.



3 FLOORS - 3 SINGLE SPEAKER DEMONSTRATION ROOMS  
3000 SQ FEET IN THE PURSUIT OF HI-FI EXCELLENCE.

BECAUSE PEOPLE LIKE MUSIC,  
**FRANK HARVEY**

HI-FI EXCELLENCE  
163 MEDIEVAL SPON STREET  
COVENTRY CV1 3BB

NICE  
STAFF

(0203) 525200



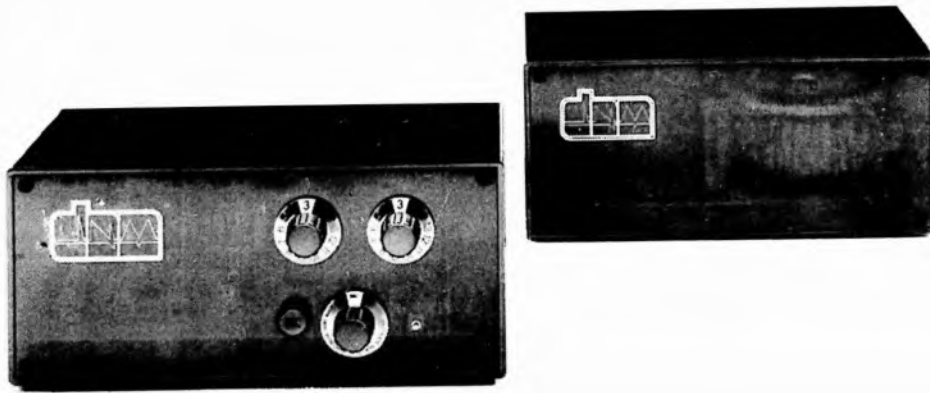
MUSICAL  
FIDELITY



NICE  
COFFEE

(0203) 525200

# D N M



Transparent in sight

Transparent in sound

<b>Audio Scene</b>	132 CHATSWORTH ROAD, BRAMPTON CHESTERFIELD DERBYSHIRE S40 2AR Tel: 0246 204 005
<b>Brentwood Music Centre</b>	2 INGRAVE ROAD BRENTWOOD ESSEX Tel: 0277 221 210
<b>Cornflake Shop</b>	37 WINDMILL STREET LONDON W1P 1HH Tel: 01 631 0472
<b>Doug Brady Hi-Fi Kingsway Studios</b>	KINGSWAY NORTH WARRINGTON TEL: 0925 828 009
<b>Doug Brady Hi-Fi</b>	14/18 MONMOUTH STREET COVENT GARDEN LONDON WC2H 9HB Tel: 01 379 4010
<b>Graham's Hi-Fi Canonbury Yard</b>	190a NEW NORTH ROAD LONDON B17 BS Tel: 01 226 5500
<b>KJ Leisuresound</b>	26 NEW CAVENDISH STREET LONDON W1M 7LH Tel: 01 486 8262/3

DNM Distribution Ltd  
PO Box 383,  
Brentwood,  
Essex,  
CM1 4GB.

Tel. (0277) 227355 Fax. (0277) 224103

HI-FI CHOICE RECOMMENDED

# Concordant EXCELSIOR VALVE AMPLIFIER

If you would like to audition the Excelsior Preamplifier please contact your local agent:

**HERTS**  
RADLETT  
(0923) 856497

**GUILDFORD**  
HI-FI HOUSE  
(0483) 575015

**LEEDS**  
CONCEPT HI-FI  
(0532) 698037

**LEICESTER**  
MJS HI-FI  
(0455) 846977

**CHESTERFIELD**  
AVONDALE AUDIO  
(0246) 200096

**CREW**  
HIGHTOWN AUDIO  
(0270) 211091

**AYLESBURY**  
AYLESBURY HI-FI  
(0296) 28790

**UXBRIDGE**  
AUDIOCRAFT  
(0895) 53340

**SUFFOLK**  
DAVERINE ACOUSTICS  
(0502) 731002

**GLASGOW**  
MUSIC ROOM  
(041) 248 7221

**RUGBY**  
ILES HI-FI  
(0788) 72983

**MANCHESTER**  
MUSIC ROOM  
(061) 835 1366

WE HIGHLY RECOMMEND CONCORDANT PRODUCTS FOR THEIR PERFORMANCE AND RELIABILITY - ALSO FOUR YEAR GUARANTEE INC. VALVES

Also Available: HOLLAND · GERMANY · ITALY · CANADA · NEW YORK · GREECE

## INSULATION FIBRE

WE ARE SPECIALIST PRODUCERS OF ACRYLIC FIBRE BLENDS SUITABLE FOR RADIO INSULATION, ACOUSTIC WADDING, AND SIMILAR PURPOSES, AS USED BY A.T.C.

SAMPLES AND FULL DETAILS AVAILABLE UPON REQUEST

FROM  
**M., J. & G. STROSS LTD.,**  
SCOUT HILL MILLS,  
DEWSBURY, WEST  
YORKSHIRE, WF13 3RL.

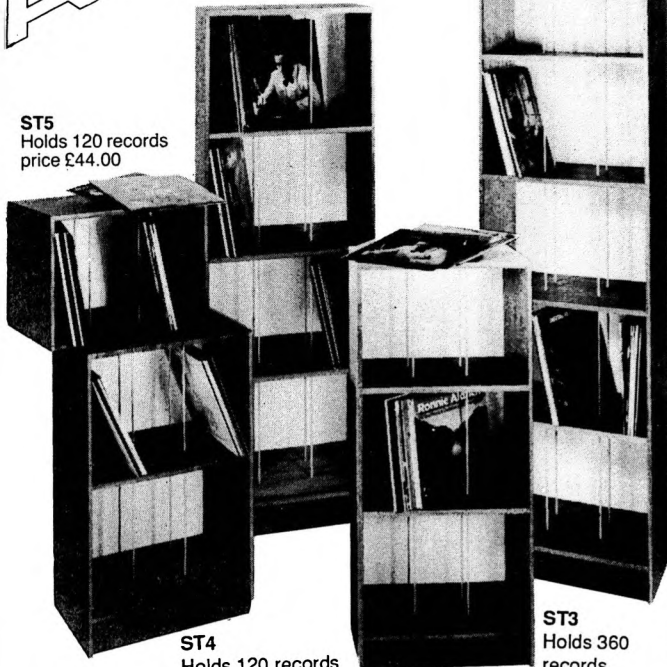
PHONE: (0924) 465904. FAX: (0924) 430325.  
TELEX: 55107 STROSS G.

# ARJAY

**ST2**  
Holds 480 records  
price £162.00

**ST1**  
Holds 600 records  
price £192.00

**ST5**  
Holds 120 records  
price £44.00



**ST4**  
Holds 120 records  
price £97.00

**ST3**  
Holds 360 records  
price £131.00

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, at 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 .....



# THE DIRECTORY

The *Hi-Fi Choice Directory* was conceived as a reference guide to all the audio products reviewed by *Choice* that are currently available. The products are split into suitable categories, each with its own introduction containing information about the product type and its applications. They are particularly relevant to the uninitiated first time buyer and help sort out the order of priorities when buying a piece of equipment.

Each product along with its retail price is placed in its respective category in alphabetical order. For instance the Acoustic Research *EB101* is presently at the beginning of the Turntables and Tonearms section; however, the Ariston *RD90 Superior* heads the Motor Units section as it is sold and was reviewed as a separate component – requiring a separate arm. Where there are several products with the same name but different model numbers these are in price ascending order.

Then come the ratings for the standard achieved in laboratory and listening tests, with the exception of certain product groups where lab tests were not carried out. One important point to remember is that they cannot be used to compare products from different categories – ie a cassette deck rated 'excellent' in sound quality will not usually offer the same standard of fidelity as a similarly rated

turntable or CD player (unless you can get hold of first generation copies of the master tape!).

The Comments column contains a potted summary based on the original review, emphasising the salient points of a product's character and sonic performance. The space available doesn't allow for great detail but in the 20 or so words we have attempted to put across the essence of the review, in some cases using quotes from the review itself. Obviously, important information on compatibility or auxiliary equipment used in the test cannot be included, and it is best to refer to the original review for this, of which more later.

The next column(s) varies from category to category but is usually either features or specifications, the former being facilities available on a cassette deck or amplifier or the type of drive system on a turntable.

Specifications vary with product type but usually relate to suitability or capability, for instance arm matching figures are given with the cartridges which tie in with the mass figures for the tonearms themselves, making it easier to avoid compliance/mass mismatches.

Perhaps the most influential letters in the Directory are those found in the Value column, the *Rs* and *Bs* denoting the Recommended and Best Buy ratings that are appended to products we consider meritorious. The Best Buy tag means that a product not only offers good sound quality but is reasonably priced as well. With source components a price limit of approximately £300 is usually used as a

guide. Recommended means that either the performance of a product is particularly good irrespective of price or, alternatively that a good value standard is achieved but overall attainment falls short of Best Buy classification. An ideal situation would be to choose suitably priced Best Buy or Recommended products from relevant categories and create a Best Buy system, but, due to the variety in tonal balance that exists in much audio equipment (especially the electromechanical elements – ie cartridge and speaker) system building is not quite that simple. These ratings make a useful guideline for shortlisting components, but only experiencing the actual combination will tell you whether it works for you.

The final column contains a reference to the issue of *Hi-Fi Choice* which featured the complete review. If you wish to get a better idea of a product by reading the complete review it is possible to order a copy (if still in print) through our back issues department. Every *Choice* issue contains a Back Issues page for this purpose.

The Directory is constantly updated with the latest reviews and price changes as well as having discontinued products removed. If a listed product is updated to a 'mark two' form and the alterations are purely cosmetic or not too extensive we sometimes leave the product in with its current model number and an asterisk to denote that it has changed since our original review was published.

## SYSTEM BUILDING

Pre-packaged one-make systems have been commercially very successful, with advantages like cosmetic consistency, competitive pricing, and (assumed) technical compatibility. However, despite the mass market clout of the consumer electronics giants, the hi-fi tradition of specialised separate components seems as strong as ever, and certainly represents the route taken by those who place sound quality ahead of other criteria.

Yet those who choose the separates route still have lingering doubts – usually completely unjustified – over the compatibility of components from different manufacturers. Gross incompatibilities are very rare nowadays, only likely to rear their heads amongst the most exotic components. Here the delicate art of 'supercompatibility' really takes over the major role and might be regarded as the key to 'real' hi-fi.

There are now three different pre-recorded music media competing for the attention of the hi-fi user, and to go for all three will either cost a lot of money or involve substantial compromises in the sound quality of each. For this reason many separates purchasers may start with just one source, adding others or a tuner when funds permit.

There will always be controversy over the relative qualities of LP, CD and cassette. LP is still the choice for ultimate sound quality – particularly for those prepared to spend a substantial sum on a good quality turntable system. Furthermore the vinyl repertoire is still the cheapest, largest and most varied.

Cassette has never really challenged vinyl's superior quality, but it is a multiple role format, offering 'go anywhere' flexibility, a uniquely useful recording capability, plus a broad catalogue of pre-recorded music cassette material. As a hi-fi medium cassette suffers from pre-recorded material which has been improving but is still patchy in quality, and can usually be bettered by a home recording. There is also the worry that a tape made on a specific machine usually replays best on that machine, which may cause aggravation when upgrading a few years hence. It is worth remembering that though such opportunities are rarely possible or practical, a live recording onto cassette using good quality microphones can be the hi-fi equal of any other source.

CD is the latest challenger to these two established media, using a digital instead of analogue storage format. The sound quality remains controversial, hailed as near perfect by its fans but derided by vinyl freaks, so it is probably fairest to say that CD is fine for most listeners, but may not suit everyone, certainly the lack of background noise, defects and deterioration over time are major strengths.

While there will always be arguments about the different music storage and transmission formats available to the hi-fi listener, there is also controversy over the relative importance of the different components which make up the system chain – by which is meant the source, the amplification, and the loudspeakers (and for the pedantic the room itself, though there's often little that can be done here).

For many years the 'weakest link' theory proposed that the loudspeakers needed the most attention, that amplifiers merely had to have sufficient power, and that turntables were pretty well perfect. However, this perspective has become steadily discredited by an alternative 'theory of precedence', which stresses that no subsequent component can make up for the inadequacies of its predecessors – all it can do is supply its own additional degradations. In such a context it is not uncommon to find more than half the system budget allocated to the record player, with scrimping and saving made on amplifiers and loudspeakers, even though these are used all the time whatever the source.

Choosing the components of a system is only part of the task of getting the system as a whole working as well as possible. Good turntables and loudspeakers both benefit to a surprising degree from proper support – from stands that enable them to give their best performance, whether floor-standing or wall mounted.

Siting of components within a room can play a significant role, as can the room itself. Some people may prefer an acoustically more 'live' room than others, but most will agree that the larger it is the better, because this tends to provide smoother and better extended bass reproduction. All rooms create reflections and standing waves, and the effects of these are more severe if all opposing walls are parallel, similar distances apart, and with hard reflective surfaces. Provided that the loudspeakers can be placed fairly symmetrically, slight asymmetry elsewhere in the room is usually helpful.

The loudspeakers are most critical of placement, because it is their job to create the stereo image, and it will be impossible to do this if the sound from each is not roughly similar at the listening position. Each loudspeaker should operate in a similar immediate acoustic environment, unencumbered by other furnishings and structure, and a similar distance from listener, nearby walls, and corners. Some loudspeakers are designed to operate close to a rear wall, others a metre or so out into the room, but all loudspeakers benefit from being closely mechanically coupled via proper stands to the floor.

There is some debate about the best form of fixing, however, adjustable spikes through to the

floor proper or seated into the tops of cross-head screws are generally regarded as the best solution in most circumstances. There is no need for paranoia about using spikes through normal pile carpets because the holes will be almost impossible to find when the stands are removed.

Most decent quality turntables are fairly immune to feedback from loudspeakers, so it should not matter too much if these items are sited fairly close to each other. Indeed it is debatable whether any advantages gained from keeping the turntable well away are not lost through the need to use longer connecting cables.

Mixing and matching the components of a record player to get optimum results can be something of a black art, over and beyond the fairly simple business of choosing a cartridge of roughly the right compliance to suit the arm effective mass. Certainly the combining of turntables and tonearms is not a simple matter, and this is where a good specialist dealer will come into his own, both in terms of recommending good combinations from the models he holds in stock, and then in correctly carrying out the sometimes tricky set up procedures which are often required to get the best results.

The key to getting the best results from a separates system lies in finding an experienced and skilled dealer in the first place, one who takes the trouble to find out what you really want and then demonstrate some likely alternatives, without trying to cram his own particular prejudices down your throat. To some extent the customer's task must be to discover for himself whether the dealer in question is competent or not. Membership of trade organisations like BADA can be a worthwhile pointer to a degree of professionalism, but the bottom line is whether the dealer in question can create a good sound in his own shop. If he can't, there is precious little chance of him doing so in your home. The best dealers should lay on demonstrations so you can hear the differences between components for yourself, and hear the sort of improvements which can be had at different price strata. You can then establish the sort of performance you are prepared to accept within whatever budgetary constraints you have set.

The Directory has been compiled so that it can be used by *Choice* readers as a buying guide. A guide in the sense that you should use the information in it to make a shortlist of equipment suited to your needs and budget, and then addition it to a dealer before taking the plunge. Because tastes inevitably differ it would be unwise to buy purely on the basis of our recommendation and dealers are the most experienced people around when it comes to making systems work as a whole.

# THE DIRECTORY

## TURNTABLES & TONEARMS

The schizophrenic split between consumer electronics and 'real hi-fi' is most obvious amongst turntables. The former are supplied simply as a means of playing vinyl in a system context. Cheaply manufactured in the Far East, these are complete players with a variety of automatic facilities, sometimes tied into system remote control. But engineering compromises severely limit sound quality, cartridge choice may be P-mount restricted, and such machines are rarely stocked by specialist hi-fi dealers these days.

Specialist turntables offer big sound quality

improvements, but lack so-called convenience features (that practised users often find irksome). Such turntables at the cheaper end of the market (sub-£350) tend to be supplied with matching tonearm, and often include a 'starter' cartridge. Still better quality is found at higher prices amongst the separate motor units and tonearms. Careful partnering and set-up is essential for these individual components, but 'naturally sympathetic' combinations do exist, and the good dealer can help.

Listed separately as integrated players and as turntable motor units and tonearms, our **sound**

**quality** rating is based on results achieved using a high quality system – but in point of fact the turntable is usually the limiting factor soundwise in any system. **Lab performance** summarises the speed stability, vibration generation and environmental isolation of turntables, along with the friction, alignment and adjustment of tonearms. The tonearm's physical characteristics also define a range of mechanically compatible cartridges (see cartridge listings).

### INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research EB101 £230	Good Good	This genuine high fidelity product offers an impressive package at a competitive price	Subchassis, manual, 13.5g	BB	48
Alphason Solo/Xenon MCS £365/£262	Average+ Good	The deck is warm and euphonious with high levels of clarity. Wow artefacts occasionally just audible.	3 point suspended motor unit, optional quartz PSU/speed change 13g		67
Alphason Sonata/HR-100S-MCS £720/£480	Excellent Very Good	Highly capable audiophile system with real resolution and control. Bass is powerful and dynamic ability unbridled	Manual, subchassis, belt drive, 10g	R	60
Ariston Q-Deck £150	Good Average+	Well engineered and good sounding low cost package which is both easy to set up and to use	Semi-auto, belt drive, solid	BB	67
Ariston Forte £350	Average— Average	Heavy on engineering, short of soul? The Forte almost makes it, losing out only because of some residual pitch variations and a lack of bass power. The arm is modestly good	Manual 2-speed belt drive player and detachable arm, 10g		67
Dual CS430 £89	Average Average—	Ragged, sometimes unpleasant cartridge mixes with a modest pleasing player in a very sharply priced package.	Belt drive, with cartridge, auto return, 5g	R	67
Dual CS503-1 £114	Poor Average	Slated as a replacement for the CS505, the 503-1 needs careful system matching to mask rumble and microphony, but is good enough to benefit from a better cartridge	Semi-auto, belt drive, low mass arm	R	55
Dual CS505-3 £139	Very Good Good	Continuous steady improvements have kept this model at the forefront of the budget market. Practicality is excellent and the deck has excellent timing bass/mid and stereo imaging	Semi-auto belt-drive, 8g	BB	67
Dual CS5000 £200	Average Average+	The rare 78 facility may give grandma's collection a new lease of life but the player did not merit recommendation on price vs sound	Electronic, belt drive, subchassis, 10g		48
Goldmund ST4 £4,550	Very Good Excellent	The Studio turntable takes on a cheaper tonearm than the T3F, yet provides a similar reference standard objective and subjective performance at £2,000 less, in a neatly integrated though bulky package.	Solid subchassis, direct drive, parallel arm, detachable headshell	R	60
Heybrook TT2 turntable & arm £349/£249	Average Good+	A gradual process of informed evolution and a sensibly designed arm combine to make this a good sounding middle of the road package. Well supported by dealers	Manual subchassis motor with arm, belt drive, 14g	R	67
JVC AL-FQ555 £170	Below Average Poor	Clear midband sound but woolly bass and crude treble. Ease of use however ranks highly, and there's little to go out of adjustment	Auto, direct drive, 5.5g		67
Kenwood DP-990 £300	Average Average	Smart, slick and massive player suitable for low compliance cartridges only. A good but not inspired performer.	Semi-auto 2 speed direct drive, 16g		67
Kuzma Stabi/Stogi £575/£349	Average+ Stabi: Good; Stogi: Excellent	Stabi is powerful, spacious but not sufficiently subtle. Stogi is an excellent all rounder with even spread of abilities.	Manual, belt drive, subchassis. 12.5g	Stogi: R	60
Linn Axis £379	Good+ Good+	Setting new performance-for-price standards this cleverly engineered and competent deck has many of the qualities of the Sondek LP12; arm has been upgraded to Akito since this review	Electronic, belt drive, semi subchassis, 13g	BB	48/Coll
Linn Sondek/Ittok/Troika £509/£429 (£669)	Excellent Very Good	Superb sound – the best LP12 combination yet. The Troika gives the system real solidity and strength, stretching the deck and arm qualities to the full	Manual subchassis player, belt drive, 14g	R	60
Manticore Mantra £325/£403 (Arm)	Good+ Good+	Fitted with a Rega RB250 arm variant and AT95E cartridge the Mantra fared very well indeed with a fine midrange and good focus	Subchassis, 12g, manual	BB	48/Coll
NAD5120 £89	Average Average	A number of running improvements have given this player a range and tautness denied its lazier sounding antecedents.	Semi-auto belt drive, detachable arm/tube/weight, 9g	BB	67
Omega Point Silver/Black £895/£295	Good Good+	An avowedly stripped down turntable that lacks even an on/off switch, the Omega Point Silver offers fine midrange clarity and good stereo, but some HF compression and a lack of 'wellie'	Manual, solid, belt drive, unipivot, 11g		55
Opus 3/Decca London International (Revised) £399/£99	Poor Good	Heavyweight motor unit with many fine properties, but which needs further development. The idiosyncratic arm is a suitable (though not ideal) platform for the Decca cartridge. For all its faults though, the whole transcends the sum of the parts	Belt-drive manual, damped unipivot arm, 12g		67
Rega Planar 2 £155	Average+ Good	A remarkable product at the price, surprisingly articulate and confident	Integrated turntable, manual, 11.5g	BB	48
Rega Planar 3 £207	Good Good	A long time leader in its price category, the '3 (with its excellent RB300 arm) sounded nicely 'musical' in a balanced and coherent manner	integrated turntable, manual, 11.5g	BB	48
Revolver Rebel £160	Average— Average—	Fat, assured and forward presentation, but ragged and subjective speed stability problems. With a little further development, it will be a winner	Manual, 2-speed belt drive inc cartridge, 13g		67
Revox B291 £660	Average— Average—	Sound quality ranks as below average. Subjective bandwidth is narrow and the music lacks grace and energy. Ease of use however is unrivalled	Automatic, remote controllable, direct drive parallel arm, prefitted cartridge		55
Roksan Xerxes/Artemiz/Shiraz £695, £495, £595	n/a Very Good	Imaginatively designed, sophisticated front-end system, a little drier than some perhaps, with superior stereo, resolution and presence	2-speed manual, MC cartridge, 9g	R	72
Sansui SR-222 Mk V £159	Average— Average	More than acceptable in most areas, the Sansui is detailed and positive, though a little muddled when stressed. Best suited to low compliance cartridges	Manual 2-speed belt drive, 16g		67
Systemdek IIX £248	Good Average+	Poised, clean sounding deck, forward and explicit in character. A good value deck under £250, and a relatively cheap and satisfactory suspended model	2 speed belt drive manual turntable and arm, 11g	R	67
Technics SLBD-22 £90	Average— Average—	Not bad for the price and a great improvement on the L20, it performs reasonably when not stretched	Semi automatic, solid plinth, electronic, 6g P-mount	R	48
Technics SL-DD33 £110	Average Average	As with the QD33 though better value	Automatic, direct drive, solid plinth, 7.5g, P-mount	BB	48
Technics SL-L20 £115	Poor Average—	A rather lightweight parallel tracker achieving a poor overall rating, with little to recommend it unless you dig facilities	Electronic, solid plinth, 5g, P-mount		48

# THE DIRECTORY

## INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Technics SL-QD33 £140	Average Average	The quartz speed controlled version of the DD is short on sound quality but not features. But it did have fair focus and some depth	Automatic, Quartz, direct drive, solid plinth, 7.5g, P-mount	R	48
Thorens TD280 £150	Average Average	Extremely competitively priced package with a trace of lower-mid overhang, but it's very well behaved elsewhere	Semi-auto belt-drive 2-speed, 13g	BB	67
Thorens TD166 Mk II £179	Average Average+	A polished and professional design consisting of a first rate budget suspended subchassis turntable and a mildly disappointing arm	Manual 2-speed, 13g	BB	67
Thorens 160S Mk IV £249	Average+ Average+	Fine, familiar suspended player and arm. Faults are few, but include poor arm bearing adjustment. The arm can sound a little messy	Manual 2-speed, 7g	R	67
Thorens TD320 Mk II £349	Good Good	Good, consistent sounding deck with much improved (but not ideal) arm. A little expensive for performance offered	Semi-auto two speed belt drive, 14g		67
Well Tempered Turntable & Arm £1690	Average Very Good	Intriguing and challenging design. Musically it is not ideal, but it has a limpid quality and a lack of artificiality that sets standards as well as turning the ear, though it's not completely uncoloured. A charmer yet mainstream enough in its virtues to be viable	Manual 2-speed, damped, suspended arm, 7.5g	R	67
Zarathustra S4/Pluto 5A Prestige/PSU £1500/£2500/£500	n/a Excellent	The very well made and finished heavy platter S4 with the superb Pluto arm make a devastating combination ranking up there with the very best	Subchassis, manual, available without PSU	R	72

## MOTOR UNITS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ariston RD90 Superior £900	Good+ Good	Good but slightly damped sound quality, with powerful and stable bass. The pro quo is a certain lack of pace, energy and resolution	Belt drive, subchassis, electronic		55
Michell Synco £265	Good Good	A particularly happy blend of qualities endows the Synco with a blend of subtlety and force – the mailed fist in the velvet glove. Easy on the ear in the best sense.	Manual, belt drive, suspended motor unit	R	67
Michell Gyrodec £595	Good Good	Sweet and natural sounding player, well exploited by the Rega RB300 arm. Aesthetics, and the acres of acrylic, are unique	Manual, belt drive, suspended motor unit		55
NVA 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 $\frac{1}{3}$ rpm		60
Oracle Alexandria Mk III £825 – £995	Very Good Very Good	One of the most beautifully presented players made, and fully supported by superb separation, dynamics and a euphonious style of delivery.	Manual 2-speed belt drive	R	67
Oracle Delphi III £1450	Very Good Very Good	Stable imaging, good bass and refined detail, it's well made and consistent in service – but very expensive	Manual, belt drive, subchassis	R	60
Oxford Acoustics Crystal Reference £1995	Very Good Excellent	This big, open and powerful sounding turntable works beautifully with Airtangent arm to give superb 3-D imagery	Manual, belt drive, subchassis, stand	R	60
Pink Triangle PT 200 £650	Good Very Good	A state of the art player, easy to set up but extremely fussy about partnering equipment and state of tune. The test sample suffered flutter derived roughness (presumed not typical)	Manual 2-speed, outboard PSU	R	67
Rega Split Slab Modification Kit £74	Good Good	Clever and cheap upgrade kit that protects the initial investment and which adds clarity and environmental isolation to a fine but microphonic original	Conversion suspended chassis kit for Rega 2/3		67
Roksan Xerxes £695	Excellent Very Good	This unique design cuts a swathe through the conventions of turntable design, providing superb resolution and stereo. Like all sophisticated decks, setting up is best left to a dealer	Manual, belt drive, solid/decoupled	R	67
SEE Revolver £135	Average Average	Nicely balanced, but unimpressive timing and lightweight bass made this deck rather average for the price. Manufacturer has since made several changes, but not re-submitted for review	Manual, belt drive, solid plinth		48
Systemdek IIXE £248	Good Very Good	Fine, honestly specified and well built player which easily betters its closest stablemate, the IIX. Frankly, at the price it's a sonic bargain	Manual 2-speed, external PSU	R	67
Systemdek IV £495	Good Very Good	The level of wow is a theoretical concern at least, but elsewhere this player shines, combining euphony, information and imaging in a polished, untemperamental package	Two-speed manual belt drive	R	67
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
Voyd "The Voyd Plus" £2,522	n/a Excellent	Based on the standard 3-motor Voyd but with upgrade options (better bearing, platter, etc) which take it half way to a Voyd Reference, so we've dubbed it The Voyd Plus. Superb build and finish, colourful, dramatic performance. A thoroughbred	Belt drive, 3 motors, subchassis, outboard PSU	R	72

## TO NEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARMEFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Alphason Opal £110	Good Average	This is a straightforward adequate sounding low cost arm, priced just above where it rightly belongs	10g		55
Alphason Delta £165	Good Average+	A highly competent design from Alphason gives good sound quality but with slight blurring and treble fizz	16g	R	48
Alphason Xenon £210	Good Good+	A trimmed down HR100S, the Xenon has inferior bearings and a simpler finish, but sounds crisp and coherent. Fits any Linn cutout	12.75g	R	55
Alphason HR100S £395	Good+ Very Good	This S-shaped arm sounds smooth, but nevertheless reproduces transients with fine attack	10g	R	48/Coll
Ariston Enigma £99	Average Average+	Good but not the best in its class: mid-band sounds a little uneven, treble a trifle "brash"	11.5g		48
Audio Technica AT1130 £186	Good Good	Well suited to most cartridges including high compliance ones, the AT is smooth and tonally neutral, if slightly lacking in 'balls'	8.5g	R	67
Decca International £49	Average+ Average+	This uni-pivot design gives a rather rich tonal balance and some bass muddling. Could be good with Decca cartridges, but not well built	12g		48/Summary
Eminent Technology £1000	Good+ Good++	One of the best sounding tonearms around, the linear tracking Eminent delivers impressive stereo imagery, focus and transparent sound	9g (vertical)	R	48/Coll
Goldmund T3F arm £3950	Excellent Excellent	This complex parallel tracker created an "ear-opening" experience when tested with a (since updated) Goldmund Studio turntable	16.5g	R	Coll 2
Grace G707 £299	Good Good+	This venerable is still capable, if not competitive with modern alternatives	7g		48
Helius Orion 2 £490	Very Good Very Good	Excellent engineering with rigid bearings, free from slack. It remains expensive but the level of performance deserves Recommendation	12g	R	48
Linn Ittok LVII £429	Very Good 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	67

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

# THE DIRECTORY

## TONEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Mission Mechanic £900	Good Good+	Nearly right, but inconsistency with level and vague imagery spoil what is otherwise a firm, powerful advocate for black vinyl	11g		55
Moth Arm £78	Good Good+	The ultimate budget arm? Refined, detailed, sweet and natural – performance improves in line with the rest of the system	12g	BB	60
Rega RB300 £115	Good+ Good++	Despite its modest price this sets exceptional performance standards and could be used on a number of high-quality turntables	10-11g	BB	60
Roksan Artemiz £495	Average Good	Interesting design which works a treat on the Xerxes deck. Fits Rega cut-out. See issue 72 for up to date assessment	8g		67
SME 3009 Series IIIS £165	Good Average+	A simplified less flexible (as regards adjustment) Series III with a similarly 'soft' sonic character	5g		48
SME 3009 Series III £229	Good Average+	Comprehensively adjustable and very well made, suited to MM and high compliance MC cartridges	5g		48
SME 3009R £291	Average+ Average+	A higher mass version of the Series III designed for low compliance MC cartridges	12g		48
SME Series IV £810	Excellent Very Good	Superb engineering and finish with a finely balanced sound giving impressive stereo focus and low coloration	10.5g	R	60
SME Series V £1206	Excellent Very Good	Excellent in terms of design engineering and sound quality, this arm arguably sets a new reference standard regardless of price	10.5g	R	60
Souther Tri-Quartz £895	Average Good	A unique parallel tracking arm that makes up for what it lacks sonically in its unusual appearance	3-4g		48

## CARTRIDGES

Very much the 'slave' of turntable and tonearm and to some extent undermined by the supply of free 'starter' cartridges on many turntable systems, the cartridge is still worth taking seriously. The quality of both the stylus itself and the cartridge's tracking performance are important in preserving that most important part of the hi-fi system – the record collection – and the cartridge also plays a significant role in determining the overall balance of a system.

Cartridges fall into two groups: high output models, capable of working directly into any amplifier, and more expensive low output models. Stereotypically, low output cartridges use the moving coil principle of operation, have better mechanical integrity and tighter tolerances, and give better performance but at much higher cost. Most under-£150 amplifiers and many valve designs need either an extra head amp or transformer to cope with the low output. **Cartridge/amplifier**

interfacing can be very subtle, but even basic high output moving magnet designs benefit in overall balance from optimised amplifier capacitance loading. Still more important, the mechanical cartridge characteristic of cantilever compliance ('springiness') needs to be considered in the light of the effective mass of the tonearm which will be used (see Turntable & Tonearm entries).

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
A&R C77 £20	Average+ Average+	A sensible moving magnet package with good bounce at a competitive price	6-16g Normal, MM	BB	48
A&R C77Mg £30	Average- Average	Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8g Normal, MM	BB	67
A&R E77Mg £47.50	Average Average	Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8g Normal, MM	R	48
A&R P77Mg £60	Average+ Average+	Cautiously recommended, the P77Mg was preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9g Normal, MM	R	48
Audionote ID2VDH £795	Good Very Good	One of the best, giving 'an extraordinarily relaxing midrange clarity'. But it picked up a bit of surface noise and dust and needs a transformer	8-18g Very low (transformer), MC	R	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	67
Audio Technica AT-430E OCC £42	Average+ Average	A rising high frequency response yields something of a treble sting, not a good all-rounder	3-7g Normal, MM		67
Audio Technica AT-F3/DCC LE £70	Average+ Good	Though the 'limited edition' badge is a trifle tongue-in-cheek the 'F3 still offers excellent value	8-15g Low, MC	BB	67
Audio Technica AT-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/DCC LE £100	Average Good+	This latest sample demonstrated some technical weaknesses but its spacious, fluid sound quality still represents a benchmark at this price	4-10g Low, MC	BB	67
Audio Technica ATOC7 £250	Good+ Good+	The OC9 is better if you can afford the extra. But OC7 is at least a taste of the high-end at a sensible price	6-13g Low, MC	R	54
Audio Technica ATOC9 £400	Average+ Very Good	Tonal colours are reproduced faithfully and it rarely puts a foot wrong. Slightly less transparent than more costly MCs but it has got real wellie. Good value (really!)	6-14g Low, MC	R	60
Audio Technica ART1 £800	Good+ Very Good	This is a delicate and very fluid-sounding MC that tracks well, offers very low distortion and exceptionally good stereo separation	9-18g Low, MC	R	72
Azden YM10VE £12.50	Average Average-	A good tracker. Sounds rather bunched-up but not totally incoherent – for very basic systems only	5-15g Normal, MM		54
Azden GM1E £30	Average- Average-	Of academic interest only, this high o/p MC is seriously flawed in sonic terms	8-18g Low/normal, MC		54
Azden GMP5L £108	Average+ Average+	Although no P-mount system will do this cartridge justice, it can still be enjoyed in its universal mode. The subtle balance may prove irresistible to some	4-10g Low, MC	R	54
B&O MMC5 £24	Average+ Average	Cheapest in the family – smooth treble and good focus, but the bass was left in the wings	5-15g Normal, MM		38 (Summary)
B&O MMC4 £43	Good Average+	Solid and well balanced in the midrange, the '4 lacks bass impact	5-15g Normal, MM		48
B&O MMC3 £57	Good Average	Slightly "laid back" sound quality but a good performer for the price. Best suited to B&O equipment	5-15g Normal, MM		48
B&O MMC2 £87	Good Average+	Only a modest improvement on its cheaper brothers (and sisters)	5-15g Normal, MM		48

## 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
<b>B&amp;O MMC1</b> £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
<b>Cello Chorale</b> £590	Average + Good	Now available through a new distributor at a saving of some £300, the Chorale is still blessed with a delicate but highly detailed treble. Arm matching is a problem	3-9g Low, MC		72
<b>Clear Audio Gamma</b> £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
<b>Clear Audio Delta</b> £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
<b>Clear Audio Signature</b> £995	Average + Good	This latest MC to emerge from Clearaudio features yet another graded version of its proprietary generator. Its sound strikes a balance between the Delta and Prad	4-11g Low, MC		72
<b>Clear Audio Pradikat</b> £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
<b>Clear Audio Accurate</b> £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
<b>Denon DL110</b> £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
<b>Denon DL160</b> £89	Average + Good	Although listeners just preferred the 110 its brother here proved a twin in lab tests and is still "thoroughly competent"	6-16g Normal, MC		43
<b>Denon DL 103</b> £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
<b>Dynavector DV-50X</b> £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
<b>Dynavector DVTDX IV</b> £60	Average Average +	Fine sounding and realistically priced, damping is recommended to ensure successful tracking ability	8-18g Normal, MC	R	48
<b>Dynavector DV23RS</b> £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
<b>Dynavector DV XX-1</b> £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
<b>Empire 800 Mk II</b> £33	Good Average	This very high output MM appears to be based on the classic Ortofon VMS series. A trifle uninspiring overall	7-17g Normal, MM		67
<b>Empire MC-5M</b> £110	Average + Good	A very low compliance renders this MC best suited to heavy tonearms while its sweet, non-aggressive sound quality earns it a recommendation	13-20g Low, MC	R	67
<b>Empire Benz Micro MC-2</b> £600	Average Good +	Similar to both the Empire MC1000 and vch MC2 in design, the Benz offers a warmer and very transparent account of the music. Its tracking prowess is slightly limited	5-12g Low, MC	R	72
<b>Glanz MFG 110EX</b> £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
<b>Glanz GMC-10EH</b> £49	Good Good	The rising HF trend of this high o/p MC may cause problems in certain systems but with a favourable wind its seductive qualities will win out	8-14g Normal, MC	R	67
<b>Glanz GMC-10LX</b> £79	Average + Average +	Bearing some of the hallmarks of the '10EH, the '10LX is still less competitive in the sonic stakes	7-15g Low, MC		67
<b>Glanz GMC20E</b> £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
<b>Goldmund Clearaudio</b> £1500	Average + Very Good	Something of a mixed bag overall, its sonic character bears a strong resemblance to the Pradikat though it shares some of the hallmarks of the more expensive Accurate	5-12g Low, MC		60
<b>Goldring Elan</b> £15	Average + Average	A lightweight and frisky-sounding MM that appears to be based upon the same body as the Nagaoka mm4	7-15g Normal, MM	R	67
<b>Goldring Epic II</b> £23	Average Average +	An excellent budget choice though the limitations of the stylus are rather obvious at higher frequencies	5-12g Normal, MM	R	67
<b>Goldring G1020</b> £53	Average + Average –	This one strutted finely onto stage but couldn't project to the "gods"	8-16g Normal, MM		43
<b>Goldring G1040</b> £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
<b>Goldring Eroica L</b> £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
<b>Goldring Electro II</b> £149 complete	Average Average +	A pretty decent allrounder; a good cartridge, in fact – but a bit pricey	8-16g Normal, MC		43
<b>Goldring Excel</b> £500	Average + Good	Goldring's most expensive cartridge to date errs on the warm and heavy side of neutral. Strong bass lines are its forte though its ability to resolve subtle treble details is weaker	6-13g Low, MC		72
<b>Grace F9E II</b> £240	Good Good	For lively presentation, excellent separation and generally satisfactory sonic delivery – consider this model	5-10g Normal, MM		48
<b>Grado XTE +1</b> £22.50	Average – Average	Bass and treble are a trifle coloured but the midband proved highly enjoyable. Ideal for budget systems	6-13g (damping) Normal, MM	R	54
<b>Grado XF3E +</b> £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
<b>Highphonic MCA3</b> £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
<b>Kiseki Blue Silver Spot</b> £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
<b>Kiseki Purpleheart Sapphire</b> £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
<b>Kiseki Blackheart</b> £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
<b>Kiseki Lapis Lazuli</b> £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
<b>Koetsu Black S</b> £599	Average Good +	The S is an OEM design built to Koetsu's blueprint. It features a sturdier fixing plate and offers a brighter, faster and more tactile sound than the earlier K	8-15g Low, MC	R	72
<b>Koetsu Red</b> £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
<b>Koetsu Red Signature</b> £1391	Good Excellent	Technically this cartridge suffers no faults whilst on a subjective level it offers rare musical insight	10-21g Low, MC	R	60

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

## THE DIRECTORY

## CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Krell KC-100 £700	Average Good	Apparently based around a similar generator as the Cello Chorale, the Krell provides a similarly light and airy sound. Low mass arms with damping are best used	3-9g Low, MC		72
Linn K5 £30	Average Average+	Not as crisply focused as the costlier Linn magnetics, the K5 offers a smoother presentation	7-16g Normal, MM	R	67
Linn K9 £75	Average Good	Linn threw this model into the leading pack by beefing up the Basik's bodywork, adding a super stylus, and keeping the price fair	6-15g Normal, MM	BB	48/Coll
Linn Asaka £299	Good+ Good+	Disciples of Linn who are trying to realise their true "Karma" may find that saving money is not a short cut to heaven	9-18g Low, MC	R	48/Coll
Linn Karma £435	Very Good Very Good	A specialist which is strongly recommended for Linn-based systems; results may be less predictable in more general application	9-18g Low, MC	R	48/Coll
Linn Troika £669	N/A Very Good	Ex-Karma users have been seen with glazed expressions indicating smug self-indulgence the morning after fitting a Troika	8-18g Low, MC		Coll
London Maroon £109	Average Average+	Now manufactured under the London brandname this Decca cartridge is as iconoclastic as ever	9-20g (damp) Normal, MM		67
London Super Gold £248	Average- Good+	Sometimes a bit fierce in emphasising record surface faults, it is perhaps best at revealing the excitement and tension in music	8-20g + damping Normal, MM	R	48/Coll
Madrigal Carnegie One £685	Average+ Good	Looks like a duck but sounds much better, certainly worth auditioning. Compliance too high	5-11g Low, MC		54
Milltek Aurora £198	Good+ Good+	An overall feeling of relaxed ease characterised this clear and atmospheric Kiseki-built cartridge	8-16g Normal, MC	R	48/Coll
Milltek Olympia £298	Average+ Good+	Warm and detailed sound - packs the punch of the best MCs with high output as a bonus	12-20g (damping) Normal, MC	R	54
Mission 773HC £150	Good Good	A sufficiently well-balanced and competitively priced "old-timer" which still warrants recommendation	6-16g Low, MC	R	38
Monster Alpha 2 £479	Good Good+	In the final analysis this fine allrounder is insufficiently exceptional in any specific respect to justify fully its high price	6-14g Low, MC		Collection
Nagaoka MM4 £8	Average- Average-	Clear punchy sound that delivers the rudiments of a good performance	6-16g Normal, MM	R	54
Nagaoka MP10 £17	Average Average	High frequencies sounded "shut-in" with this spherical-stylus model, but mid and mass were energetic, bouncy and punchy	5-13g Normal, MM	R	48
Nagaoka MP11 Boron £38	Average Average+	Responding well overall in PM's equipment and listening room, this model was mildly criticised for low level and dynamic limitations	5-13g Normal, MM	BB	48
Nagaoka MP10SB £40	Average Average+	Stilton's mods have improved the fine detail resolution of this popular budget model	5-15g Normal, MM	R	54
Nagaoka MP11 Gold £45	Average- Average+	There were mild criticisms directed at most areas, but in general the sound was clear, open and even	3-8g Normal, MM	R	48
Nagaoka MP11 Gold SB £70	Average- Average	Excessive price loading for a blob of aluminium	2-6g Normal, MM		54
Ortofon OM5E £15	Average- Average-	The OM10 is a hi-fi cartridge - the OM5E is not	5-16g Normal, MM		43
Ortofon VMSSE II £14	Average Average	Sound quality was thought fair for the price, though a little 'untidy'	8-18g Normal, MM		38 (Summary)
Ortofon OM10 £20	Average Average	One of the leading "cheapies", this gives a fine level of sound quality for the price, with good matching compatibility	5-15g Normal, MM	BB	48
Ortofon VMS 10E II £21	Average- Average-	Some of its stablemates fared rather better, and showed less evidence of tracking problems to boot	Normal, MM		38
Ortofon VMS20E II £35	Average Average	One of the most popular cartridges ever, sound quality was a bit laid-back and tracking could have been better	3-10g Normal, MM		48
Ortofon OM20 £40	Average Average+	This turned out to be the listening panel's favourite among Ortofon's moving magnet models	5-16g Normal, MM	R	48
Ortofon 520 £50	Average Average+	Very sensitive to load capacitance this new Ortofon maintains the company tradition for a lively, effervescent SQ	7-16g Normal, MM	R	67
Ortofon X1 £50	Average Average	The cheaper X1 scored higher marks with our listening panel than the X3, but both were a disappointment	6-15g Normal, MC		48
Ortofon VMS30E II £52	Average+ Average	Rather an old soldier in relation to turntable technology, it will perform undemandingly in demanding circumstances	5-13g Normal, MM		38
Ortofon MC10 Super £70	Average Good	"What a delightfully sweet-sounding cartridge this is..." we said	5-15g Low, MC	BB	48
Ortofon X3 £70	Average Average	A lack of bass power, definition and a "zitty" top end makes this competent but uninvolving	5-15g Normal, MC		48
Ortofon OM40 £80	Average Average+	Highly competent engineering, secure tracking and decent sound quality are major strengths. But it's a little cold, a little polite	3-8g Normal, MM		48
Ortofon 540 £100	Average- Average	Graced with an advanced FGII stylus our sample possessed too high a compliance for broad arm matching. It could also sound a little unforgiving	3-8g Normal, MM		67
Ortofon MC20 Super £170	Average+ Good+	An "inviting" sound quality, polite rather than exciting it approaches much more expensive models, but does not better them	6-15g Low, MC	R	48/Coll
Ortofon MC30 Super £250	Very Good Good+	Beautifully engineered and well-balanced, it was slightly criticised as bland, though some may appreciate the lack of rough edges	5-14g Low, MC		Coll
Ortofon MC3000 £800	Good Excellent	Quite simply, the most accurate transcription device yet created - not one for the faint hearted	6-16g V. Low, MC	R	60
RATA RP20 £22	Average- Average	Good integration, a clear dynamic midrange and the beginnings of fine stereo imagery merits clear recommendation	6-14g Normal, MM	R	48
RATA RP40 £44	Average Average+	The '40 did a good job of sorting out the layers and complexity of the mix, with good focus, excellent stereo spread and fine scale	6-15g Normal, MM	R	48
RATA RP70 £77	Average Average+	Clearer and sweeter than the '40 this also seemed heavier and less lively. For £99 you can have a van den Hul stylus	6-14g Normal, MM		43
RATA RP70vdH £99	Average+ Good	Able to retrieve bags of musical detail (thanks to the vdH stylus), RATA's top cartridge ranks as one of the most articulate MM's available	11-18g Normal, MM	R	67
Rega Bias £34	Average Average+	Difficult to mount in some arms due to its shallow build, the bias offers a gentle, refined SQ that certainly makes it worthy of audition	4-10g Normal, MM		67
Rega RB100 £38	Average Average+	Remarkable mechanical performance in the right system context, but "try before you buy"	5-12g Normal, MM	R	48

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

# THE DIRECTORY

## CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Rega Elys £74	Good Good	Clearly superior to the Bias, despite their common heritage, the Elys is both more detailed, accurate and musically convincing	8-15g Normal, MM	R	67
Revolver £20	Average+ Average	This modified AT-95E enjoys a very lively mid and treble even if the bass is somewhat 'slower' in protection. A firm budget buy	8-16g Normal, MM	BB	67
Shure M92E £15	Average- Average	Though lacking depth, the overall sound quality was competent, but treble was not its forte	10-15g Normal, MM		43
Shure M99E £26	Average- Average-	Sister to the 92E this is a solid but not particularly exciting cartridge	5-10g Normal, MM		38 (Summary)
Shure ME75ED £24	Average Average-	Rather bright and splashy in the high frequencies but nevertheless a competent model	5-10g Normal, MM		38
Shure M104E £32	Average- Average	Capable in many ways, but giving no substantial improvement over the 92E in our view	5-15g Normal, MM		38
Shure ME97HE £44	Average Average+	It won't turn a sow's ear of a turntable into a silk purse, but will at least keep going and produce an acceptable result	8-20g Normal, MM	R	48
Shure M105E £45	Average Average-	A slightly 'spitty' sound lacking deep bass and dynamic contrast, but can be used in virtually every system where it will perform "unobtrusively"	5-12g Normal, MM		38 (Summary)
Shure M110HE £55	Average Average	Sound quality was thought eminently presentable, but not exciting; smooth clear high frequencies, but a loss of bass definition	5-10g Normal, MM		38 (Summary)
Shure M111HE £67	Average Average	Early reviews of this cartridge complained principally of the price - which has since come down	5-10g Normal, MM		38 (Summary)
Shure ML120HE £95	Average+ Average+	Quite decent sound quality and a generally fine balanced performance	6-18g Normal, MM		48
Shure ML140HE £120	Average+ Good	Qualitatively the treble of this well-balanced moving magnet model was a match for many moving coil cartridges	6-16g Normal, MM		43
Shure V15 VMR £195	Good Average+	Initial listening gave promising results, but extended familiarity gave the feeling of a lack of energy and a "shut-in" sound	5-12g Normal, MM		38
Shure Ultra 500 £452	Good Good	There was no doubting the accomplishments of what could well be the finest moving magnet cartridge around	6-14g Normal, MM		48
Stilton/AT-F3 £110	Good+ Good+	At a premium of some £40 this modified AT-F3 offers a startlingly refined performance and is strongly recommended	8-18g Low, MC	R	67
Supex SM100E £115	Average Average+	Delivers as much musical information as many moving coils - the bass in particular having an attractive bounce	6-15g Normal, MM		38
Supex SD900IV £350	Average+ Good+	The 900 is an inherently fine cartridge, but despite a recent update it is beginning to show its age	10-18g Low, MC		48/Coll
Supex SD901IV £375	Average+ Good+	This high output model delivered sufficient subjective and objective performance, plus good compatibility, to justify its price tag	8-18g Normal, MC	R	48
Supex SDX2000 £651 L £721 H	Good Good+	The high-o/p 2000 was preferred on listening tests to the low-o/p model, which even so has a unique place among the top designs	6-16g Either, MC		48
van den Hul MC10 £699	Good Good+	A neutral balanced performer giving transparent midrange, fine depth and focus with firm extended bass. Gosh!	5-10g Low, MC	R	60
van den Hul MC One £699	Good Very Good	This extended all the positive qualities of the '10 but added greater authority and scale - worth it for the extra money	6-12g Low, MC	R	60
van den Hul MC Two £899	Good Very Good	Connected directly to any standard MM input the vdH MC Two rewards with a highly detailed yet fluid and musically convincing portrayal	6-13g Normal, MC	R	72

\* rating refers to original tested model

## AMPLIFIERS

The amplifier sits at the heart of the system, processing the outputs from all the various music sources as necessary and then driving the loudspeakers. These two (quite separate) functions are integrated into a single box at the low-to-middle price points; separated pre- and power amplifiers become increasingly common as one moves upmarket. At the upper end of the specialist market, valve amplifiers provide a popular alternative to the transistor types amongst enthusiasts.

There is a substantial difference between specialist (sound quality oriented) amplifiers and the consumer electronics style models. The former

are bleakly simple, avoiding all unnecessary features to provide the most direct signal path in the interests of best sound quality. The latter range from models with just basic tone controls and tape recorder switching, to those with elaborate facilities such as graphic equalisers, remote control (including volume), surround sound options etc. etc.

Lab measurement provides some useful data, particularly in regard to an amplifier's ability to drive a wide range of different types of loudspeakers, but this is only obliquely related to sound quality. We also include our measured power output (RMS, 8ohm load, 1 channel driven) - but

again, paradoxically, this doesn't necessarily correspond to the loudness capability of the amplifier, which has as much to do with the elegance of the overload characteristics within a given system (valve amplifiers invariably sound more powerful than their rating would suggest). The listing of features provides some indication to the complexity of an amplifier: many users prefer to retain the option of tone controls to 'shape' the overall sound according to taste; many others have found living without tone controls surprisingly easy, with additional benefits in terms of transparency.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research A03 £160	Average+ Average	New slimmed down version of the A04 with less power and facilities but also a slightly 'fuzzy' sound	38W, MM disc, CD direct and 3 aux inputs		74
Acoustic Research A07 £280	Very Good Average+	Relatively smooth but ineffectual sound quality that lacks some weight and impetus at very low frequencies	75W, 4 line, 2AV and MM/MC inputs		68
ADC A-2080E £400	Good+ Average+	Clean and neutral sound but one that lacked depth and spaciousness; MM input favoured above MC or CD	108W, logic sw. for 5 line and MM/MC inputs		68
Akai AM-52 £230	Average+ Average-	Basically equipped, this amplifier offers a comfortable but hardly over-detailed sound	95W, MM/MC disc, 5 line inputs, loudness		74
Akai AM-93 £550	Average Average-	Unfortunately Akai's on-board D/A converters were less successful than its conventional analogue CD input	112W, coax and optical dig inputs. MM/MC		68
A&R Arcam Alpha II £170	Good Good+	Very confident, convincingly musical and punchy sound that sets the standard for other budget amps	41W, 4 line and MM inputs	BB	68
A&R Arcam Delta 60 £260	Good Good+	Very refined and highly detailed sound via MM and CD without any of the hardness noted via the MC stage	59W, 4 line, MM/MC inputs, no tone controls	R	68
Albany M408 II £895 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

# THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

## THE DIRECTORY

## AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Albary M1008 II £1095	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
Amadeus Gold £360	Average— Good	There is some indication of instability but otherwise sounds very rich, warm and musical. High-ish IMD.	56W, MM/MC plug-in cards, 3 line inputs	R	74
Analogue Electronics PR3/PA4 £280/£280	Poor— Fair	Our samples, though certainly not prototypes, were technically compromised. Preamp sounds very bass light while the power amp sounds very coarse	29W, MM/MC, separate source and record out, recessed 4mm sockets		74
Aragon 4004 £1795	Good Good	Despite its imposing bulk the Aragon is something of a softy at heart. It can deliver oodles of power but its musical presentation is more laid-back	231W power amp		72
Arcom Delta 90.2 £350	Average+ Average+	Dark but slightly dead or conservative sounding version of the original Delta 90. Improved disc stage	73W, MM/MC, 4 line inputs, tone bypass, bi-wire	R	74
Ariston Amp £180-200	Average Average+	Slightly veiled and thin sound but proved suitably attractive in the listening tests	32W, full logic control, MM and 4 line inputs	R	68
Audio Innovations Series 300 £425	Poor Good++	Something of an anomaly the 300 is an integrated valve amp that looks awful in the lab but sounds remarkable in a system	10W, MM, 6 inputs	BB	63
Audio Innovations Series 1000/2nd Audio Amplifier £1299/2250	Poor Excellent	This valve combination offered awesome dynamic range with superb transparency and power to match. Compatibility with other brands is unpredictable	15W, MM, 6 inputs, monobloks	R	63
Audio Research SP9 £1698	Very Good Very Good	This new high performance valve FET hybrid preamplifier sets a high standard for versatility, build quality and sound	5 inputs, MM/MC	R	60
Audio Research SP11 II £5250	Very Good Excellent	Current state of the valve preamp art. A reference point	Straight line MM/MC Disc + phase invert	R	60
Audiolab 8000C £325	Excellent Good	A well established preamp with a highly controlled sound, though it could do with more life and depth	MM/MC, 5 inputs, hdph, tone controls	R	62
Audiolab 8000A £350	Very Good Good+	Exceptionally detailed, tactile and transparent via CD but slightly more clouded via disc. A stalwart design	72W, MM/MC, 4 line and full record out selection	R	74
Audiolab 8000P £495	Excellent Good+	A dynamic powerhouse, load tolerant and sonically reliable	100W	R	62
Beard Audio CA35/P35mkII £595/£795	Fair+ Very Good	Good build quality and a very smart finish combine with a characteristic valve sound to make a first class amplifier capable of giving hours of musical enjoyment	35W, MM/MC, 4 inputs	R	63
Beard 506 £1195	Good+ Good+	A versatile valve preamp – the bass sounded lively if a touch softened while the treble was detailed but lacked a little sparkle and air.	4 inputs MM/MC		50
Beard M70 £1995 pair	Good Good+	A substantial British monoblok power amplifier, but not a great deal more impressive than the P35 at half the price	70W		50
Bryston 0.5B/2B £595/£695	Very Good Good	Very rugged Canadian pre/power combo that sounds cool confident and punchy. Headamp available to suit MC cartridges	65W, MM and 4 line sources, overload LEDs on power amp	R	74
Bryston 12B/4B Pre/Power £995/£1395	Good+ Good	Bryston's massive 4B power amp stood out as the backbone of this combo, the preamp sounding a trifle unbalanced between MM and MC inputs	272W, bridgeable to 800W. 6 line, 2 disc inputs, subsonic filter		68
Cambridge Audio P40 £200	Good Good+	A very fine sounding integrated amplifier with simple facilities and MC cartridge capability	5 inputs 40W MM/MC straight line	BB	50
Cambridge Audio C75 £279	Good+ Good+	Whilst not quite on par with its A75 companion this preamp provided excellent stereo imagery but was a touch "heavy" in character	MM/MC disc	R	50
Cambridge Audio P55 £290	Very Good Very Good	A grown up P40, the P55 suffers slight noise on the moving coil input but offers great sound for the money	55W, MM/MC, 5 inputs, hdph	BB	62
Cambridge Audio A75 £299	Very Good Very Good	This strong power amplifier sounded open and effortless, with fine bass drive and dynamics, albeit a touch grainy and harsh at high frequencies	100W	R	50
Cello Audio Suite £5280	Excellent V Good/Excellent	Cello's preamp represents a whole new ball game in flexibility and sound quality (or war of attrition on your wallet)	Optional inputs MC etc	R	50
Conrad Johnson MV50 £1699	Good+ Good+	Coupled with the PV5, this CJ power amp performed well on audition	50W		Collection
Conrad Johnson Motif MC-8 £1995	Very Good Very Good	A cheaper alternative to the '7, this preamp is an undoubted success in maintaining the Motif sound but does not compare on sound quality	MM/MC	R	50
Conrad-Johnson Premier Seven £8995	n/a Excellent	Price has increased since we tested it – but at this price who cares? The 'Seven is designed without compromise, and it's clearly one of the finest (valve) preamplifiers money can buy. Absolutely gorgeous!	MM, 4 line inputs, sep. Rec Out, versatile cartridge matching	R	72
Counterpoint SA12 £1250	Good+ Good+	A real power-house power amp, beefy and load-tolerant although like the SA7 a trifle untidy at frequency extremes	100W		Collection
Creek CAS 4040 S2 £179	Good Good	More neutral than its predecessor tonally, substantial improvements in transparency were also noted, while the lively punchy, character is retained	30W, MM, 4 inputs, tone controls	BB	62
Creek CAS 4140 S2 £219	Good+ Good	Redesigned for '88, this is a fine allrounder with good moving coil input, plain presentation	40W MM/MC 3 line inputs	BB	62
Creek CAS-5050 £399	Average Good	Strong RF IMD compromises the sound of the CD input which contrasts with the delightful performance via MM/MC	72W, MM/MC, aux CD and video + pre/power mode	R	74
Croft Micro £150	Average+ Good	A real upsetter, this excellent valve preamp put the cat among the pigeons proving good sounds can be made at budget price levels	4 inputs MM straight line	R	Collection
Croft Super Micro A £500	Average+ Very Good	The looks are somewhat improved, while this 'hot rod' version with tuned components performed very well indeed. There is still no gain on the line inputs	4 inputs, MM, straight line	R	57
Croft Series IV(S) £730	Good Good	The original IV is still available now supplemented by the higher price and power (S); both are fine performers	40(60)W channel	R	57
Croft Series IVSA £1000	Good Very Good	Featuring tuned components chosen for their sound quality, the 'A' variant is an impressive example of Croft's technique in valve design	60W special supply regulation	R	57
Delttec DSP-50S DPA-50S Pre/Power £675/£825	Excellent Very Good+	Remarkable pre/power combo based around the highly linear DH-DA32 hybrid op-amp. Unmatched detail resolution, control and transparency	63W, external feedback wiring, 3 line, MM/MC no tone controls	R	68
Delttec DPA 100S £2200	Very Good Very Good	A top-quality transistor power amp, sounding fast, articulate and well controlled, though maybe a touch clinical for some tastes	80W	R	50
Denon PMA 250 II £125	Good Fair	Despite a claimed increase in power this competent model now slips behind the competition on sound quality grounds	30W, MM, hdph, tone controls		62
Denon DAP-2500 PDA-4400A Pre/Power £549/£599 pr.	Very Good Good	Denon's fully-fledged preamp also incorporates D/A converters that did not improve the sound of our £299 CD player. The power amps are brill!	172W, monobloks Opt/Coax dig + 2 tape, 4 line and MM/MC inputs		68
Denon PDA-6600 £1,000/pair	Excellent Very Good	Delivers abundant high quality sound, solid engineering expertise and content clearly compensating for any compromising of purist audiophile principles	250W monoblok, remote power	R	60
DNM 3A From £1000	Good+ Very Good	The DNM3 in its acrylic case is a remarkably revealing and neutral state of the art preamp	5 inputs MM/MC twin vol controls	R*	44

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



# THE DIRECTORY

## AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
E.A.R. 802/509mkII £920/£1550	Average Very Good	Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100W, MM, 6 inputs, monobloks	R	63
E.A.R. 549 £3,000/pair	Very Good Very Good	A valve monoblok that measures like a solid state amp is itself an achievement, but exceptional power delivery and bass 'slam' is not fully matched by delicacy and transparency elsewhere	200W monoblok, bias setting		60
Exposure VII/VIII £360/£340	Very Good Good	Supplied as a combination without the separate preamp power supply, this pre power combination performed satisfactorily especially on the moving coil input	50W, MM/MC, 3 inputs, straight line		62
Exposure VI/VII Dual/VIII Pre/Power £449/£219/£379	Good Very Good	An established company like Exposure could do more to improve the 'look' of these amps which, nevertheless, sounded confident, dry and musical	63W, Super mod. 4 line and 2 disc inputs with full rec-out switching	R	68
Grant 660AMS £948 pr.	Good Very Good	This neat and compact 60W valve monoblok gave good sound on the 8ohm tap, better still on 4ohms. The midrange was particularly natural	60W monobloks 8ohms	R	57
Grundig A-9000 £650	Good+ Average-	Very large integrated design culled from Marantz, however is far too expensive to be fully competitive	153W, MM/MC, full record out selection		74
Hafner DH120 kit form £325	n/a Fair	We didn't build one, see below	60W		44
Hafner DH-110/XL-600 £360/£995	Very Good Very Good	Preamp is available in kit form. Both sound remarkably open, transparent and inherently 'musical'. XL-600 is tremendously powerful and very compatible	426W in stereo mode, 1.5kW in bridge, 2mm, tone + processor loop	R	74
Hafner DH120 assembled £396	Very Good Fair	Sound quality results were decent enough, but this power amp won't set the world on fire at this price	60W		44
Harman Kardon PM635i £159	Good Good	An improved version of the classic PM635 amp which sounds typically dry and articulate. Price is frozen	49W, 4 line and MM inputs A/B speaker o/p	R	68
Harman Kardon 640 Vxi £225	Good+ + Good	Moderately priced but built to HK's high standards, good value and good load tolerance	50W MM, 5 line inputs tone controls		56
Harman Kardon PM645Vxi £300	Very Good Good	Fits in well with the Harman Kardon series, giving a competent all round performance at a fair price	75W, MM/MC, 5 inputs, hdph, tone controls		62
Harman Kardon PM650Vxi £369	Average+ Good	A tight and slightly over-damped sound lacks any essential warmth or richness. Reduced headroom on MC	71W, 6 line, MM/MC and true A/V inputs		68
Harman Kardon 655 Vxi £449	Very Good Good	Plenty of well built integrated amplifier for the money, with lots of power to drive almost anything, plus versatile inputs	100W MM/MC 6 line inputs tone controls		56
Harman Kardon Citation 25/22 £599/£859	Good Average+	Not as outrageous as previous Citation amplifiers but neither as punchy nor exciting in the sonic stakes. A good all-rounder but lacks sparkle	138W, MM/MC full range of input and record out		74
Harman Kardon 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
ITL MA-80 £169	Good Good	A promising start for this young company, the MA-80 gave a fine sound with CD but was less wonderful on the moving coil input	30W, MM/MC, 5 inputs	R	62
Jadis JP30/JA30 £7,425	Fair Excellent	Two-box preamp plus monoblok power amps, classic valve design gives stereotype valve sound. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at frequency extremes, n lab, and re cartridge matching	30W 2-box pre-, monoblok power, MM-only, 4 line inputs	R	60
Jeff Rowland Coherence One/ Model 7 £3750/£4950 each	Very Good Very Good	The technical design of these amps is very elaborate but ensures they achieve an extraordinarily transparent and potent sound. However, the CD i/p is clearly superior to the disc inputs	448W monoblok MM/MC with variable loading options. Balanced topology	R	72
JVC AX-222 £110	Good Fair	Not very impressive, JVC need to pull their socks up if their budget amplifiers are to score	35W, MM, 4 inputs, hdph, tone controls		62
Kelvin Labs Absolute Zero/M30 £395 + £295/£595pr.	Good+ Average+	Latest versions of the M30 offers a true 30W Class A and a slightly muddled but very comfortable sound. MC preamp is a very linear design	33W monoblok MC only + 4 line inputs. Separate L/R balance	R	74
Kenwood KA-550D £120	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
Kenwood KA-5010 £210	Good Good	Offers a slightly bass-light but very smooth, fresh and alive sound. Well built and sensibly equipped	101W, MM/MC, CD 3 tape, tuner, aux + direct	R	74
Kenwood KA-7010 £300	Average+ Average+	More powerful version of the 5010 but less successful in the listening tests. RF MD is the likely cause.	123W, as above plus -20dB mute facility		74
Klyne SK5a £2590	Very Good Very Good	Beautifully made and presented this American thoroughbred has a good lab performance, but although versatile, is rather expensive for the quality of sound offered	Balanced output, versatile cartridge loading		72
Krell KSA-200 £5050	n/a Very Good	Value derives partly from excellence of sound, but equally from imperturbability, flexibility, consistency, build and after sales care	200W	R	72
LFD £2,995+	Very Good Excellent	Can set the subjective standards that others merely aspire to, but this outstanding if unconventional multi-box preamp needs careful matching to ancillary components (cartridge, power amp)	MC (with care), passive line extra	R	60
Linn LK1/LK280 Pre/Power £495/£645	Good Good-	A very modern, logic-controlled amp with distinctive and inoffensive sound quality. Its restrained sound could do with extra insight and zip	84W, compact amp CMOS sw. for 2 tape, 2 line and MM/MC. XLR sockets.		68
Marantz PM25 £129	Good Fair	Soft and sweet like the rest of the range, the PM25 is inoffensive and undemanding	35W, MM, 5 inputs, hdph, tone controls		62
Marantz PM35 £149	Very Good Good	This new generation Marantz is a good allrounder, and shows that extra care is being taken over sound quality, well equipped and versatile	45W MM/MC 3 line inputs tone controls		56
Marantz PM45 £200	Good+ Fair	Generally pleasant and polite with above average clarity, there was some softening in the bass, restricting dynamic output somewhat	40W MM/MC tone controls		50
Marantz PM-65AV £250	Average+ Fair	One of the few amps to actually sound worse via CD direct! Unbalanced character but packed with AV inputs	82W, MM only wide range of aux/video		74
Marantz PM-75 £449	Good Average	More successful than most amps with on-board DACs but still not as balanced as other Marantz products	136W, opt/coax dig inputs, 6 line + MM/MC		68
Marantz PM94 £1,000	Very Good Good	At 23kg the PM94 is no lightweight in either physical or sonic respects. A very powerful and comprehensively equipped amplifier	140W MM/MC tone controls (switchable)		60
Marantz PM-95 £1,900	Very Good Average+	Beautifully constructed, this amp was less convincing via its digital i/p than via line. Class A option best suited to sensitive speakers. Costly	151W with 30W available in Class A Opt + coax inputs		74
Meridian 201/205 £599/£425 each	Very Good Good+	A fine preamp with additional luxury option of full system remote, plus competent and attractive monoblok power amplifiers with generally good performance	100W MM/MC 6 line inputs remote capable straight line	R/—	62
Mission Cyrus One £180	Very Good Good	A red hot class winner, which caused the whole issue to be re-rated! It's even well built - however, the headphone socket will only take a 3.5mm jack	30W, MM/MC, 5 inputs, hdph, straight line	BB	62
Mission Cyrus PSX £230	Very Good Very Good	The PSX does make the Cyrus Two sound better, and also improves the PCM II CD player giving more wallop and clarity	Auxiliary power supply	R	62
Mission Cyrus Two £300	Very Good Very Good	Also a top performer in its group with fine moving coil and compact disc sound. Again, only 3.5mm headphone socket	50W, MM/MC, 5 inputs, hdph, straight line	R	62

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

## THE DIRECTORY

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>Mordaunt Short MS-A5000</b> £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, hdp, tone controls	R	62
<b>Musical Fidelity A1</b> £269	Good Good++	Fine-ranking in terms of overall sound quality for money, the excessive heat output could be hazardous to your vinyl if you're careless	20W MM/MC 4 inputs straight line	BB	56
<b>Musical Fidelity B200</b> £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
<b>Musical Fidelity 3A-X/MA100-X</b> £379/£1,499pr.	Average Very Good	Power amps get extremely hot as a result of Class A operation. Sounds exceptionally rich, lush and effortlessly musical. Lacks transparency	105W, MM/MC + 4 line inputs, passive line out bi-wire option	R	74
<b>Musical Fidelity Pre 3/P140</b> £379/£349	Very Good Very Good	Delivering true audiophile sound quality well ahead of their price, both components shine in their own right	70W MM/MC 4 line inputs straight line	R	56
<b>Musical Fidelity A100</b> £459	Good+ Very Good	This is another one recommended for fine sound with which you could keep your Chinese carry-outs warm	50W MM/MC 5 inputs straight line	R	62
<b>Musical Fidelity P170</b> £599	Very Good Very Good	Acquitted itself well, later samples showing steadily increasing refinements	85W	R	50
<b>Musical Fidelity MA-50</b> £875 pair	Good Excellent	An audiophile bargain. One of the best sounding power amplifiers made	50W, monoblok	R	62
<b>Musical Fidelity MVT Mk 3</b> £1199	Very Good Very Good	The MVT preamp was "strong in its class", providing competition for £1500-plus amplifier systems, now rivalled by the MF 3B	MM/MC 5 inputs	R	50
<b>Musical Fidelity P270</b> £1299	Very Good Very Good	If the hot-box aspect is not a deterrent, this is something of a bargain. A big amplifier scale of sound which is just a little rough-edged	135W	R	50
<b>Musical Fidelity MVX &amp; A370</b> £2300/£2299	n/a Excellent	In its latest guise, the A370 confirms its status alongside the MVX as amongst the best indigenous components for both sound and presentation	MVX - MM/MC/4 line/phase invert. A370 - 150W	R	72
<b>NAD 3020e</b> £130	Good Fair	A little light in balance and "weight" but superior to run-of-the-mill budget amplifiers	20W MM/MC 4 inputs	R	50
<b>NAD 3225PE</b> £150	Average+ Average+	Light and detailed if not as rich or weighty sounding as others. MM input sounds warmer than CD	42W + 70W dyn. headroom; soft-clipping, MM only	R	68
<b>Naim NAIT 2</b> £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
<b>Naim Separates</b> £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
<b>Nakamichi CA-5E</b> £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, hdp, tone controls		62
<b>Nakamichi PA-5E</b> £1150	Very Good Good	A strong sound in several respects but one which ultimately failed to satisfy	100W		62
<b>Nakamichi CA7E/PA7E</b> £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
<b>Nuance</b> £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
<b>NVA AP30mc</b> £290	Average+ Good	Utilitarian in appearance but offers a very refined and beguilingly musical sound quality on MC and line	22W only, MC or MM options, 3 line inputs	R	68
<b>Oakley Image</b> £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
<b>Orell SA-040</b> £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
<b>Philips FA-880</b> £200	Good Average	A new and cheaper design from Philips that sounds best via MM disc. Can appear soft and unbalanced via CD	108W, MM/MC source-direct tone		74
<b>Philips FA960 MkII</b> £299	Good+ Average	The MkII '960 still failed to grasp our listeners' attention but it remains a competent amp nonetheless	122W, 6 line & 2 disc inputs + tone controls		68
<b>Philips DFA-888</b> £300	Good Average	As above but including a modified disc input and onboard DAC. Sounds tight but also slightly thin	107W, as above + opt and coax digital inputs		74
<b>Pink Triangle PIP</b> £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
<b>Proton 520</b> £100	Average Average	Very well equipped budget amp with a slightly flat and undynamic sound - acceptable at the price though	31W, MM/MC with variable MC gain, 4 R line inputs	R	74
<b>QED A240 CD II</b> £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
<b>QED A240 SA II</b> £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
<b>QED A270</b> £329	Good- Good+	Building on the strengths of the '240, the '270 sounds weighty, fast and dynamic. A bit 'lumpy' via MC	51W, 5 line and 2 disc inputs, pre-out	R	68
<b>Quad 34</b> £285	Very Good Fair	This well-built durable preamp has useful filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4 inputs MM/MC tone controls		44
<b>Quad 405</b> £349	Very Good Fair	Not an impressive power amp but easy on the ear if not pushed and very reliable	100W		44
<b>Radford SC25</b> £862.50	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
<b>Radford MA75</b> £977.50	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
<b>Radford STA25 Renaissance</b> £1115.50	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
<b>Revox B150</b> £875	Very Good Average+	Beautifully constructed but hampered by Revox's convoluted logic control. Open and smooth sound. Still costly.	117W, CMOS sw. for 3 line, 2 tape and MM		68
<b>Revox B250</b> £1188	Very Good Good	With much improved sound over its predecessors plus amazing remote control facilities, this could form the heart of a round-the-dream-house system	150W MM/MC system/house remote tone controls		56
<b>Rose RV-23</b> £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
<b>Rotel RA810A</b> £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, hdp, tone controls	BB	62
<b>Rotel RA820A</b> £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

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

# THE DIRECTORY

AMPLIFIERS						
NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW	
<b>Rotel RB/RC850</b> £150/£125	Good++ Good+	Quality separate pre and power amplifiers at near budget integrated amplifier prices. A notable achievement	60W MM/MC 4 line inputs tone controls	BB	62	
<b>Rotel RA820BX3</b> £170	Very Good Good	The latest upgrade is not that impressive, but the BX remains a fine amplifier and now has a moving coil disc input	30W, MM/MC, 5 inputs, hdph, straight line	BB	62	
<b>Rotel RC-870BX/RB-870BX Pre/Power</b> £199/£210	Excellent Good+	Reduced price makes the 870 combo better value but, despite mods to the preamp, it is the power amp that must take the lion's share of credit	128W or 208W in bridged mode. CD direct, 4 line, 2 tape and MM/MC	R	68	
<b>Rotel RA840BX3</b> £220	Very Good Good+	Requires a very long warm-up period but rewards with a refined sound that should suit 'lively' systems	59W, 2 tape, 2 line, MM/MC and A/V inputs	R	68	
<b>Rotel RA870BX</b> £300	Very Good Good+	A powerful blockbuster with solid and well focused sound, good versatility and fine load tolerance	85W MM/MC 7 line inputs tone controls	R	56	
<b>SAE P102/A202</b> £499/£599	Average+ Average+	Microprocessor-controlled pre and power amp that sounds much better at low rather than high volume levels. Pro-oriented aesthetics	151W, MM/MC + CD tuner and 2 tape tone memory, spk switching		74	
<b>Sony TA-F200</b> £130	Average- Average	Over-ambitious protection circuit is hardly in keeping with modern amp design. Lean but 'dead' sound quality	74W, 2 tape, 3 line and MM/MC inputs		68	
<b>Sony TA-F400</b> £200	Good Average+	Some lack of integration across the frequency range but still offers a more open and detailed sound than the F200	76W, 2 tape, 3 line and MM/MC inputs. Rec-out		68	
<b>Sony TA-F530ES</b> £300	Good Average+	Chunky UK-oriented design that offers a rich, smooth and full sound. Slight loss of focus via MM/MC disc	120W, MM/MC, 4 line sources + record out + tone	R	74	
<b>Sony TAF 500ES</b> £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	
<b>Sony TA-F630ESD</b> £350	Good Average	Based on the '530 but equipped with PDM/D/A convertor. Amp is competent but DAC sounds truly magnificent!	130W, as above + opt. and coax digital inputs	R	74	
<b>Sony TAF 700ES</b> £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	
<b>Sumo Nine +</b> £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	
<b>Sumo Andromeda</b> £1585	Very Good Very Good	Well made with lots of power from a sensibly sized box. It was good in the lab and demonstrated a sound which offers a fine blend of performance at an almost reasonable price	200W, balanced input	R	72	
<b>Tannoy SR-840</b> £1713	Very Good Good	A "muscle" power amp, capable of impressive levels into difficult loads while remaining quite subtle and revealing	250W		50	
<b>Technics SU-V660</b> £250	Good Fair	Chunky build but integrated output stage infers a weak, insubstantial and rather monophonic sound	107W, MM/MC, CD aux, tape + tuner + power amp-direct		74	
<b>Technics SE-M100</b> £550	Very Good Good+	An unusual disc-less poweramp with volume control. Standard line input sounds very open and clean. Digital input is harsher and less convincing	123W, coax and opt digital inputs, var and direct CD no MM or MC disc	R	74	
<b>Vacuum State FVP</b> £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	
<b>Yamaha AX-300</b> £100	Good Fair	A lively and dynamic performer, offering a credible if bright sound at a competitive price	30W hdph tone controls (MM)		50	
<b>YBA Model 3 Pre/Power</b> £995/£995	Good Good	Suited to highish sens. loudspeakers this duo produced see-through, ethereal stereo images that were more convincing towards the centre of the soundstage than at the edges	56W stereo amp MM only with 3 line i/p's. Separate L/R volume controls		72	
<b>YBA 2 pre &amp; pwr</b> £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	
<b>YBA 1 preamp</b> £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	
<b>YBA 1 power amp</b> £2995	Good Excellent	This equally well finished power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85W	R	62	

\* rating refers to original, tested model

## LOUDSPEAKERS

Last item in the hi-fi chain, to some extent the loudspeaker is merely the slave of what has gone before, capable only of reproducing a signal as good as it is fed. Nevertheless the distortions (colorations and stereo effects) introduced by loudspeakers (and rooms) tend to be more immediately obvious than those anywhere else in the chain, so careful choosing according to taste is very important.

The average loudspeaker consists of a smallish enclosure, much of which may have begun life as

part of a tree, plus a couple of drive units hidden behind a removable grille. Inside the box lurks a simple electrical circuit known as a crossover, which divides the incoming (full range) signal into the right bits for the drivers to handle. Variations on the above formula are specifically identified in the entries. The designer's primary task is to balance the sensitivity of the loudspeaker (how loud it goes for a given electrical input) against the bass extension (how low does it go) for the given box size. After that such subtleties as coloration and

dispersion come into the equation

Careful placement of the loudspeakers within the room is as important as the initial choice of model. For good stereo they need to be more or less the same distance from nearby walls, and preferably on similar rigid stands. The listener should be about the same distance from and listening angle to each loudspeaker. The ideal placement depends on the way a particular model has been balanced (not to mention a number of other factors), and our recommendation is given in the entries.

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
<b>Acoustic Energy AE1</b> £696	Good Very Good	To the author's knowledge, the most awesomely dynamic and articulate miniature ever made	29.5 x 18 x 25cm semi-open space	88dB/W 60Hz	R	59
<b>Acoustic Energy AE2</b> £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
<b>Acoustic Energy AE4</b> £1880 (stands £550)	Good Good	Magnificent but also seriously flawed, the AE4 possesses tremendous dynamic realism but a very mid-dominant balance. Large rooms and wallets only need apply	54 x 32.5 x 44cm own stands in free space	90dB/W 40Hz		71
<b>Acoustic Research Red Box</b> £99	Average Average	Lively and balanced if a bit crude and uneven, this under-£100 econobox succeeds partly because of its simplicity, and works well with some rear wall assistance.	32 x 19.5 x 17cm close to rear wall	87dB/W 85Hz	R	74
<b>Acoustic Research AR112</b> £125	Average Average-	Nicely presented and engineered, but sounds a bit small and boxy without true coherence.	36 x 19 x 18.5cm stands near rear wall	87dB/W 75Hz		66
<b>Acoustic Research AR122</b> £150	Average Average	Despite a promising enough list of ingredients, the 122 failed to excite real enthusiasm amongst the listening panel!	38.5 x 19 x 22cm stands near rear wall	87dB/W 68Hz		68
<b>Acoustic Research AR132</b> £200	Average+ Average-	Good presentation and detail engineering was not sufficient to counter bass heavy balance problems on auditioning	44.5 x 23 x 25.5cm stands 1ft from rear wall	87dB/W 50Hz		66
<b>Alexander 514</b> £139	Average- Average-	If you must settle for overgrown headphones, these may be your best bet, but don't expect miracles from this too tiny box.	22 x 11 x 9.5cm close to rear wall	82dB/W 90Hz	R	74

# THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



## THE DIRECTORY

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Alexander 566 £159	Good— Average—	Unusual shape, metal-jacket miniature that works well within limited dynamic range capability; needs free space siting.	40.5 x 11 x 16 narrow stands in free space	83dB/W 70Hz		71
Alexander Aurora £379	Average Good—	The unusual metal case and slim shape of this grown up miniature provide welcome diversity. It sounds pretty good too	42.5 x 14 x 19cm matching stands in free space	85dB/W 55Hz		66
Allison CD6 £290	Average Good—	An unusual cube-shaped model designed for wall mounting gives exceptional bass extension from a small box, though it's also a bit heavy, coloured and slow	28.5 x 28.5 x 28.5cm stands against rear wall	88dB/W 45Hz	R	71
Alphason Orpheus £800	Good Good+	Large hi-tech two-way features unusual, sweet-sounding isodynamic tweeter; well engineered and balanced if a shade odd in appearance	65.5 x 28 x 34cm stands near rear wall	87dB/W 43Hz	— R	71
Apogee Scintilla £4990	Good Very Good	These take-me-to-your-leader speakers gave exceptional transparency and can achieve excellent results in a true audiophile system	145 x 88 x 9cm free space on floor	79dB/W 20Hz	R	46
A&R Arcam Three £149	Average+ Average—	Arcam's baby speaker did not delight our listeners, but it might do better in less expensive systems	34 x 18 x 23cm close to wall at head height	88.5dB/W 95Hz		53
A&R Arcam Two £270	Good Average	Most things to most men this compact is unlikely to disappoint with its lively "ballys" character though lacking weight... a bit	38 x 23 x 28cm near wall shelf or 40cm stands	88dB/W 55Hz		59
A&R Arcam One Plus £359	Good Average	Provides a solid, weighty and rich sound, but is a little raw in the treble and indefinite in the midband	22.3 x 28.1 x 37.8cm open space, on stands	88.5dB/W 60Hz		59
Ariston Image £159	Good Average	Good engineering content at a reasonable price, the Image delivers fine stereo with low coloration, but sounded too bassy under our listening conditions	42 x 22 x 27cm stands in free space	87dB/W 55Hz		66
Audio Electronics TC10 II £599	Good— Good+	Oddball appearance is rescued by a respectable technical performance, interesting and impressive engineering and fine sound quality at a realistic price.	70 x 33.5 x 33.5cm low stands in free space	87.5dB/W 40Hz	R	68
Avance 120 £279	Average+ Average+	This unusual "after eighties" looking speaker has the recipe for success, but not quite the right seasoning yet	42 x 30 x 30cm 30cm from wall on 40cm stands	86.5dB/W 60Hz		53
B&W DM550 £149	Good+ Average—	Beautifully presented, well engineered near-miniature with precise sound but a distinct lack of 'whelie' Ideal for considerate flat dwellers	35 x 20.5 x 22.5cm stands in free space	86dB/W 70Hz		71
B&W DM560 £200	Average+ Average—	Fine cosmetic presentation and good engineering for the price; overload protection may be handy but listening panel was underwhelmed	49 x 23.5 x 30cm stands in free space	88dB/W 55Hz		66
B&W LM1 Mk II £249	Average+ Average	Probably one of the best 'micros' ever made, worth considering for special applications (boats or vehicles). Upgraded since our review	24 x 15.5 x 20cm shelf or flush mount	86.5dB/W 80Hz		31*
B&W CM1 £345	Good Average	Cleverly thought out luxury design package is also fundamentally well engineered, if a shade pricey on 'sound for pound' basis	24.5 x 16 x 22cm close to rear wall	84dB/W 90Hz		74
B&W DM1600 £369	Good Good	Crisp, dynamic loudspeaker with tight but not especially deep bass and a tweeter that sometimes sounds overcooked	49 x 23.6 x 30cm free space, open stands	87.5dB/W 60Hz	R	59
BLQ Q2 £275	Average— Average	Nearly a good loudspeaker, the basic balance is good, but the midband is very uneven and there are severe losses of resolution, "space" and dynamics	43 x 25.1 x 24.5 semi open on stands	87.5dB/W 70Hz		59
Bose Interaudio 3000XL £140	Average Average—	Lots of perceived value and well enough balanced, but low cost cabinet and driver engineering results in a crude and unsubtle sound	46.5 x 29 x 23cm stands in free space	89dB/W 45Hz		71
Boston A4011 £120	Average Average—	Competent performance for size and price but below average relative to the UK competition	34 x 21 x 20cm on stands near wall	88.5dB/W 63Hz		41
Canton Plus S £140	Average Poor	Bright treble and virtual absence of any bass at all is too high a price to pay for an almost invisible loudspeaker	20 x 12 x 12cm against rear wall	87dB/W 130Hz		74
Canton Karat 20 £300	Good+ Average+	Very prettily finished and accomplished near-miniature, the bright-sounding '20's only difficulty lies in justifying its high price	34 x 22 x 20cm stands in free space	87dB/W 55Hz	R	71
Canton Karat 40 £550	Average Average	Pretty and compact three-way for those who mourn the passing of the loudness control - definitely errs on the boom n' tizz side	50 x 27 x 27cm stands in free space	88dB/W 50Hz		71
Canton 60 Karat £630	Average+ Good	Looks a bit of a throwback designwise, but is nicely presented and has a lively, dynamic and generous sound	58 x 31.5 x 31cm stands in open space	90dB/W 48Hz	R	66
Castle Clyde £149	Average+ Average	A tidy little performer packing punch, but beginning to show its age in the light of new competition	37 x 21.5 x 22cm open space on stands	89.5dB/W 64Hz	R	46
Castle Durham £199	Average+ Average	Listening results were encouraging, well engineered and finished, but lean on treble and a bit weak on bass; still recommended	41 x 21.5 x 25cm near rear wall	89dB/W 67Hz	R	46
Castle Pembroke £309	Good Average+	Comfortably recommended, a sweet smooth sound with good overall balance of engineering-based performance	55 x 37.5 x 30.5cm open space on stands	88dB/W 46Hz	R	31
Castle Warwick £169	Good Average—	Excellent presentation and fine engineering with overload protection, but a sonic disappointment in bass and dynamic qualities	46.5 x 25 x 23cm stands 1ft from rear wall	88dB/W 50Hz		66
Celef Cirrus £180	Average Good	It's nice to see Celef back in the UK, with this decent sounding small reflex box that seems unusually tolerant of siting	39 x 20.5 x 23cm stands in free space	84dB/W 60Hz	R	66
Celef CF2 Nimbus £230	Good— Good—	Nicely balanced overall but a little uneven with it, this lively and dynamic large bookshelf model came close to Recommendation	46 x 25.2 x 24cm stands in free space	88dB/W 55Hz		71
Celestion DL6 Series Two £149	Good Average	Good tonal colouring and plenty of bass for the enclosure size; the metal dome tweeter is excellent, but bass and mid lack clarity and 'bite'	45.4 x 24.5 x 26.2cm near wall, on stands	87dB/W 65Hz		59
Celestion DL8 Series Two £199	Very Good Good	A refined middle market speaker has a smooth but slightly dull quality, with good definition and deep, if slightly boxy bass	50 x 27.5 x 27.8cm open, stands	87.5dB/W 60Hz	R	59
Celestion SL12Si £580	Average Average	Careful setting up does reveal elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling	53 x 20 x 27cm matching stands clear of walls	85dB/W 50Hz		66
Celestion SL600Si £799	Good+ Good	This Aerolam high tech miniature has certain remarkable qualities that some will find irresistible, and which go a long way towards justifying the highish price. Needs careful system and room matching.	27 x 20 x 23cm matching stands in free space	82dB/W 52Hz		68
Celestion SL700 £1349 inc stands	Good Good	Very sophisticated, mostly smooth and accurate transducer, with fast but not very deep bass and a rather bright treble	37.5 x 20 x 23.5cm free air on tall stands	83dB/W 45Hz		60
Celestion 6000 £1470	Very Good Very Good	A genuine fullrange audiophile quality speaker system - with Star Wars styling to suit a high tech environment	Complex, on floor in free space	82.5dB/W	R	60
Chameleon 500 £349	Average— Average—	Sounding badly coloured, dull and compressed, it is also amateurishly constructed, despite using good quality materials	38 x 25.3 x 31.3cm free, stands	89.5dB/W 75Hz		59
Duntech PCL500 Marquis £3500	n/a Very Good	Better value for money than the Crown Prince - and arguably more dynamic, with real bass 'slam' - but a little less refined in the higher registers	147.5 x 27 x 40 free standing away from walls	92dB/W 48Hz	R	65
Duntech PCL1000 Crown Prince £6120	n/a Very Good+	Immensely "listenable", refined sounding speaker capable of creating lifelike musical images. Not overly transparent to source, but very civilised nonetheless	180 x 30.5 x 43.5 free standing away from walls	90dB/W 42Hz	R	72
Energy 22 Pro Monitor £600	Good Good	Presentation is a bit rough for the price, but this Canadian entrant is an impressive sonic allrounder that will appeal to most listeners	62.5 x 27 x 30cm stands in free space	87dB/W 40Hz	R	66
Gale 301 £300	Average Average+	Of unusual, distinctive appearance this produced a mixed response, being lively but lacking depth	44 x 23.5 x 22cm on stands quite near wall	86.5dB/W 63Hz	*	46

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



# THE DIRECTORY

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Gale GS402 £700	Average+ Average+	Clean but rich and powerful bass; stereo focus was not a strong point, but it is worth considering. (Recent revisions not yet checked)	61 x 35.5 x 28cm on matching stands near wall	88dB/W 48Hz	-	46
Goodmans Maxim Two £90	Average+ Average	More wham-bam-thankyou-mam sound that imitates much bigger speakers when you let these babies yell. (A well-controlled yell)	26 x 17 x 19cm near wall on shelf or stand	86dB/W 85Hz	BB	59
Goodmans Point 3 £100	Average+ Average-	Recommended as good value for money, but our listeners' differing opinions mean your ears should judge for themselves	47 x 25 x 20cm shelf/high stand near wall	90dB/W 80Hz	R	53
Goodmans Sterling Point 5s £139	Good- Average-	Looks a remarkably good deal with apparently good engineering, but the room drive's mid-dominant and the sound is loud but not that likeable.	56 x 29 x 26cm stands in free space	89dB/W 60Hz		71
Goodmans Point 7 £180	Average+ Average	Basically competent performance-mix and a lot of speaker for the money, but a certain lack of refinement nonetheless	69 x 33 x 26cm free space on 35cm stand	89dB/W 47Hz		53
Harbeth LS3/5A £330	Good Average	Still a classic miniature, though not to every taste, and none the better for the recent update under our listening conditions. Limited dynamic range	30.5 x 19 x 16cm stands in free space	81dB/W 60Hz		66
Harbeth HL Compact From £499	Very Good Average	The clean and neutral sound lacks resolution and gives rather unobtrusive though well differentiated stereo. Can be bi-wired to advantage	52 x 27.2 x 28.1cm open space, on high stands	87.5dB/W 65Hz		59
Heco Interior 90S £129	Good Average-	Neatly finished and engineered miniature, but the disappointingly 'lifeless' sound left the listening panel decidedly underwhelmed	27 x 18 x 16cm on high stands	87.5dB/W 90Hz		74
Heco Interior 430s £399	Good Good-	This tall floorstanding enclosure delivers an impressively even sound balance with good bass extension, if not the lively dynamics to satisfy enthusiasts	85 x 24 x 27.5cm free space	88dB/W 43Hz	R	71
Heybrook Point Five £129	Average Average	Disappointingly prosaic performance on listening tests; wooden and hollow, with restricted dynamics and 'space'. Earlier samples sounded better	37.5 x 23 x 23cm near wall, on matching stands	86dB/W 65Hz		59
Heybrook Point 7 £169	Average Average	Physically an attractive package, but not entirely convincing in lab or listening panel test; interesting for all that	40.5 x 23 x 23cm stands against rear wall	85dB/W 60Hz		68
Heybrook HB1 £189	Good Average+	No longer an over-bright character, a strikingly clear sound and fine transient performance now merits recommendation	47 x 29 x 23cm on stands near wall	88dB/W 61Hz	R	46
Heybrook HB100 £249	Average+ Good	Well matched for wall siting, the HB100 is a lively and informative performer in the tradition of the popular HB1	47 x 26 x 28cm stands near rear wall	86dB/W 50Hz	BB	66
Heybrook HB200 £369	Average Average	This luxury successor to the HB2 is lively and informative, but sounded insufficiently balanced to convince our listening panel	46 x 23 x 26cm stands against rear wall	87dB/W 55Hz		66
Infinity RS2000 £130	Good Good+	Fast, detailed and assured miniature with quick but not very deep bass. The top end's detailed but sometimes jangly	36.2 x 22.5 x 20cm near rear wall, high stands	91.5dB/W 70Hz	BB	59
Infinity Kappa 6 £725	Good Good	Interestingly styled US loudspeaker has unusual high tech drivers and good neutrality, but the sound seriously lacks excitement	63 x 38 x 24cm stands, free space	85dB/W 35Hz		66
Infinity Kappa 8 £1650	n/a Good++	Very nicely made and unobtrusive but large four-way speakers which have a tendency to sound bass heavy unless used with solid core cables	118 x 51.5 x 17.5cm floor standing, open space	89dB/W 33Hz		72
Jamo Concert 2 £240	Good Average-	A thoroughly respectable 'bookshelf' performer that needs free space siting but includes attractive cabinetwork and a neat grille	41 x 24 x 25cm stands in free space	85dB/W 48Hz		66
JBL TLX12 £149	Good- Average	This smart near-miniature has a 'boppy', lively bottom end, but beware of the fizz in its <b>!</b>	37 x 23 x 23cm stands 0.5m from rear wall	87dB/W 55Hz	R	71
JBL LX44 £340	Good- Average	This generously built model offers good power handling, bass extension and dynamic range, but suffers from the 'three-way syndrome', with middle muddle	58.5 x 30 x 29cm stands in free space	89dB/W 40Hz		71
JBL L 60T £449	Good+ Good	Well balanced and offering realistic value for money, the fine treble and extended bass make it suitable for larger rooms	78 x 30.5 x 26.5cm low stands or floor	88dB/W 40Hz	R	46
JPW Sonata £99	Good Average+	Well balanced and integrated, this near-miniature offers fine sound if limited bass and dynamic range, plus real tree wood at a nearly silly price	32 x 23 x 20cm stands near rear wall	86dB/W 55Hz	BB	71
JPW P1 £125	Good Average+	Honest and basically articulate if not very sophisticated, resolution is good but it can sound a little wearing in bright systems or with rough sounding material	44 x 25.9 x 26.1cm free space on stands	89dB/W 60Hz	R	59
JPW AP2 £145	Good Good	Few grounds for criticism but purchasers should check out the treble qualities to avoid hammering the ear anvils	46 x 26 x 25cm 40cm from wall on 45cm stands	89dB/W 65Hz	R	53
JPW AP3 £210	Good Average+	Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52 x 25 x 29.5cm near wall on stands	90dB/W 57Hz	R	46
KEF C15 £99	Good Average	One of the tiniest around delivers a surprisingly 'big' and well balanced sound, with excellent stereo from free space siting	26.5 x 18 x 14cm stands in free space	85dB/W 60Hz	R	71
KEF C75 £349	Good Good	Compact floorstanding model's Uni-0 driver provides fine crossover integration, giving stable stereo and fine dynamic range within a slightly 'rich' balance	72 x 24.5 x 25.5cm floor in free space	90dB/W 45Hz	R	71
KEF R102 £365	Very Good Very Good	High class near-miniature with expressive, articulate midband and clean, accurate bass and top. The sound quality of the Kube circuitry, however, is suspect; what would an audiophile Kube sound like?	33 x 20.7 x 26.3cm near wall or open on stands	89.5dB/W 60Hz	R	59
KEF 103/3 £680	Good+ Good	Technically impressive, excellent bass/power handling for size, but not for the audiophile system. Better among cheaper components, and good in a large room	56 x 27 x 30cm supplied stands free space	90-95dB/W 35Hz		53
KEF 104/2 (inc KUBE equaliser) £895 (£994)	Very Good Good++	A reference point for dynamics, preferred without KUBE, suited to many rooms. Good stereo, high sound levels	90 x 28 x 41.5cm floor standing in free space	92dB/W 50Hz	R	60
KEF 107 £2025	Very Good Good+	A welcome sense of ease and lack of strain at most normal levels. Minor criticisms included a dulling in the extreme treble. Excellent bass extension	116.5 x 33 x 45cm on floor in free space	87.5dB/W 20Hz	R	60
Linn Helix £279	Average+ Good	Attractive presentation is coupled with an attractively lively sound which is more neutral if less committed than earlier Linn loudspeakers	51 x 25.5 x 28cm stands 1ft from rear wall	88dB/W 53Hz	R	66
Linn Nexus £379	Good Average	Good features include a solid, meaty bass plus good imagery and tonal balance. The catch is that Nexus lacks resolution and timing	49 x 23.5 x 30.4cm near rear wall supplied stands	89dB/W 60Hz		59
Linn Sara £795	Good Very Good	The new Sara is now much smoother and sweeter, with much better imaging. Bass power and dynamics are as good as ever, and the system is no longer as fussy as before	43 x 34.4 x 26.5cm stand mounting, near wall	88dB/W 50Hz	R	60
Magneplanar SMGa £675	Average- Average	Tonally 'rich', in the right room it proved a satisfactory musical experience	122 x 48 x 4.5cm on floor clear of wall	85dB/W 56Hz		46
Magneplanar MG1.4 £1098	Good+ Good+	Replaces the stalwart MG1c with a revised panel layout. Offers a very crisp and articulate sound, particularly revealing of upper mid vocal details	155 x 8 x 57cm open space	88dB 40Hz	R	72
Magneplanar MG2.5R £1897	Good Good	Offers the low coloration and profound musical insight of better electrostatic loudspeakers but without loss of low frequency extension	183 x 56 x 4.5cm Open space	83-85dB/W 35Hz	R	60
Magneplanar MG11a £2650	Good Very Good	Another excellent true-audiophile loudspeaker this American panel speaker helps to convey much of the original character of the music	180 x 62 x 38cm well clear of walls	84-86dB/W 35Hz	R	46
Marantz LD20 DMS £150	Average Average	Recommended more for CD users than vinyl keepers, soundly engineered and built but should be heard before bought	36 x 23 x 24cm free space on 45cm stands	86.5dB/W 55Hz		53

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

## THE DIRECTORY

## LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
<b>Marantz LD500MS</b> £200	Very Good Good—	Well behaved larger two-way has fine balance, stereo and integration with good bass extension, albeit with mild 'boxy', 'chesty' and 'tizzy' effects	42.5 x 27 x 28cm stands in free space	87dB/W 50Hz	BB	71
<b>Martin Logan CLS II</b> £3750	n/a Very Good	Much improved high resolution design, fussy about system set-up and demanding of ancillaries and software alike. It rewards the efforts though	60 x 28 x 7.5cm open space	86dB/W 45Hz	R	72
<b>MB Quart 220</b> £270	Average— Average	The elaborate and pretty enclosure in a wide range of finishes works better than the drivers and crossover, which impose a lumpy balance	30 x 22.5 x 21cm stands in free space	87.5dB/W 80Hz		74
<b>MB Quart 390</b> £469	Below Average Poor	An aggressive, messy sounding design whose uncouthness undermines the positive level of detail	52 x 31 x 30.5cm open space, on stands	89.5dB/W 60Hz		59
<b>Meridian M30</b> £775	Average+ Average	Pricy but easy on the ears and worth considering especially where space is at a premium	38.5 x 18 x 32cm free space on stands	Active 40Hz		46
<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 762</b> £180	Average Average—	Mission's 'bookshelf middleweight' offers high sensitivity and loudness capability, but at the expense of a somewhat untidy and rather 'heavy' sound	50 x 25 x 27cm stand, experiment advised	91dB/W 55Hz		66
<b>Mission 763</b> £280	Average+ Average+	A very artful combination of generous volume and good bass extension at a modest price. Works well in the listening room despite a few rough edges	77 x 25 x 32cm near rear wall	86dB 40Hz	BB	68
<b>Mission Cyrus 782</b> £340 (stands £80)	Good— Good—	Lively, articulate and beautifully finished, this compact wall-mount model with twin main drivers has good integration but a rather rich, 'loudness' balance	50 x 25 x 32.5cm Cyrus stands near wall	90dB/W 50Hz		71
<b>Mission 764</b> £400	Good Good—	Large floorstander has fine bass extension but limited dynamic range, and sounds 'lazier' than Best Buy 763	86 x 25 x 32cm 0.5+m from rear wall	86dB/W 43Hz		71
<b>Monitor Audio Monitor 7</b> £150	Average— Average	This lively and punchy near-miniature looks pretty enough and is good value but is let down by an unruly and indifferently integrated tweeter	34 x 16.5 x 17cm stands 1ft from wall	84dB/W 70Hz		74
<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 R300/MD</b> £250	Average Average—	An attractive 'large bookshelf' model that's handicapped by poor crossover and integration between paper cone bass and metal dome tweeter	47.5 x 25 x 30.5cm stands in free space	88dB/W 50Hz		71
<b>Monitor Audio R352/MD</b> £299	Average+ Good	A good value large box that sounds more engaging than subtle, providing a good compromise between bandwidth and sensitivity	64 x 25 x 32cm stands in free space	89dB/W 45Hz	R	66
<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/Gold MD</b> £449	Good Good	Luxury build and 'high tech' tweeter or not, this compact model offers good refinement and detail on an open soundstage	45 x 25 x 26cm stands in free space	86dB/W 50Hz	R	66
<b>Monitor Audio 1200 Gold MD</b> £799	Average Average+	This smooth and civilised slimline floorstanding loudspeaker is well built and nicely presented. But it is also expensive	94 x 20 x 26cm in free space	85dB/W 48Hz		68
<b>Mordaunt Short MST0 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 unsubtle	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 Reference 2</b> £199	Good— Good—	This compact wall-mount design with advanced drivers has good dynamics, balance and stereo, plus flashy styling and some midband 'boxy' coloration	38 x 25 x 20cm stands near rear wall	88dB/W 50Hz		71
<b>Musical Fidelity MC-2*</b> £299	Very Good Good++	This exceptionally clean and clear design offers real subtlety and finesse. Bass quality is light but exceptionally clear, the treble is smooth if slightly shallow	48.5 x 25.5 x 16.5cm open space and stands	87.5dB/W 65Hz	BB	66
<b>Musical Fidelity MC-4*</b> £499	Very Good+ Good++	Achieving a very high standard, the MC-4 sounds detailed and coherent like the MC-2, but with more bass depth and solidity, and large image scale	56.5 x 26.9 x 29cm open space on stands	87.5dB/W 60Hz	R	59
<b>NVA Cube 1</b> £600 (stands £200)	Good— Good+	Attractive, cube-shaped semi-omni is very sturdily built, and gives an idiosyncratic but unusually open, spacious and informative sound	33 x 32 x 32cm own stands c0.5m from wall	85dB/W 52Hz	R	71
<b>Opus 3 Credo</b> £399	Average Average	Credo's odd-shaped silicate-based cabinet confers good box and bass performance, but the sound could be more neutral for the price	32 x 28 x 32cm stands in free space	88dB/W 65Hz		74
<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
<b>Quad ESL-63</b> £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
<b>Richard Allan CD5</b> £242	Average— Average—	This neatly presented small reflex design can sound engagingly communicative, but is flawed sonically and technically and quite expensive too	38 x 19 x 23cm on rigid stands	88dB/W 80Hz		68
<b>Rogers LS7t</b> £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
<b>Rogers Studio 1a</b> £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
<b>Rotel RL850 II</b> £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
<b>Royd A7 Series 11</b> £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
<b>Royd Eden</b> £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
<b>Ruark Swordsman</b> £200	Good Average	Very attractively styled and finished, the Swordsman is a well built 'small bookshelf' model that delivered better test than listening results	38.5 x 20 x 27.5cm stands 0.5m from wall	84dB/W 50Hz		71
<b>SD Acoustics DBS</b> £695	Average Good+	Large but unusually pretty, needs a (big) room and has a sting at the top, but the transparent dipole midband provides an unusually open and dynamic sound	102 x 35 x 25cm spiked, in free space	86dB/W 45Hz	R	71
<b>SD Acoustics SD1</b> £1150	Average Very Good	A large scale, airy and unusually detailed system with excellent dynamics. Balance is light and bright, and the original model could upset some systems/listeners. Current model has more civilised top-end and warmer overall balance	123.5 x 38.2 x 31.9cm free standing, away from walls	90dB/W 50Hz	R	60
<b>Shan Shimna</b> £280 (stands £75)	Average+ Good—	Pretty little miniature in cast mineral/plastics has limited dynamic range and could sound smoother, but integration is good and box effects slight	31 x 16 x 17cm stands near rear wall	84dB/W 65Hz	R	71
<b>Snell Type C</b> £2350	n/a Very Good	Pricy, yes, but an extremely capable loudspeaker. Musical and transparent, excellent bass extension	112 x 38 x 33 free standing away from walls	90dB 35Hz	R	65

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

# THE DIRECTORY

## LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Sony APM-101ES £99	Good Average	Big hearted sound from small bookshelf successor to BB '10ES, sounds a little untidy at frequency extremes, so suits CD better than vinyl!	39.5 x 22.5 x 23.5 stands in open space	86dB/W 52Hz	R	71
Sony APM-181ES £300	Very Good Average	Big and beefy but also somewhat fat and bass heavy, this well engineered three-way has notable strengths but lacks transparency and sounds better at lower levels	57.5 x 29 x 36cm stands in open space	87dB/W 40Hz		71
Sony APM 66ES £700	Average+ Average+	Powerful heavyweight sound with a brilliant midband - clear articulate and transparent. But the bass is on the boomy side and the treble can sound grainy	66 x 38 x 36.5cm open space, low stands	89dB/W 60Hz		59
Spendor SP2 £470	Very Good Good+	Conceding little to the SP1, this 30 litre model displayed good tonal balance with a highly articulate midrange, only slightly marred at frequency extremes	50 x 25 x 30cm free space, stands	87dB/W 45Hz	R*	59
Spendor SP1 £710	Very Good Good	A very subtle and musical performer that works particularly well with digital material. An exceptional allrounder	63.5 x 29.5 x 30.5cm stands in open space	87dB/W 41Hz	R	60
Spendor SA3 Passive £1500	— Good+	Same as Spendor SA3 active	85 x 38 x 46cm low	89dB/W 32Hz	R	46
Spendor SA3 Active £2900	Good+ Very Good	Substantial speakers designed to deliver high sound levels and killer bass. Suited to larger rooms and power hungry ears	85 x 38 x 46cm low rigid stands in free space	89dB/W 32Hz	R	46
Spica TC50 £595	Good— Good	This triangular-profile 'grown up' miniature is a shade boxy and laid back but has good rhythmic and musical integrity	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica TC50SE £795	Good— Good	A heavily UK-modified TC50, the SE sounds less boxy and more spacious, but lacks some of the urgency of the standard model	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica Angelus £1195	Good Average	A little bass shy and soft in the bass and lower mid, the Angelus is otherwise tidy, extremely lively and fluid, if uneven overall	116.8 x 53.3 x 26cm free standing away from walls	86.5dB/W 50Hz		60
Studio Power Sapphire £130	Poor Average—	Balance difficulties are improving, though still prevent the potential of this interesting metal-cone new miniature from being fully realised	30 x 20 x 19.5cm stands near rear wall	85dB/W 70Hz		66
Tannoy Eclipse £120	Average+ Good	Although a little bright, the essentials are right: hear-through clarity at all frequencies, good dynamics, firm bass	38.8 x 22.6 x 21cm semi open on stands	87dB/W 65Hz	BB	59
Tannoy Mercury S £160	Good Good	A fine budget allrounder in the now established Mercury tradition; good balance and reasonable refinement will ensure wide appeal	49.5 x 25 x 21.5cm stands in free space	87dB/W 50Hz	BB	66
Tannoy DC1000 £199	Average Average—	The smaller of two DC models with dual concentric drivers, the '1000 is much less well balanced than the larger, floorstanding '2000	50 x 24 x 25cm	91dB/W 53Hz		71
Tannoy M20 Gold £200	Good Average+	Luxury version of Mercury S with real wood and bi-wire frills doesn't necessarily sound any better overall, but still fine value	49.5 x 25 x 21.5cm stands in free space	87dB/W 50Hz	R	68
Tannoy DC2000 £300	Good Good	Remarkably high sensitivity from unique dual concentric driver that has an involving but characteristic sound. Bass could be better	68.5 x 26 x 27cm floor in free space	93dB/W 55Hz	R	66
Tannoy Westminster £3400	n/a Good+	These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge, flat against rear wall, away from corners	96dB/W (manuf.)	R	Coll
TDL Monitor £1600	Very Good Very Good	Fine solidity and good accuracy, with enough bass extension to satisfy even organ freaks. Needs a large room and can sound a bit lazy and a shade tinkly	118.5 x 30 x 47cm 0.5m from walls	85dB/W 28Hz	R	66
Technics SBC 250 £130	Average+ Average—	Despite a fairly even tonal balance, the 250EK sounded muddled in the midrange and dull in character	36.5 x 23.5 x 20.5cm free space, stands	86dB/W 60Hz		46
Technics SB-RX50 £500	Very Good Average+	With its unique coaxial drive unit the RX50 proved a smooth and well balanced loudspeaker, its minor weakness being a mildly excessive low bass	48 x 30 x 26cm free space on 40cm stands	86dB/W 40Hz	R	46
Toshiba SS33-M £90	Average Average	Providing a benchmark for budget loudspeakers, this Toshiba-inspired but UK designed and manufactured model is a lot of loudspeaker for the money, if a shade on the cheap	40 x 26 x 21.5cm stands in free space	86dB/W 55Hz	BB	68
Townshend Glastonbury II £1700	n/a Very Good	What? No bass? Actually, like the KEF 107, Glastonbury II goes down so low you might not notice how good it is. A truly remarkable performer. Superb soundstaging too	91.5 x 28 x 46 free standing in room corners	88dB 27Hz	R	65
Videotone Minimax 2 £80	Poor Average—	Cheap in build and QC as well as price, but cheerful (if coarse) with it - if a little too cheerful after extended listening	27.5 x 17 x 20cm near rear wall	84dB/W 90Hz	R	74
Visonik David 6000i £160	Average— Poor	Sharp styling a classy looking miniature makes, but the complex grillework worsens a sound which starts off with too much top and not enough bottom	20 x 12 x 13cm against rear wall	87dB/W 130Hz		74
Wharfedale Delta 30 £79	Good Average	Very clear and surprisingly neutral for the price, with good dynamics and stereo within limited volume ceiling	37.9 x 20 x 16.9cm near wall on high stands	88.5dB/W 80Hz	BB	59
Wharfedale Delta 50 £99	Average+ Average—	"There's nothing obviously wrong, but it seems a bit mundane," is what we said when the Delta 50 was £129. But since then the price has dropped by 30 per cent, making it great value	48 x 27 x 19cm near wall on 40cm stands	88dB/W 55Hz		53
Wharfedale Diamond 111 £99	Below Average Average—	This latest version of the long running Diamond sports a better tweeter, but bass, though deep, is soft and the midband is indistinct and uneven	24 x 18.5 x 20.5cm near wall, stands	86.5dB/W 75Hz		59
Wharfedale Super Diamond £139	Average Average—	Although there are improvements on the basic "legendary" model, listening panelists did not get airborne about this upgrade	24 x 19 x 19cm close to wall at head height	88dB/W 57Hz		53
Wharfedale 504/2 £139	Average Average	Not strictly accurate, this musically involving miniature sounds unusually coherent and well integrated, if a shade dull in balance	29 x 18.5 x 19cm stands against rear wall	84dB/W 60Hz	R	68
Wharfedale 505/2 £169	Average Good	This lively Wharfedale provides plenty of speaker with unusual refinement for the money, and should be fairly tolerant of room siting	44 x 25.5 x 24cm stands 1ft from wall	86dB/W 55Hz	BB	66
Wharfedale 510/2 £299	Average Average—	Even in 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.

## THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



# THE DIRECTORY

## CASSETTE DECKS

The bad odour of copyright theft hangs around the compact cassette, but there is no doubt it is the world's most versatile and ubiquitous music storage medium. Hi-fi buffs may wrinkle their noses pointedly, but are still happy to use cassette decks to make up tapes for the car or personal – at the same time complaining loudly about the quality of pre-recorded material. (In fact the very best decks can do a surprisingly good job with musicassettes.)

There is no problem in connecting a cassette deck to any normal amplifier, but some care needs

to be taken in choosing the best tapes for a specific machine. (Trial and error is one effective technique, but many decks have manual bias adjustment and some match up to the tape automatically.) Lab performance and sound quality often go hand in hand, and are frequently somewhat dependent upon factory alignment. The mechanical integrity of the mechanism itself is another crucial factor, that is often reflected in the asking price.

All modern hi-fi decks have Dolby B and the majority have Dolby C besides; the very worthwhile

HX Pro system is becoming steadily more widespread. Remote control remains rare, though sometimes it is available as a system option. Three-head recorders allow simultaneous checking of the recording being made. Auto-reverse is a useful convenience feature, but usually with some mechanical compromise, while double-mechanism 'dubbing' decks of dubious quality are fashionable at the bottom end of the market. The welter of different 'music search' systems available is some indication of their frequent ineffectiveness.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research RD-06 £280	Average Average +	Acceptable middle market player with very simple facilities and cramped control section, but unusually good looks	Dolby B/C HX Pro, fine bias, counter memory, repeat	BB	69
Aiwa AD-F270 £90	Average Average +	An excellent budget machine, adequately equipped and satisfactorily built. Sound quality is in severe danger of transcending the price category	Dolby B/C, fine bias adjust	BB	75
Aiwa AD-F370 £130	Average Average	Adequate but uninspiring recorder with detail shortcomings but good control layout and successful sounding with recorded musicassettes	Dolby B, C, HX Pro, bias adjust		63
Aiwa AD-R470 £150	Average Good	For once, an auto-reverse deck with the performance of a decent unidirectional one at a similar price. The Aiwa is modern in concept and execution, and has good, transparent electronics	Dolby B/C/HX Pro, auto reverse, cue & review, bias adjust	BB	69
Aiwa AD-WX777 £179	Very Good Very Good	Excellent, middle price dual deck with quick side change and a living, breathing sound – though prerecorded tapes sound bright	Twin auto-reverse, one records. Dolby B/C, fine bias	BB	75
Aiwa AD-F700 £199	Good Average –	Somewhat less than the sum of the (most fine) individual parts, this deck has an artificial quality which spoiled the efforts of a fine transport	Dolby B/C/HX Pro, fine bias, CD Direct input		75
Aiwa AD-F800 £249	Good Very Good	Close to first class performance – and superb value. The Aiwa is purposeful and finely engineered. It provides a near irresistible blend of good mechanics and electronics	3 head, dual capstan, Dolby B/C/HX Pro, tape calibration	BB	75
Aiwa AD-WX888 £249	Good Good	Inaccurate set-up spoils metal tape operation, but with other tapes the deck works well. This deck offers fine engineering, facilities and sound	Dual auto-reverse twin deck, Dolby B, C and HX Pro	R	75
Aiwa XK-007 Excelia £400	Good Good	Downmarket version of XK-009 with simplified bias/equalisation adjustment section and more forgiving but less informative sound. Still good, but less exciting than XK-009	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment		63
Aiwa AD-WX909 £400	Good Good	Convenience meets sound quality, and both win. An essentially clean, positive recorder which works alongside an auto-reverse player of lower standard – a sensible compromise	Dual deck, auto-reverse, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57
Aiwa XK-009 Excelia £550	Very Good Very Good	Excellent detail, stable articulate midband and slightly obvious treble. The most interesting Aiwa for yonks	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment, CD direct	R	63
Akai GX-32 £200	Average Poor	Constrained and smeared sum this deck well. It has poor bass and treble definition alike, though it proved well aligned for prerecorded cassettes	Dolby B/C, variable bias, headphone out, track search		69
Akai GX-52 £249	Very Good Very Good	Well finished and a pleasure to use this well specified deck sounds clean and defined with all tape groups, with or without Dolby	Dolby B, C, HX Pro, track locate features	BB	57
Akai GX-6 £350	Good Good	There is a strong sense that someone has really thought this one through; it has an indefinable 'specialness'	Real-time counter, track search, Dolby B, C, bias adjust	R	52
Akai GX-95 £400	Good Very Good	Well designed and finished cassette deck with features well judged to please the audiophile – especially switchable Dolby HX Pro and switchable panel display. The calibration system is simple and effective, and the deck sounds great	Dolby B/C/HX Pro, 3 head, manual tape set-up	R	69
Denon DR-M07 £125	Poor+ Average	There were several problems with the test player that render it an unsafe purchase. This is a pity since despite the antiquated control system, the deck is capable of refined sound quality	Dolby B/C, fine bias adjust		69
Denon DRM-500 £170	Good Very Good	Powerful, refined and detailed sound, and an excellent transport are keys to the success of this cleanly styled addition to the range – but why no timer standby?	Dolby B/C/HX Pro, variable bias	BB	75
Denon DR-M12HX £220	Good Good +	Well constructed and pleasant to use, a lack of true pitch constancy kept it from sounding superb	Track search, Dolby B, C, HX Pro, bias adjust	R	57
Denon DRW-750 £229	Good Good	Polished and articulate, the only significant shortcoming is poor performance with prerecorded material	Dolby B/C/HX Pro, twin unidirectional, one records	R	69
Denon DR-M24HX £290	Good Good +	This deck will slot into many high grade systems without disgracing itself – or the cassette medium. Very presentable high resolution sound with good stereo with or without Dolby	Dolby B, C, HX Pro, bias adjust, 3 Head	R	60
Denon DRM-800 £299	Good Very Good	There are some niggling faults and limitations (no timer standby is particularly annoying), but as a means of recording music it sets a very high standard	Dolby B/C/HX Pro, off tape monitoring, dual capstan	R	75
Denon DR-M34HR £320	Very Good Good +	Prerecorded cassettes sounded grey and dull, but this may have been a sample fault. As a recorder, the DR-M34 is refined and detailed – and good value	Dolby B, C, HX Pro, 3 Head, manual tape calibration, memory counter		63
Dual CC8010 £110	Average Average +	The only limitation worth noting is a slight opaqueness; the Dual otherwise sounds stable and effective. An excellent low-cost design	Dolby B & C, microphone input	BB	63
Goodmans GSW-5200 £90	Poor Poor	Musically unimpressive but at least it's cheap!	Dolby B, twin, one records		69
Grundig Fine Arts CCT-903 n/a (system component)	Good Good –	[Competent part of complete Grundig system]. Solid and well engineered deck with small but significant problems preventing it scoring highly. Basic design generally – and transport specifically – are excellent	Dolby B/C, twin auto reverse, one records		69
Harman Kardon CD491 £695	Good Good +	Excellent audio engineering and tremendous flexibility make this an audiophile cassette deck 'par excellence'	Real-time counter, auto reverse, track search, Dolby B, C, HX Pro, bias adjust	R	52
Kenwood KX-440HX £140	Average + Poor	Uneven, unstable sounding player with limited resolving power, but good control layout and finish	Dolby B, C, HX Pro, intro scan		63
Kenwood KX-3010 £170	Average + Average	Minor ergonomic shortcomings notwithstanding, this is a workmanlike deck that only misses recommendation due to an azimuth problem leading to very dull sound with prerecorded tapes.	Dolby B, C, HX Pro, auto bias		75
Kenwood KX-5010 £269	Very Good Excellent	This important new middle price deck is a well thought through and thoroughly developed design which eschews gimmicks for the sake of musical excellence	Dolby B/C/HX Pro, auto tape calibration, track/intro search	BB	69
Kenwood KX-9010 £400	Very Good Average +	Clean, detailed but flat and overtly hi-fi-ish sound quality makes the 9010 a little less than the sum of its parts.	3-head, auto tape calibration, Dolby B/C/HX Pro, remote control		75
Marantz SD-35 £150	Good Good +	Rock steady tape transport gives very competitive sound quality for the price, but the slightly bright replay may not appeal to some	Dolby B & C, bias adjust	R	52
Marantz SD-45II £200	Good + Good +	Well built and dynamic sounding player, working better as a recorder than with musicassettes	Dolby B & C, bias adjust Auto selection	R	52
Marantz CP230 £300	Average Average	This is a competitively priced portable recorder though not suited to replay of musicassettes	Dolby B, bias adjust	R	52
Marantz SD-55 £349	Good Very Good	Slightly tacky feel and restricted signal/noise performance are the main shortcomings of an excellent sounding piece of kit	Real-time counter, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57

### THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



# THE DIRECTORY

## CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Marantz SD585 £300	Average Average—	Sound quality is a little soft upon, and control ergonomics are somewhat opaque, though the twin auto-reverse/recording capability makes this a powerful machine	Dolby B/C, twin auto-reverse & record, parallel recording etc		69
Memorex SCT-84 £200	Average+ Average+	The playback only transport is a little disappointing, but the record one is a quality item and the deck works well. Ergonomics are good but styling and control feel are decidedly tacky.	Dolby B/C, fine bias, twin with auto-reverse record, unidirectional play	R	69
NAD 6300 £550	Very Good Very Good	Solid and homogeneous sound quality and very good replay compatibility thanks to 'play trim'. Distinctive, musical – and costly	Dolby B, C, HX Pro, 3 Head, bias adjust	R	63
Nakamichi CR-1E £345	Very Good Good	Modestly equipped by any standards, the CR-1E stands or falls by its build quality, which is high, and sound which is highly competent	Dolby B & C		57
Nakamichi CR-2E £395	Very Good Good+	Ordinary to look at, in some respects rather awkward to use (tape switching especially), the CR-2E sounds very slightly better than the CR-1E, and therefore ranks well. But it doesn't come cheap	Dolby B & C, bias adjust, remote control	R	57
Nakamichi RX-202E £545	Good Very Good+	Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control system	Auto reverse, Dolby B, C, 2 Head	R	63
Nakamichi CR-3E £595	Very Good Very Good	The user interface is a little clumsy, though conceptually straightforward. Sound quality approaches the CR-4E, and is amongst the best at the price	Dolby B & C, bias adjust, remote control	R	57
Nakamichi CR-4E £745	Very Good+ Very Good+	High class deck with a reasonably full range of features and superb sound at a slightly unlikely price	Dolby B & C, bias adjust, remote control, 3 Head	R	57
Nakamichi CR-5E £995	Excellent Excellent	A slightly simplified version of the all-conquering CR-7, the CR-5 has a very similar standard of audio performance – the best	Dolby B/C, fine bias, 3-head	R	69
Nakamichi CR-7E £1500	Excellent Excellent	Remarkably this deck is not only ergonomically but also sonically superior to the Dragon, particularly on record/replay	Real-time counter, track search, Dolby B & C, tape alignment adjust, bias adjust, remote control, 3 Head	R	60
Nakamichi Dragon £1750	Excellent Excellent	Previous to the birth of the CR-7E, this machine stood head and shoulders above the rest. It is still the ultimate for musiccassette replay	Auto reverse, Dolby B & C, tape alignment adjust, bias adjust, remote		60
Dnkyo TA-2120 £130	Average+ Good	Clear, vivid sound with good timing and resolution when using Type II tapes without Dolby. The controls are less inspiring – the meters in particular are plainly inadequate	Dolby B/C, auto tape sensing, block/side repeat	R	63
Dnkyo TA 2130 £160	Average+ Average+	Rating fairly well on both pre-recorded and record/playback, ergonomics were a little poor but overall performance was generally consistent	Track search, Dolby B & C, bias adjust		52
Philips FC566 £179	Average+ Average+	Mostly well equipped, though some tape search facilities fail to exploit the auto-reverse capability. Sounds clean and stable – with prerecorded tapes too	Auto reverse, track search, Dolby B & C		57
Philips FC567 £279	Average Poor	Well equipped but ergonomically substandard; sound quality is messy and lacking in clarity and dynamics	Dual deck, auto reverse, track search, Dolby B & C		57
Pioneer CT-656 £250	Good Good	Well conceived and executed low cost 3-head recorder. It benefits from and makes good use of metal tapes, but is never less than tough and stable sounding – even with ferric tapes	3 heads, off tape monitoring, fine bias, Dolby B/C/HX Pro	R	75
Pioneer CT-737 Mk II £350	Good Average+	Easy to use and sensibly equipped, the CT-737 is much improved, but sound quality is still a tad lacklustre	3-head, Dolby B/C/HX Pro, manual record bias/sensitivity		75
Pioneer CT-91a £500	Very Good+ Very Good+	Superb, near state of the art recorder with an excellent dual capstan transport and very capable electronics. At the price, this one is a mould breaker	3-head, tape calibration, Dolby B/C/HX Pro	R	75
Proton AD-200 £140	Poor Poor	Sound quality is essentially on a par with many portables, and has nothing to do with high fidelity. The main problems are an unrelenting hardness and an almost total lack of detail	Dolby B & C		57
Proton AD-300 £200	Average— Poor	High levels of flutter give sound a roughness and coarseness that rules it out for high quality work. The record and replay electronics certainly deserve better	Auto reverse, Dolby B & C		57
Revox B215-S £1481	Very Good Very Good+	This is a superbly engineered deck with a classically fine performance that almost transcends the stereotypes. Ergonomics are flawed but the user interface is both powerful and flexible	3-head, dual capstan, Dolby B/C/HX Pro, auto calibration	R	75
Rotel RD-865 £200	Good Very Good	Fine, architecturally solid sound quality in a package with a low gimmick count and strong audiophile appeal	Dolby B/C/HX Pro, fine bias	BB	75
SAE C102 £549	Average+ Good	Looking most unlike a cassette deck designed in the States and proving competitive in its price group. Not sonically that outstanding, however	Real-time counter, track search, Dolby B & C		52
Sansui D-X301i £150	Average+ Good	Lively, informative and well equipped basic deck, if rather obscure operationally	Dolby B/C/HX Pro, variable bias, track search	R	69
Sony TC-FX110B £90	Poor+ Poor+	Woolly bass and scrappy treble combine to make a meal of many music types, despite accurate response shapes with most types of tape. Prerecorded material sounds dull	Dolby B/C		75
Sony TC-TX55 £150	Average Average+	The sound quality ranking is a good one for an auto reverse machine at this price level. Clean, sharp sound, only slightly let down in the deep bass.	Auto reverse, Dolby B, C & HX Pro	R	75
Sony (WMD6C) ProWalkman £249	Good+ Very Good	"One of the finest sounding cassette decks on the market today. A mandatory Best Buy, which also fits in your pocket"	Dolby B, & C	BB	60
Sony TC-RX60ES £250	Average Average	For once a stable sounding auto-reverse deck but sound quality is rather 'dirty' and compressed, especially with Dolby C	Auto-reverse, Dolby B/C/HX Pro, auto tape recognition		63
Sony TC-RX80ES £350	Average+ Good	Clean, powerful and detailed sound, especially without Dolby C. Stable pitch – but prerecorded cassettes sounded disappointing	Auto reverse, Dolby B/C/HX Pro, bias/level adjust	R	63
Teac V-250 £89	Average Average	Ultra-basic design which works quite well. Lack of pitch integrity is the main shortcoming, but it wasn't always noticeable	Dolby B	R	63
Teac V-270C £109	Average— Average—	Not quite cheap enough to compete solely on price, the V-270C is a rather messy and unstable sounding deck	Dolby B & C, bias adjust		63
Teac V-285CHX £115	Average— Poor	Poor, threadbare sound quality under most conditions of use. Cheap, but not a real bargain because it doesn't really work	Dolby B & C, fine bias adjust		75
Teac W-355 £119	Poor Average+	A better than expected performer. Often a little ragged, even unsteady, the design is nevertheless quite lively and engaging. A viable basic twin deck machine	One record, one play transport, Dolby B		75

To Advertise in  
this space ring Miriam Young  
on 01-631 1433

## THE DIRECTORY

## CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>Teac V-480</b> £129	Average Average+	A rather utilitarian model, the V-480 just makes it on to our recommended list by virtue of a clean, open sound that to an extent transcends the measurements	Dolby B/C/HX Pro, fine bias	R	75
<b>Teac W-450R</b> £159	Poor Average+	This model does a great deal for the money. It has severe measured shortcomings, but sound quality that is almost good enough. Interesting, but not quite obvious material for commendation	Twin auto-reverse, one records, Dolby B/C/HX Pro		75
<b>Teac W-470</b> £179	Average— Average	A low grade transport is allied to respectable electronics to give sound quality ranging between acceptable and good. Prerecorded tapes sound bright	Twin deck, one records, Dolby B/C, intro-search		75
<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>Teac W-990RX</b> £499	Good Good	A mess with dbx, but taut and articulate otherwise. The 990, though expensive, has a powerful range of features, making it one of the few really ambitious decks to successfully straddle both sets of requirements	Dolby B/C & dbx, dual auto-reverse/record, parallel & sequential recording, remote	R	69
<b>Teac R-919X</b> £599	Very Good Average	Superbly equipped, yet usable – and well built too. But sound quality is something of a disappointment at this price level, being appropriate for a model about half the price	3-head auto-reverse, tape calibration, Dolby B/C/HX Pro/dbx		75
<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-TR255</b> £160	Average Average	Neat, sensibly designed middle of the road dual transport recorder, suitable where the ability to dub tapes is a particular priority	Twin transports, one records and auto-reverse, Dolby B/C	R	75
<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-TR355</b> £200	Average Average	Serviceable middle market dual deck without serious fault but with some annoying inadequacies, notably an inability to play side A and B and then stop	Twin auto-reverse, one records, Dolby B/C/HX Pro		75
<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-230</b> £140	Average+ Average+	A strong near-budget performer, the strengths include good overall sound, excellent search aids. Weaknesses: ergonomics, soggy bass with prerecorded material	Dolby B/C/HX Pro, variable bias	R	75
<b>Yamaha KX-300</b> £160	Average+ Average—	Uncommonly well equipped and adequately made and presented, this model turned out to be a disappointingly uncertain proposition on audition	Track search, Dolby B, C, HX Pro with 'play trim', bias adjust, remote control		57
<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

## 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-1 000ES – but with an inferior front panel design	Track ID and search, remote	R	63
<b>Grundig Fine Arts DAT-9000</b> n/a (system component)	Good Good	Conventional DAT recorder offering standard facilities. The deck is well made and equipped, and is engineered to a satisfactory quality standard. It performs to an acceptable standard, though it is not state of the art	2/4 hour recording, mic inputs, digital in/out		69
<b>Luxman KD-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>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	Midi-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

To Advertise in  
this space ring Miriam Young  
on 01-631 1433

# THE DIRECTORY

## CD PLAYERS

This all-digital music source is well established, despite still high disc prices and the opposition of many hi-fi enthusiasts. Compact Disc's strengths over conventional vinyl are complete freedom from surface noise with automatic and programmable play, plus track skip and fast music scan – frequently under full remote control. However, many vinyl enthusiasts find CDs sound less involving than

top quality vinyl replay. Introduced five years ago at around £500, CD players now average less than half that price, and for the main offer improved performance besides. Even cheaper players may have the latest decoding chips and the most useful play features; extra money can buy remote control, remote volume control, audio 'tweaks', plus improved build and component

quality control. Compared with many hi-fi components, CD players give impressive lab performance, though there are differences between players nonetheless. **Sound quality** variations are even more marked, particularly in a good quality system. As it behaves very like a preamp, there are no problems connecting a player to a normal amplifier.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
ADC CD 2000E £330	Good+ Fair+	One of the slimmest players in the business but nothing special inside. Nice ergonomics but overpriced	Remote, timeshared 16 bit		64
Aiwa DX-M45 £149	Fair Fair	Cutdown Philips technology, but results are quite good for this British made machine	Manual	R	64
Aiwa XC-005 £280	Average Average+	Very comprehensively equipped including double digital and audio outputs. The average performance was still sufficient for recommendation at this price	Power vol, edit-dubbing, shuffle 2 digital op	R	76
Aiwa CD-001 £300	Good Good	Pretty close to Recommendation, delivering a respectable sound quality and lab performance from an ergonomically attractive package, but ultimately failed to excel in any particular respect.	Track entry/volume remote, direct recorder connection etc.		58
Aiwa XC-007 £499	Very Good Good	Creditable sound despite inverted output, high tech engineering with very good lab performance. A worthy contender but not cheap	Remote, keypad, timer, digital output, pseudo 20 bit, dual DAC		64
Akai CD-52 £249	Good Good	A nice surprise from Akai, genuinely good sound from this mid-priced model. Better linearity will help further	Remote, digital output, headphone socket	BB	64
Akai CD-62 £330	Fair Very Good	Looks, build quality and the technical specification are right up to date. As it stands it sounds very good but if the indifferent lab performance could be improved, it would probably sound even better.	Remote, programme, hdp, comprehensive display etc	BB	70
Akai CD-73 £450	Good Average	A little uneven musically, the Akai tends to smother fine detail, but has first class dynamics and stereo imagery. Worth auditioning	Track entry keypad remote, menu display (switchable)		62
Akai CD93 £700	Good Very Good	Undoubtedly a CD player of real class in build, presentation, lab performance and sound quality, but also a shade expensive for formal Recommendation – though that's not to dissuade lovers of black lacquer wood finish.	Track entry remote, menu display etc.		58
Arcam Delta Black Box £250	n/a Very Good	This rich, powerful and articulate sounding DAC transforms the majority of medium price CD players	Needs D-out CD players	R	60
Arcam Black Box II £299	Very Good Very Good	An addition to the BB I, it also offers improved sound and more inputs	Optical and wired input digital decoder	BB	76
Arcam Delta 70 II £550	Very Good Good	Now in Mk II form a further improvement is seen in features, performance and sound quality. Solidly built and British	Now adds simple remote vol + std features; also display off	R	76
Arcam Delta 170 Transport £599	Very Good Very Good	While no bargain, this is a well made metal boxed transport providing clean digital data for onboard decoder/processors	Transport only, display off, usual programming	R	76
Cambridge Audio CD2 £650	Fair Very Good	The finest midrange in digital audio is sufficient grounds for Recommendation, though there remains a tinge of disappointment that the CD2 didn't get closer to big brother elsewhere, notably in the bass.	16x oversampling, remote control	R	58
Carver TL 3100 £340	Average Average-	The sound quality did not live up to the excellent fascia. Carver's DTL did not aid the indifferent sound	DTL sound shaping, usual facilities, remote, memory		76
conrad johnson DFI £1,995	Average- Good+	Setting a decent standard and including an FET line preamplifier, the unusual DFI is worth investigating	Line preamp built-in, simple remote facilities		76
dbx DX5 £640	Good Poor	Sound quality proved a single disappointment, though it's refreshingly unique in providing semi-pro post-production facilities that some users will undoubtedly relish.	Track entry/volume remote, compression, impact recovery, ambience etc.		58
Denon DCD 610 £200	Good + Fair+	Lots of Denon player for the money, well equipped with good all round performance	Remote, versatile programming 2x 0/S	BB	64
Denon DCD820 £249	Average + Average-	A powerful combination of features and build for the money ensures recommendation. The sound is just good enough	Well equipped, power vol, edit etc, digital out	R	76
Denon DCD 810 £250	Very Good Fair+	A good value allrounder bettered on sheet value by the 610 and 910, power volume could sound better	Remote, 4x oversampling, programming	R	64
Denon DCD 910 £300	Very Good Fair+	A well equipped deck of impressive appearance and solid sonic and lab performance	Remote volume, programming, 8x 0/S digital output	BB	64
Denon DCD1420 £400	Very Good Average	Superbly equipped with a fine lab performance, this modern player needs a touch more sonic spice to be recommended	20-bit, very comprehensive, remote, power volume etc		76
Denon DCD-1500II £500	Very Good Very Good	The extra build quality over cheaper Denons is justified in terms of sound quality and lab performance, while the feature list is comprehensive and quite nicely presented.	Track entry/volume remote, menu display etc.	R	60
Denon DCD-1520 £500	Very Good Very Good	High tech, high profile, high gadget content, good sounding player at an almost affordable price.	Programme, hdp socket, remote, track entry, optical digital output	R	70
Denon DCD 1700 £650	Good+ Very Good	The overall sound was strong and coherent approaching reference standards. Fine build quality and facilities make this a firm contender	Remote, skip, scan, headphone socket, programmable	R	58
Denon DCD 3520 £1000	Very Good Good+	Built like a battleship this new model takes its place at the top of the Denon range with a smooth and powerful sound, quite free of graininess	Composite 20-bit DACs, full programming features	R	72
Denon DCD-3300 £1200	Good + + Very Good	Sounding tight and coherent though not significantly better than the cheaper 1700. Very well built and comprehensively equipped	Remote control, with volume, keypad programme, scan, search, headphone		51
Dual CD 1030 RC £170	Fair Fair	An up and down performance on test but it is hard to deny the overall value for a machine that includes remote control at this price	Remote, headphone socket, 2x 0/S, timeshared 16 bit	R	64
Ferguson CD007 £130	Good Fair	The cheapest recommendation in the test group; don't expect the earth but the value is good	Manual, digital output, headphone socket	R	64
Ferguson CD008 £150	Fair Fair	Not as strong as its relatives, sample fault perhaps? Though performance is fair enough overall	Remote, midi digital output, 2x 0/S, timeshare 16 bit		64
Goodmans GCD300 £129	Average Average	It may be adequately made, but with cheap good sounding players available this particular Goodmans isn't quite good enough	Programmable, skip, search, repeat		70
Goodmans GCD550 £199	Average + Fair +	A slow autochanger with a weakish lab performance but the sound is fair enough, the features good and the price is low	Remote, 6 disc autochanger, 2x 0/S	BB	64
Goodmans GCD555 £219	Average Average-	Scores approval on grounds of low price. You must pay more for better sound and a faster mechanism	6 disc changer, 32 track memory, remote etc	R	76
Grundig CD9000 £1000	Good Good	Aimed at a market which puts external styling above sound quality. Although this player is of slightly above average competence in most departments it is expensive	Remote, programme, hdp socket, calendar display etc		70



## THE DIRECTORY

## CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
JVC XL-Z1010 £499	Good Average—	Despite some high tech design and a good lab result this model did not deliver good sound quality	32 track prog., disp off, auto fade, 2 digital op		76
Kenwood DP-8010 £449	Good Fair	Top build quality and novel technological features seem to achieve little success here. While the technical performance is fine, the sound quality doesn't match its competitors	Track entry remote, memory display, sprung feet, optical digital output etc		70
Luxman D-90 £300	Fair Good	Despite technical ingredients that do not seem particularly inspiring, this is a nicely judged package that is ergonomically neater than most, with decent sound quality for the price and distinctive finish and presentation.	Track entry remote, programming etc.	R	58
Marantz CD583 £169	Very Good Good	Devoid of all but the CD essentials it makes up for in sound quality what it lacks elsewhere	Memory, track skip, search, etc	BB	70
Marantz CD85 £500	Very Good Very Good	This player may just miss a top sonic rating but it's well made and has plenty of features belitting a Marantz heavyweight	FTS, key pad remote, comprehensive display, programming, optical output etc	R	70
Marantz CD94/CDA94 £1600	Very Good Very Good+	This two-box combination delivers reference standard lab and listening test results, albeit at a price which seems a little steep. Very refined	Favourite track selection, remote, balanced output etc	R	60
Marantz CD12LE £2500	Very Good Excellent	This top of the range two-box player may be very expensive but it is very well made. Technical performance is very good and the sound is the best from Marantz yet	Two box, digital processor, FTS, optical connection, hdph socket, comprehensive display, balanced output etc	R	70
Meridian CD207 £1050	Very Good Excellent	The 207 matures with age and in its present form it offers one of the best sounds around plus great packaging and versatility through its preamp options	On-board preamp, options, two box, coax digital output, remote	R	72
Micromega CDF1 Classic £1400	n/a Very Good	A very well made and stylish player from France, the CDF1 is a CD player for analogue lovers or as close as we've come across	Basic remote, digital output, suspended chassis	R	72
Micro Seiki COM100 £3850	Very Good Good	One of the hernia inducing bricks of hi-fi, the Micro is extravagantly styled, finished and built. The good lab performance led to an 'only good' sonic display when the price demanded excellent	Balanced output, remote, display blanking		72
Mission PCM2 £500	Good+ Good	A matured design with good features it is the best sounding power volume player available, it even tests well. It accepts the £200 PSX power supply option	Remote volume, display and phase invert	R	64
NAD 5320 £169	Average— Average—	A low cost player devoid of features but at this low price it should still offer better sound	Budget facilities, 20 track program		76
NAD 5220 £230	Average— Poor	Conforms sonically to a stereotype of the medium that most players have grown out of. Hard, thin and raw sound with poor stereo and resolution.	Time/track display, memory		62
Nakamichi OMS-1E £395	Good Good	This neat enough player doesn't really follow the Nakamichi tradition of providing exceptional sound quality while at the same time perpetuates that of selling at an above average price	Simple remote etc.		58
Nakamichi CDP-2E £495	Very Good Good	It's ergonomically superior and has above average sound, but it isn't cheap. The standard of build quality and finish is first class which isn't quite matched by the sound quality	Programming, hdph, remote track entry, digital output		70
Nakamichi OMS-4E £1200	Very Good Very Good	Solidly controlled and comparatively simple this clearly represents one of the major benchmarks for CD sound quality, though the midrange sounded a touch thin	Skip and scan, headphone socket		51
Nakamichi OMS-5EII £1500	Good+ Very Good	"... delivers near state of the art performance and build quality in a deliberately starkly functional package, but at a very high price..."	Skip and scan, simple track programming, manual control		51
Nakamichi OMS-7EII £2000	Good+ Good	The only serious criticism here is of the price. And in our not always humble opinion you can get better sound quality for less elsewhere in Nakamichi's range	10 digit track entry keypad programming, headphones		51
Onkyo DX-1500 £170	Average Fair	Ruled out on the grounds of its poor DAC filter, but it's not so bad really given the price	Manual, 2x 0/S, timeshared 16 bit		64
Onkyo DX-3500 £250	Very Good Fair	It offers a lot of facilities and fine build quality for the money. Lab performance is very good but the sound quality doesn't inspire	Key pad remote, memory, hdph socket, comprehensive display etc		70
Onkyo DX-7500 £450	Good Very Good	This comes close to the state of the art performance in many areas. It has lots of facilities and is well made too.	Key pad remote, memory, hdph, very comprehensive display, optical digital output etc	R	70
Philips CD610 £160	Average+ Average	Built down to the price the sound is OK while the package performance and features constitute fine value	Remote, hdph, programming etc	BB	76
Philips CDC875 £300	Average+ Average—	The changer works well and this machine is very well equipped. The sound quality is below par but may not matter too much in its likely 'muzak' application	6 disc changer/dig op remote, hdph, memory, shuffle		76
Philips CDV185 £350	Average+ Average	Hard to value with the video singles facility but it all works well enough for a recommendation	Video singles + CD scart + digital out etc	R	76
Philips CD880 £500	Very Good Very Good	The '880 is an impressive blend of luxury build quality and features at a far from extravagant price, and also delivers the subjective goods.	Volume remote, FTS, menu display etc.	R	60
Pioneer PDM710 £350	Good Average	A fine multi-changer with excellent memory programming, fully featured, sounds fine but no digital output	6 disc changer, 40 track memory + multi memory full remote, hdph, etc	R	76
Pioneer PD9300 £450	Excellent Average	A mid price flagship of excellent build and lab performance but only average sound – interesting though	Remote, 24 track programming, 2 digital op		76
Pioneer PD-91 £800	Excellent Very Good+	Close to state of the art in nearly all areas – soundstaging, clarity and simple lack of artificiality. A well made and sophisticated player	Track entry remote, calendar display, index search, etc.	R	64
Proton AC-120 £180	Average Average—	Fine styling, low price but barely average performance	15 track memory, simple design, remote, hdph		76
Revox B126 £649	Very Good Good	Made in Switzerland so the build quality and technical performance is high but then so is the price and the sound quality is only good	Programming, Revox remote system compatible		70
Revox B226S £840	Good Average	Top quality build and finish for the Revox system enthusiast. For high value sound look elsewhere	Remote vol, hdph, 19 track memory, digital op		76
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
Rotel RCD855 £250	Good Good+	Stripped for action this well built Philips technology player delivers fine performance and sound. First rate value	Remote, 20 track prog, 1 audio op, 1 digital op	BB	76
SAE D102 £700	Good Good	Considering the high price of this player, most of the innards seem fairly prosaic. Sound quality and lab performance are both respectable enough, but hardly justify the price premium involved, though styling is unusual.	Remote (inc volume), skip, scan etc.		58
Sharp DX150 £129	Fair Fair	This is a none oversampled player which is rather outclassed for technical and sonic merit by the vast majority of the competition. Pretty enough but would you want to put discs in it?	Programmable, skip, search, repeat		70
Sharp DX750 £179	Fair Fair	It has a remote control but it's too like the 150 which is rather outclassed for technical and sonic merit by the vast majority of the competition	Remote, programmable, skip, search, repeat		70
Shure Ultra D6000 £495	Average+ Fair	Ergonomically well thought out with full function remote control, but not really scoring sonically considering its price	Remote control (full function inc volume)		51

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



# THE DIRECTORY

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
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/Coil
Sony CDP-M55 £190	Fair Fair	£20 buys a remote control handset to operate your M35. Sony call it an M55 (see CDP-M35 review)	Simple remote, skip, scan, programming etc.	R	58
Sony CDP-M75 £230	Good Good	This midi version of the '750 saves £20 on the price (see CDP-750 review)	Track entry remote, menu display ect.	BB	58
Sony CDP-C50M £250	Fair Fair	The Sony concept of an autochanger is interesting and executed with characteristic thoroughness. The lab and sound test results reveal it to be of only average quality	Carousel autochanger, remote, multi disc programming, variable hdph socket		70
Sony CDP-M95 £280	Very Good Fair+	Very well equipped mid sized player fine build and finish, incorporating Sony's custom file disc labelling	Remote, programmable, variable hdph output	R	64
Sony CDP-228ESD £400	Very Good Average+	Good value, this is Sony's best mid price design and comes superbly equipped	hdph, remote, rem vol, custom file	R	76
Sony CDP-338ESD £550	Excellent Good	Only a bit better than the 228 the 338 is a good machine, but not quite good enough for formal recommendation at the price	Custom file, remote, rem vol, hdph, shuffle etc, 2 digital op		76
Sony 557ESD £1000	Excellent Good+	Superbly built flagship model that produced excellent lab results and very good sound. Many luxury features though not that good value	Full remote, disc directory, digital output, power volume, 8x O/S, 18 bit		64
Sony CDP-X7ESD £1300	Good+ Average	A Sony flagship, build and finish is exemplary, styling is unusual but the sound is just average	Custom file, remote, 2 digital op, balanced audio + phonos		76
Sony CDP-R1/DAS-R1 £5000	Very Good Excellent	Sony has aimed high with the R1 and in some ways has created the reference player. Build quality is amazing and it offers a high level of facilities. One or two faults were revealed in both the lab and the listening, but it's generally excellent	Two box, dual optical connection, digital processor, FTS, remote		72
Stax Quattro £2995	Very Good Very Good	Now in mkII guise this substantial player recreated exceptionally strong and convincing bass lines together with a beguilingly musical midband	18-bit DACs, 20-track memory, full IR remote, variable o/p	R	72
Teac PD470LE £279	Average Average	With the LE upgrade the 470 has improved to a just average position	Remote, hdph, 20 track prog		76
Teac ZD880 £450	Good Fair	Decent enough in most respects with a very good build and finish. Its sound isn't competitive enough to inspire any real enthusiasm	Remote, track key access, auto space, comprehensive display, hdph socket etc		70
Technics SLP202 £160	Very Good Average-	A competent budget player; no frills but a good value performance and build quality. Buy the similar SLP227 if you want remote control	Simple facilities, 20 track program, no rem	BB	76
Technics SLP-333 £250	Good+ Average	A decent enough player lacking that final edge necessary for review distinction	Dubbing edit, hdph, digital out, rem vol remote, 20 track prog		76
Technics SLP-555 £300	Very Good Average	A well balanced, well made player delivered at a very fair price. Good facilities for cassette dubbing	Peak level detection, remote, rem vol, hdph digital op	R	76
Technics SLP777 £350	Very Good Average	A higher quality version of the 555, it may impress with its extra facilities. Performance is similar to 555	Display off, full remote, audio level meter, 32 track prog, hdph digital op		76

## CD MIDI SYSTEMS

So you want a hi-fi, but you don't want to make a fuss about it. A pre-packaged system with everything matching up and no aggravation may not rank with carefully chosen separates on sound quality, but there's no denying the attractiveness or popularity of this approach - the market for pre-packaged component hi-fi systems is at least as big as that for separate items, even ignoring the vast numbers of low-cost single unit stacker systems. The arrival of compact disc led to a new fashion for shelf-standing compact systems, or 'midis' as

they are known in the trade, as a replacement for earlier floor-standing rack systems (themselves the upmarket development from music centres). Only some 330mm wide, midis can more or less match full-size (430mm) rack components for performance, and are certainly cheaper to make, ship, sell and buy. Whereas specialist hi-fi is moving steadily towards ultra-simple 'no frills' components, midi systems tend to be sold on a feature count at a price point, usually with little opportunity for

demonstration and comparison. Our test programme includes extensive auditioning and lab testing, while making allowance for the different aspirations of designers and expectations of users. Key features valued highly by customers include system remote control, automatic switching, double 'dubbing' cassette decks, and elaborate equaliser tone controls. And the top end of the market is developing with surround sound audio/video-ready packages.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa X-D80K £550	Poor Poor	Congested and harsh sound quality, the cassette deck, amp and loudspeakers being well below par. The built-in timer adds some operational flexibility	Auto-reverse, CD synchro record, remote, timer		This
Aiwa X-D100 £1000	Average- Fair	Very fully equipped with wide ranging in and outputs but poor upgradeability. Sound quality is reasonable on the whole	Digital & optical in/outputs, dual auto reverse, disc file CD etc		This
Akai M.50CD £550	Poor Poor	Cassette lacks Type II compatibility, general sonics mediocre or less	Devolved from M.80 but simplified, part remote		65
Akai M.80CD £800	Good Good	Good all rounder with minor ergonomic shortcomings but generally practical layout	Separates based, twin auto-reverse cassette	R	65
Ferguson HFD28 £300	Poor Poor	Similar to Goodmans 5000 system but with greater power and marginally superior sound	One-piece, semi-remote		This
Goodmans 5500 £320	Poor Poor	It offers the basic features (but no Dolby or magnetic cartridge) and rough and ready sound	One-piece, remote		This
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
Grundig Studio Line 1 £330	Poor Average+/ Poor	Intriguing package with warm, woolly but attractive sound let down by poor attention to detail and suspect cassette deck. Amplifier appears to be inadequately protected	CD/cassette tuner plus preset equaliser		This
Hinari DK200 Disc Deck £300	Poor- Poor-	Confused user interface is matched to inadequate electronics. Poor - and poor value	Single unit, two cassettes, CD, tuner, remote		This
JVC Midi-W900CD £1000	Good Good+	A competent allrounder, with important convenience related features, and powerful linked recording facilities. Less strident speakers would be appreciated	Separates system, equaliser, auto-reverse cassette	R	65
JVC Midi-W91CDM £1111	Good- Average	Very well equipped (viz: multi-disc player, powerful tape related features) with acceptable but rather nondescript sound	Multi-disc player, twin auto-reverse cassette, equaliser		This
Marantz MX493AVCD £549 with LD20 speakers, £449 without	Average Mixed	Good source components (ex cassette) let down by poor amplifier. Flexibility is strong point, and the system may prove attractive where the A/V possibilities can be fully utilised	Twin auto reverse, opt speakers, surround processor etc	R (with LD20)	This

## TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

## THE DIRECTORY

## CD MIDI SYSTEMS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Marantz MX583 £750	Average— Poor	The system has potential in an A/V context, but is patently lacking in a purely audio one. Only the CD excels	Component system with AV amp, no speakers		65
Marantz MX673CD System £900	Average+ Average	Tremendously flexible audio/visual system. Sound quality is satisfactory at best and ergonomics a mess	Various A/V inputs, remote, speakers optional		54
Pioneer S-11 £510	Average— Average—	Fine lower middle market system, with one useful extra — the built in timer. Only the record deck is disappointing	Twin auto reverse cassette, built in timers, one piece amp/cassette		This
Pioneer S-330D £1080	Very Good Very Good	High standard of reproduction on all sources, though mistracking with Dolby C was a limitation. There are few gimmicks and plenty of fine engineering	Dolby C/HX Pro, multi-disc, amp with DAC etc	R	This
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 worryingly sounding amplifier	One piece CD, cassette, tuner and amp, remote	R	65
Sanyo 39CD £260	Poor Average—	Acceptably compromised basic low end system, offers broadly respectable if unambitious music making for those on a tight budget	One piece + CD, non-remote, manual tuner		This
Sanyo 49CD £300	Poor Average—	Similar to 39CD, but with Dolby B, preset tuning, remote control and more power. Audio wise, it's more of the same, but there's greater stature when loud and cassettes are helped by Dolby B	One piece + CD, partial remote control, digital tuner	R	This
Sanyo 59CD £380	Average— Average—	Adequate performance overall, though endemic lack of pitch integrity takes edge from tape and records. Some inconsistencies in control system too	As 49CD, + full remote, auto source select, separate turntable		This
Sharp CD-X17E £550	Average Average+	Highly specified miniature with detachable speakers. AC mains power only. Good sound let down by crude upper midband and treble. Expensive for what it is	CD luggable with dual cassette & tuner, detachable speakers		This
Sharp SA-CD800H £700	Average Average—	A superficially high grade, high spec system, the SA-CD800H actually sounds clean but a little 'synthetic'	One-piece, 6-disc CD, no T/T		54
Sony Compact 301CD £400	Average— Average	Mainly crisp, articulate sound and excellent ergonomics offset by modest FM results and lack of pitch integrity on cassette	Twin unidirectional cassette, equaliser, 30 preset tuner etc		This
Sony 501CD £500	Average Average	Fair all round performance except noisy FM. Ergonomics and visuals good, but no auto source select, tuner stereo defeat	Twin auto-reverse, 3-band tuner, equaliser etc		This
Sony Compact 500CD £550	Average+ Average+	Impressive visuals are matched to electronics which in audio terms lack inspiration. The speakers are particularly poor	Combined amp/cassette, 36 preset tuner, T/T component CD		65
Sony Compact 700CD £700	Average+ Good	Loudspeakers and (to a lesser extent) turntable spoil a fine sounding and stylish — if rather costly — package	Separates system, auto reverse cassette, 36 preset tuner		65
Sony Compact 701CD/711CD £700/£800	Average+ Good	Sound quality good all round, though cassette pitch accuracy is below par. Features average but system control is weak	Twin auto-reverse, graphic equaliser (711 only), 30 preset tuner	R (701CD)	This
Sony Series 1000CD £1500	Very Good Excellent	Very sharp, articulate sounding system from CD and FM. Cassette deck good and flexible, turntable as usual is not in keeping	Separates system, twin auto-reverse cassette, amp with DAC	R	65
Technics X900CD £470	Average Average—	Good build and mostly good sound is offset by mediocre amplifier and loudspeaker and some operational oddities	Main cassette/tuner/amp, separate T/T and CD		65
Technics X1 £500	Good Good	Superb value for money from a system with solid straightforward engineering at an attractively low price	Auto-reverse record transport, auto-disc/tape editing, surround sound, remote	BB	This
Technics X5D £800	Very Good Very Good	A mainstream system offering considerable flexibility and power in a traditional suit of clothes, and embodying values that place music first	Twin auto-reverse, tuner/timer, auto record deck, digital amp	R	This
Yamaha AST-C10 £600	Average+ Very Good	Brilliant if flawed luggable with weighty, powerful bass, and a rare combination of expressiveness and clarity unprecedented from such a small package. Good features.	Mains portable twin cassette/CD/radio system detachable speakers, remote	R	This

## TUNERS

The radio medium operates at a much lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live Prom concerts can rival all other sources from a hi-fi perspective. Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for receiving certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen amplifier

cosmetically. However, the task they carry out is far from simple (or cheap), combining the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on local reception conditions, but money invested in a high quality outside aerial system is well spent.

Tuners come in two basic types. Analogue models tune gradually (and usually manually) across

the bands, and can have analogue or digital displays; they are often preferred for sound quality, and are certainly best for AM bands. Digital tuners offer convenient automatic tune facilities and hold many station positions in pre-set memories.

(The Lab and Sound results for models tested in issue No. 65 refer to FM only. For AM results see under Comments.)

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai AT-52L £150	Very Good Very Good	Holds its own on FM against many much more expensive tuners, but AM is very poor	All bands	BB	65
Akai AT-93L £250	Good+ Good+	By AM standards presentable (good) while FM delivers the goods	All bands, aerial switch	R	65
A&R Arcam Alpha £149	Good Average++	Attractively classic British analogue tuner with sound quality comfortably better than most	FM/AM Analogue	BB*	50
A&R Arcam Delta £270	Very Good Very Good	Hi-fi sound on FM, good on AM, a dependable British all-rounder	6AM, 6FM presets, FM/MW, LW display manual tune	BB	55
Denon TU 45DL £130	Average+ Average+	Poor AM sound quality may be a deterrent but the FM performance fully merits recommendation	FM/AM Digital MW/LW	R	50
Harman Kardon TU920 £299	Good Average	Rather weak sound quality for the price despite good lab test results	16 presets, AM/FM, digital auto scan, active tracking		55
Harman Kardon Citation 23 £559	Good Very Good	Fine performance, interesting features and ease of use are this tuner's forte, and the sound quality is top notch	FM/AM seek/manual adjustment, 16 presets, remote control	R	60
Hitachi FT-MD 5500 £200	Excellent Good++	A powerful, good sounding tuner with versatile facilities	16 presets, FM, AM, MW auto scan digital, signal meter	BB	55
Kenwood KT-660L £130	Fairly Good Fairly Good	You get your money's worth of gadgets and the radio's basically sound although programming is complicated. AM — fairly good	Timer, clock, all bands	R	65
Kenwood KT-1100D £300	Good+ Good+	Behind a gaudy and rather useless display the radio is much better than you might first think. AM — good	Firework display, FM/MW bands only	R	65
Linx Theta £400	Good Very Good	A Magnum Dynalab on the cheap with the hallmark styling of this small British newcomer. Some of the best midrange from any tuner	Manual analogue tuning, no presets, signal strength meter	R	72
Magnum Dynalab FT101 £599	Good Very Good	Although expensive for its fairly minimum set of facilities its excellent sound makes up for what it lacks elsewhere	Analogue manual tuning, no presets, signal strength meter	R	72

## THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

# THE DIRECTORY

## TUNERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Marantz ST35L £125	Good+ Average-	It works well enough but the sound could be better for the money	16 presets, AM/FM, digital auto scan, active tracking		55
Meridian 204 £525	Good+ Good	Pleasant sounding with a fine finish but does not make the grade at this price	FM only, auto scan, digital, remote, clock timer		55
Musical Fidelity TI £300	Good+ Very Good	Top class FM stereo sound on good signal strengths from this audiophile model. Watch out for local CB!	FM only, analogue box dial, manual tune, signal meter	R	55
NAD 4020 £139	Good Average+	Not the quietest or most sensitive tuner tested, it still provided good sound for the money, being "musical and ambient"	Analogue FM/AM	BB	50
Naim NAT01 £1098	Very Good Very Good	There may be better sounding tuners in the world, but we have yet to hear one	No presets. Two box, flywheel tuning FM only, Analogue	R	50
Nakamichi ST-7E £750	Good+ + Good+	Exceptionally good for weak-signal areas, and good all round	16 AM/FM presets, Schotz enhanced sensitivity, auto time digital		55
Onkyo T9090 II £590	Very Good Very Good	It has most of the facilities you could possibly want and more beside. Lab performance and sound quality are both good enough to ensure recommendation even at this price	FM only, digital, 20 presets, auto scan etc.	R	72
Pioneer F91 £350	Excellent Good+ +	Easy to use, this model has excellent RF performance and scored very high ratings on the listening tests	FM/AM 24 presets	R	60
Proton AT-300 £199	Good Good	The AT-300 is pretty on the outside, orthodox on the inside and rather dear. AM - poor	FM/MW only	R	65
Quad FM4 £289	Very Good Good+	Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7 presets. Digital	R	50
Revox B260 £918	Excellent Very Good	Sophisticated and expensive, the B260 is ideally suited to the rest of the Revox range and should also work well in other systems	FM - virtually everything	R	60
Rotel RT-830AL £110	Good+ Good	Fine sounding budget audiophile material, no frills, no fuss	Manual dial analogue, FM, MW, LW	BB	55
Rotel RT-850AL £160	Good+ Good+	Scoring well on listening tests and one of the best sounding tuners at its price level, it was a bit let down on AM but RF performance was good	FM/AM, digital	BB	50
SAE T-102 £449	Good+ Good+	Expensive for all the radio you get, but sounds interesting. AM - Poor	FM/MW only	R	65
Sony ST-S300L/ ST-S100L £140/£100	Good Good	A reasonable entry point, not for difficult areas. AM - Poor	All bands	R	65
Sony ST 500ES £200	Good+ + Average-	Disappointing sound quality but good lab performance. (Includes long wave)	10 AM/FM presets, auto scan digital		55
Sony ST-S 700ES £299	Very Good Very Good	First class in every respect including FM sound quality. Even AM was well above average	FM/AM, 10 presets, digital scan	BB	60
Yamaha TX-L400 £130	Good+ + Good+	Good FM sound, let down by poor AM but otherwise good value	16 presets, auto scan, digital, FM, MW, LW	BB	55
Yamaha TX-500 £150	Average+ Average	Under a gaudy coat, this sensitive tuner gave reasonable stereo results. However, the AM had again been thrown down a well	20 presets (10 buttons) digital		50

Rating refers to original, tested model

## HEADPHONES

There are a variety of different approaches to headphone design, and examples of each turn up in this group. Amongst the more expensive esoteric models, electrostatic drivers are used in square open-backed phones such as the Jecklin and Stax models. The majority of these come with some form of transformer which takes the signal initially from the speaker terminals on the amplifier. The actual speaker cables then travel from this unit via a

bypass switch to the loudspeakers.

The more down to earth models feature dynamic drivers in circular open-backed designs. The advantage of open backs seems to be a correspondingly open sound and a less claustrophobic feel to the music. One can also of course hear external noises and irritate people on public transport.

The third category are closed-back designs,

which are useful in situations where it is necessary to block out background noise.

Another means of distinguishing different types is the way they sit on your head or ears. There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs press on the outer ear (pinna); and intra-aural types rest inside the ear and are popular amongst users of personal stereos.

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Aiwa HP-X30 £30	Good Good-	A flashy personal stereo phone which alternatively could be used at home. A slight LF tonal preference slightly colours the response, but it ain't a bad can	Supra-aural, closed-back, dynamic		75
Aiwa HP-V99 £50	Good- Average+	Horn loaded in-ear miniatures with plenty of guts but not enough transparency or bass to compete with the headbanded competition	Intra-aural, closed-back, dynamic		75
Aiwa HP-X80 £50	Good Good	A headphone that's highly suited to non acoustic music and portable sources, nicely made and slickly finished. Sound quality doesn't quite match the price	Supra-aural, closed-back, dynamic		75
Aiwa HPEX-200 £90	Good Good	Modern looking and well finished the Excelias, as they are dubbed, had meaty bass and sounded reasonably open for the type	Circumaural, closed-back, dynamic		63
AKG K135 £35	Poor Fair	Despite a very appealing design the K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural, semi-open, dynamic		63
AKG K154/S £58	Good+ Good+	Electrostatic tweeters combine with a dynamic mid/bass unit to create very confident sounds in a comfortable headphone. Balance is on the bright side	Supra-aural, semi-open, electrostatic/ dynamic	R	75
AKG K240 Monitor £60	Very Good Good	Something of a classic these AKGs are very user friendly in all respects: sonically on the warm side of neutral	Circumaural, semi-open, dynamic	R	63
AKG K280 Parabolic £110	Good Very Good	A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural, open-backed, dynamic	R	63
AKG K340 £136	Good Excellent	Heavyweight cans in most respects, the K340 with its electrostatic tweeter is a very revealing headphone. Gives the total electrostatics a good run for their money	Circumaural, closed-back, electrostatic/dynamic	R	75
Audio Technica ATH 909 £55	Average Average	Quite impressive in the treble though a bit bass shy, the 909s worked well at highish levels	Circumaural, semi-open, dynamic		55
Audio Technica ATH 910 £65	Average Good	The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural, closed-back, dynamic	R	55
Audio Technica ATH-911 £75	Very Good Very Good	Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural, open-backed, dynamic	R	63
Beyer DT 325 £30	Very Good Fair	Lightweight in more ways than one, the 325s may be a little bright for some systems and tastes but will suit duller sources	Supra-aural, open-back, dynamic	R	63

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14



## THE DIRECTORY

## HEADPHONES

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
<b>Beyer DT330 Mk II</b> £45	Good Poor	Not the most revealing 'phones encountered, the 330s were nevertheless enjoyable and rarely offended	Circumaural, semi-open, dynamic		55
<b>Beyer DT550</b> £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
<b>Beyer DT880</b> £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
<b>Beyer DT990</b> £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
<b>Beyer IRS690</b> £200	Good+ Very Good	High quality infra-red headphones with soft comfy earpads and mellow but informative sound quality which is hard to dislike	Circumaural, open-back, dynamic	R	75
<b>Jecklin Float Model One</b> £79	Good Very Good	Whilst very unusual in appearance the Floats give remarkable sound quality and openness at a reasonable price	Circumaural-ish, open-back, dynamic	BB	55
<b>Jecklin Float Model Two</b> £99	Good Very Good	Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. Note lack of adjustment means you should try before you buy	Circumaural-ish, open-backed, dynamic	R	63
<b>Jecklin Float Electrostatic</b> £399	Good Excellent	One version of the state-of-the-art, these electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural-ish, open-back, electrostatic	R	55
<b>JVC HA-D990</b> £65	Good+ Good+	Good looking well made cans that offer good sound quality for the money. Sonic nature is of the easy-going, laid-back variety	Supra-aural, closed-back, dynamic	R	75
<b>Koss TD/60</b> £20	Good Average	Although they're devoid of channel identification and have a decidedly Stateside approach to sound, these are very listenable phones for the price	Supra-aural, closed-back, dynamic		75
<b>Koss K/6X Plus</b> £30	Fair Poor	'Sixties-style' phones from the good ole US of A, their sonic style is unique and can make a system sound quite different	Supra-aural, closed-backed, dynamic		63
<b>Pioneer SE-72</b> £30	Good+ Average-	Neat, nicely made personal stereo oriented phones along the lines of Sony V3s. Sound is on the veiled side, good for aggressive sources	Supra-aural, closed-back, dynamic		75
<b>Quart Phone 30</b> £40	Good Fair	Whilst not as seductive as their PMB25 predecessor the 30s are reasonably neutral and do improve on some of the competition - though not stunning	Circumaural, semi-open, dynamic		63
<b>Quart PMB 25II</b> £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
<b>Quart Phone 70</b> £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
<b>Quart PMB 65</b> £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
<b>Quart PMB 85</b> £90	Fair Very Good	These more expensive Quarts bear a striking resemblance to the Jecklin Float models and use two drivers per ear. Sound is a bit bass heavy but not bad overall	Circumaural, open-backed, dynamic		63
<b>Realistic Pro-X</b> £25	Poor Average-	Robust, unanimously uncomfortable and heavily veiled in sonic terms - not a great success	Supra-aural, closed-back, dynamic		75
<b>Ross RE2530 CD</b> £20	Average Average	Rather an 'average' £20 phone that some found uncomfortable due to high pressure on the ears. Sonic balance is on the bright side	Supra-aural, closed-back, dynamic		75
<b>Ross RE2560 CD</b> £25	Good Average+	If you're not too fussy about quality of finish and don't have an elfin head then these British phones warrant attention. Sound could be smoother	Supra-aural, semi-open, dynamic		75
<b>Ross RE-2760</b> £35	Poor Fair	Stylish white cans from the only British firm in the business. Unfortunately sound quality is not up to par in this price range	Supra-aural, closed-back, dynamic		63
<b>Sennheiser HD30</b> £13.50	Good Poor	Built specifically for the personal stereo market these small and light Sennheisers have a slightly synthetic sound, but are an upgrade on the average Walkphones	Supra-aural, semi-open back, dynamic		55
<b>Sennheiser HD40</b> £18	Very Good Good-	Very light and comfortable headphones with an even sonic balance that will suit most sources, but jack is 6.3mm and not suited to personals	Supra-aural, semi-open, dynamic	BB	75
<b>Sennheiser HD450</b> £27	Good Fair	Modern, simple and lightweight phones that are remarkably robust and which turned in a relaxed if weighty performance that was at worst pleasant	Supra-aural, semi-open, dynamic	R	63
<b>Sennheiser HD480</b> £37	Good Fair	Using the same shell as the 450s, the 480s were a little softened and unrevealing by comparison with their competitors	Supra-aural, semi-open, dynamic		63
<b>Sennheiser HD420SL</b> £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
<b>Sennheiser HD520</b> £60	Good+ Good+	A very comfortable and musically capable headphone. If you've got this sort of bread to blow on cans, give 'em a blast	Circumaural, semi-open, dynamic	R	75
<b>Sennheiser HD530</b> £70	Very Good Good+	One of the better dynamics in its group, the 530s create a sense of space that eludes most sub £100 cans, and they're dead comfy to boot	Circumaural, semi-open, dynamic	R	75
<b>Sennheiser HD540 Ref Gold</b> £160	Good Very Good	The 540 Golds prove that dynamic headphones can be subtle, informative and capable of creating a remarkable sense of space	Circumaural, open-back, dynamic	R	55
<b>Sony A21L</b> £20	Good- Good-	Forward facing in-ear drivers on a folding plastic band provide exceptional clarity for such an inexpensive phone. However, no bass, and fit isn't to everyone's taste	Intra-aural, semi-open, dynamic	BB	75
<b>Sony MDR V3</b> £30	Fair Good	Portable stereo oriented phones that are very nicely made and combine clarity with a pleasant lack of distortion	Supra-aural, closed-back, dynamic	BB	63
<b>Sony MDR-V5</b> £50	Very Good Average+	A nicely made comfortable headphone let down by a limited ability to reproduce music in a natural fashion	Supra-aural, semi-open, dynamic		75
<b>Sony MDR V7</b> £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
<b>Sony MDR-CD999</b> £120	Good+ Very Good	A very nice headphone in all respects, the 999s are worthy of the best headphone outputs and high quality sources	Supra-aural, semi-open, dynamic	R	75
<b>Sony MDR-R10</b> £2500	Excellent Very Good+	Costly state of the art sealed moving coil design built to the highest standards using the finest materials. Sound quality reflects this care, being big, clear, sweet and refined	Circumaural, closed-back, dynamic	R	72
<b>Stax SR34</b> £140	Fair Very Good	The least expensive Stax headphones around, the SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural, open-back, electret		55
<b>Stax SR84</b> £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
<b>Stax Gamma pro/SRD-X pro</b> £296/£230	Very Good Excellent	The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural, open-backed, electrostatic	R	63
<b>Stax SR Gamma</b> £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
<b>Stax SR Lambda Pro</b> £545 (inc. SRD-7SB Mk 2 Adaptor at £185)	Very Good Very Good	A bit of an industry reference the Pros are frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural, open-back, electrostatic	R	55

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



# THE DIRECTORY

## HEADPHONES

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Stax SR Lambda Pro £360/ SRM-1 energiser £635	Very Good Excellent	This combination extracts layers of information that other headphones only hint at. The SRM-1 has more edge than the SRM-T1, but it's good	Circumaural, open-back, electrostatic	R	75
Stax Lambda Signature/SRM-T1 £470/£895	Very Good Excellent	The Signature when combined with the SRM-T1 valve driver must be the most transparent headphone available	Circumaural, open-backed, electrostatic	R	72
Yamaha YHL-006 £30	Average Average	Unusual personal stereo oriented phones that curl up when not in use. Earphones are like golf balls and balance is well suited to Walkmans	Supra-aural, open-back, dynamic		75

## PERSONAL STEREO

Whilst not exactly hi-fi components, personal stereos probably play more music to more ears than all manner of domestic systems and as such demand some attention. Now that personal CD players have joined the ubiquitous Walkman in the market, the variety and standard of sound quality is huge, with obscurely named cassette players practically falling out of your cornflakes packet and Discmen going for £300.

Despite their diminutive size personals attempt to incorporate as many gimmicks and features as

possible, cassette players often incorporating tuners, graphic equalisers and Dolby noise reduction. CD players are still relatively expensive and don't tend to vary that much on the features front, rather the amount and quality of accessories differs. Most models come with a mains adaptor and some include remote control.

Sound quality on the cassette front seems to have a proportional relationship to price and integrity of construction – wow and flutter being quite obvious on the cheaper models. CD players

become less noisy as they get dearer and also reduce in size; one drawback of the latter seems to be that immunity to shock suffers as a consequence. Cassette players do, on the whole, seem better suited to the outdoor life than their digital counterparts, as does the software. Bear in mind that the sound and lab ratings given below cannot realistically be compared to those in other categories or between cassette and CD personals.

## PERSONAL CASSETTES

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
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
Sony Walkman Pro £249-£289	Good+ Very Good	One of the finest sounding cassette decks on the market today. A mandatory Best Buy, it takes other personals to the cleaners (except on weight and power consumption)	Dolby B, C, types I, II & IV, record, line in/out, varispeed		52/56

## PERSONAL CDs

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Goodmans GCD-10 £120	Average- Poor	Cheap, flashy and not short on accessories the GCD-10 is a rather noisy player that left a lot to be desired on the sound quality front	13.5 x 3.7 x 18cm, 478g, mains adaptor		66
Kenwood DPC-77 £270	Good+ Very Good	Very chunky and well made, the DPC-77 is the only player to include a digital output and sounds very good through its analogue output – a suitable domestic alternative	12.8 x 3.5 x 14.5cm, 750g, digital output, mains & in-car adaptors	R	66
Philips D6800 £130	Average Average-	A competitively priced and reasonably attractive looking player whose sonic performance is somewhat marred by a rather grainy top end	13 x 4 x 17.5cm, 516g, 3" ready, twin hdph sockets		66
Sanyo CP-12 £260	Fair Good+	Sonically amongst the more enjoyable personal CD players and capable of revealing the musical aspects of a disc in an interesting and entertaining fashion	12.5 x 2 x 12.7cm, 380g, wired remote, mains adaptor	R	66
Sony D-20 £150	Average+ Fair	Not bad for a machine at this price, it's nicely designed and reasonably robust, with reasonable sound quality	13.8 x 3.8 x 15cm, 450g, mains adaptor	R	66
Sony D-88 £300	Average- Fair+	A stylish and 'cultish' object, the D-88 is very small and has an adjustable disc drive for three and five inch discs. Sound quality doesn't quite match appearance	9.4 x 3 x 9.8cm, 300g, 3" ready, mains adaptor, no line out		66
Sony D-150 £300	Fair+ Very Good	One of the most enjoyable machines encountered, sounding informative and sweet and looking very tasty to boot. Comes complete with a tough carrying case	12.6 x 2.1 x 13.5cm, 420g, 3" ready, R mains adaptor	R	66
Xenon CDP-03 £180	Average- Fair+	A well made and competitively priced machine that is ergonomically spoilt by flat slightly unresponsive buttons. Sound quality ain't too bad but a trifle boring	12.6 x 2.7 x 12.6cm, 560g, high frequency filter, key lock		66

To Advertise in  
this space ring Miriam Young  
on 01-631 1433

# THE DIRECTORY

## CD PORTABLES

CD Portables or Yuppie Blasters as we classified them are basically portable stereos gone digital, ie a compact disc player is included alongside the usual AM/FM radio and single or double cassette deck. Compact disc is a novelty that seems to add a fairly hefty premium onto the price of the standard ghetto blaster, but the improved sound quality over standard cassettes may justify this for some. In virtually every case a CD output socket is

fitted which means that it's possible to play silver discs through a domestic amplifier and loudspeakers, thus they are some sort of substitute for standalone mains machines (as are the personal CD players). One drawback with having a CD player on board is that batteries are gobbled up even quicker than usual, up to ten batteries being required in some cases. Neither are the units particularly light, the heaviest weighing eight kilos!

However they do all run off the mains too, and come with an appropriate lead for this purpose. Other useful features common to most are spare input sockets to record from an external line source such as a preamplified vinyl disc signal, and microphone sockets for recording live events (although the usual lack of record level adjustment is a nuisance).

MODEL PRICE	SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa CSD-XL25 £150	Poor	It's cheap, cheerful and not too low on features but sound quality from disc is frankly uninspiring.	Twin headphone sockets		73
Bose Acoustic Wave £750	Very Good	Not exactly a CD portable as it doesn't play discs, but a highly versatile and stylish radio cassette player that has bass	Input sockets, Dolby NR, PA capable etc	R	73
Grundig RR9000CD £300	Average	Relatively slick machine with full CD function and volume remote control, low on features for price and unspectacular sounding	Remote, motorised volume pot, condenser mic		73
Philips AZ8394 £200	Average—	Stylish in a wasp like fashion, unfortunately the disc playing lets it down somewhat but otherwise it's OK	Twin decks, graphic eq., bass boost, condenser mic		73
Sharp QT-CD43 £280	Average	Quite a beefy box that comes complete with remote control for volume and CD functions. It even has a surround sound option which enhances imaging	Clock, speaker outputs, powered volume pot		73
Sony CFD-D73 £280	Good	The model we received was intended for the Japanese market and thus may not be entirely representative but it made reasonable sounds and has novel features	UHF bandwidth, input sockets, graphic eq., Megabass	R	73
Sony CFD-DW83 £300	Average	A macho looking beast capable of highish levels, but unimpressive sound for the price. Nice styling and good for scratching	Clock, timer, balance, input sockets, graphic eq.		73
Toshiba RT-8089 £200	Poor+	Square and long but rather drab on the sound quality front, as well equipped as most but rather tinny in many respects	Clock, twin decks		73
Toshiba XR-9458 £250	Average+	Accompanied by a plethora of accessories including a meaty plinth and infra red remote the Toshiba didn't quite make it on the sound quality front but is worth considering	420g, 2 remotes, mains adaptor, 3" ready etc.		73

## STANDS AND SUPPORTS

It's becoming more and more apparent that all the components in a hi-fi system benefit from being placed on the right kind of support. It is already acknowledged that performance of electro-mechanical transducers, such as turntables and loudspeakers, can be greatly improved by using highly rigid supports. This notion has been expanded to include electronics such as amplifiers and compact disc players, and inevitably a broad range of stands and supports have been produced to cater for this requirement.

With loudspeaker stands there seems to be two

broad schools of design. The most common is the open frame type which uses square section steel tubing (usually less than an inch square) made up to form a tripod or quadropod stand usually fitted with spikes top and bottom to ensure good coupling to both floor and cabinet. However, for reasons of domestic harmony this latter option is often not pursued as eagerly as perhaps it should be. The alternative approach is to use mass. Larger section (approximately 3 inch x 2 inch) tubing is welded between square top and bottom plates and filled with sand and/or lead shot. Again, this type uses

spikes at the base but Blu-tack or the like for coupling with the speaker cabinet.

Equipment supports generally place isolation quite high on the list of priorities and usually use a lightweight steel frame to support an MDF platform. Once again spikes are used to minimise contact with the platform and ensure good coupling to the floor. Minimising weight without compromising rigidity seems to be the aim with turntable supports but those designed for electronics often employ some form of damping to kill vibration, sometimes in the form of mass.

## LOUDSPEAKER STANDS

MODEL PRICE	TYPE FINISH	COMMENTS	TOP PLATE SIZE HEIGHT	VALUE	BACK ISSUE FULL REVIEW
Appolo 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
Appolo A10 £47.25	4 leg Fair	A robust and lightweight model, it would make an ideal upgrade for those still happy with the big boxes of old.	19 x 19cm 44cm	R	58
Foundation Fred £65	2 leg Average	With sand filling the Freds made speakers sound tight and coherent with a more even balance.	19 x 19cm 36/43/59cm		58
Foundation Maggi £159	Pair Very Good	Made for Magneplanar and other similar panel speakers they seem to have a healthy effect on the sound quality thereof.	50 x 2cm 2cm	R	58
Foundation Pi £250	2 leg Very Good	Overpriced in material terms the Pi nevertheless has a very positive effect on the low frequency performance of conventional speakers.	20 x 20cm 25/38/46/53cm	R	58
Heybrook Point 5 £50	3 leg Very Good	An unusual triangulated open frame stand that can help certain speakers sound more transparent and fluent — a good value stand	23 x 21.5cm 47cm	BB	58
Heybrook HBS1 £75	4 leg Very Good	With its new aluminium base frame the HBS1 fared very well in the listening tests. It allowed much of the speakers own 'sound' to remain intact.	23 x 21cm 47cm	R	58
Linn Kan II £79	4 leg Very Good	Built to support Linn's Kan speaker this stand is well suited to the task, but is less successful with other loudspeakers.	19 x 16cm 59cm		58
Linn Sara £85	4 leg Very Good	The Sara exhibits some odd properties so its use other than with the Sara loudspeaker should be viewed with caution.	25 x 21cm 53cm		58
Monotrak Engineering M1 £58	1 leg Good	The M1 gave the mid and treble a commendably smooth and detailed presentation but bass sounded rather lacklustre and muddy.	19 x 18.5cm 48cm		58
Monotrak Engineering M4 £58	4 leg Very Good	Begging comparison with Heybrook's HBS1 the M4 maintained much of the openness and forthright detail of that model.	23 x 21.5cm 53cm	R	58
Monotrak Engineering M4S £58	4 leg Very Good	Its stature and stability would seem to mark it out as most suitable for smaller, lighter cabinets. The M4S possessed an open midband and clear treble.	20 x 17.5cm 53cm		58
Mordaunt-Short IS1 II £45	3 leg Good	Suited to low mass speakers, preferably using spikes to effect coupling, they sounded slightly 'jazzed up' but the overall sound was quite unmodded.	18 x 15cm 56cm	R	58
Origen 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 in fill 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 II's nevertheless still need some careful re-examination by Partington.	17.5 x 16.5cm 63cm		58

# THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

# THE DIRECTORY

## LOUDSPEAKER STANDS

MODEL PRICE	TYPE FINISH	COMMENTS	TOP PLATE SIZE HEIGHT	VALUE	BACK ISSUE FULL REVIEW
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 TCS5 £50	Table Very Good	A little too close to the ground for comfort, perhaps, but this novel and stylish little table is certainly worth seeking out.	29 x 43 x 33cm	R	57
Cornflake TCS6 £50	Shelf Good	A squat and rigid frame supports a Medite top board with four adjustable spikes, better suited to suspended sub-chassis turntables.	43 x 23 x 33cm		57
Delttec 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
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 Very Good	ANS scored a hit with its transparent midband and revealing but quite unforced treble quality. Bass transients were slightly softened.	Silver signal & Copper screen	R	59
Audionote Silver ANV £140	Poor Very Good	Far weightier-sounding than the flexible ANS, ANV interconnect also possesses a fair degree of treble clarity and sparkle.	21 strand silver Litz		59
Aural Symphonics N/A in UK	Poor Good	This cable enjoyed an open and transparent midband and sounded remarkably neutral and faithful to the source.	OF copper PTFE dielectric	R	59
Budget Patch Cords see text	Fair Poor	As thrown in gratis with cassette decks and the like – frequency extremes were restricted and performances were veiled.	Thin coaxial		59
Budget OFC circa £7	Fair Fair	Subjectively, this cable did lift much of the aural fog experienced with scrawny standard hook-up leads.	OFC		59
Delttec 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

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

INTERCONNECT CABLES EQUIPMENT SUPPORTS LOUDSPEAKER STANDS HI-FI CHOICE

## THE DIRECTORY

## INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>Deltec Black Slink</b> £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
<b>Denon LC-0FC</b> 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-0FC, non-magnetic gold plated plugs		59
<b>DM Solid-core</b> £15-£25	Fair Good	Transparent in the midband and full of sparkling detail in the treble, low bass was slightly curtailed (unterminated price £2.30 per m.)	Single strand nickel-plated copper. Unshielded	R	59
<b>Kimber Kable PSB</b> £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
<b>Kimber Kable KC-1</b> £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
<b>Kimber Kable KC-AG</b> £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
<b>MDM Interconnect</b> £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
<b>MIT PC-Squared</b> £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
<b>MIT Spectral MI330</b> £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
<b>Monitor PC D100381</b> £17	Good Fair	There is more than a hint of instrumental muddling and bass is slightly soft, however, the slightly 'shut-in' sound is par for the course at the price.	OFC, coaxial	R	59
<b>Monster Interlink 400</b> £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
<b>Monster Interlink CD</b> £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
<b>Monster Interlink Reference</b> £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
<b>Myst Tm</b> £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
<b>Origin Live Soli-Core Super</b> £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
<b>QED Incon P1-Gold</b> £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
<b>QED Incon Graphite GP1 Gold</b> £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
<b>Sony RK-C310ES</b> £40	Excellent Good	Possessing deep firm bass and a sparkling top end it offers a balanced perspective with negligible coloration.	Coaxial LC-0FC	R	59
<b>Sterling</b> £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
<b>Thorens SAC 100</b> £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
<b>Van den Hul MC-D300II</b> £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
<b>Van den Hul MC-1021II</b> £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
<b>Van den Hul MC-D502</b> £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
<b>Van den Hul Thunderline</b> £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
<b>Van den Hul MC-Gold</b> £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
<b>Van den Hul MC-Silver</b> £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
<b>Vecteur 8045</b> £49	Very Good Good	Sounding solid and forthright it might seem slightly cold in some systems but the treble 'edge' is mercifully clean. Very low frequencies were a little lacking in 'slam'.	LC-0FC signal & screen	R	59

## LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<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 – Very Good	A clean and open sounding cable that offered a deep and pleasantly detailed perspective. Bass was slightly restricted, but seemed tight and coherent nonetheless.	15 silver strands, polyethylene dielectric		64
<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-0FC cables this PC-OCC derivative sounded smoother and less aggressive.	PC-OCC, PVC dielectric		64
<b>Bellwire</b> 12p per metre	Poor Average –	Broadly speaking it delivered a bright and tizzy sounding treble with a fairly open and detailed mid with little or no bass resolution.	0.5mm single strand, PVC dielectric		64
<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

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



# THE DIRECTORY

## LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
<b>DNM Solid core</b> £2.30 per metre	Average Fair	A good general-purpose solid-core, though too bandwidth limited for high-end applications. Sounds great in some systems	0.65mm single strand, webbed PVC dielectric	R	64
<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 unfatiguing treble with slightly rich but suitably weighty bass	OF copper, PTFE dielectric	R	64
<b>Linn K20</b> £2.20 per metre	Good Fair	Subjectively it erred on the forward and bright side of neutral but enjoyed an essentially clear and punchy delivery	56 OFC strands, webbed PVC dielectric		64
<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 unfatiguing 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> 90p per metre	Good Fair	For much of the last decade QED 79-Strand has been the first port of call for enthusiasts on the upgrading ladder, a tradition that should still hold true today	79 strand, PVC dielectric	R	64
<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, unfatiguing 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> 36p per metre	Fair+ Good	It enjoys much of the smooth treble and articulate midrange usually associated with the better solid core derivatives. Lean but taut and rhythmically coherent	1.5mm square, 3 cores, PVC dielectric	BB	64
<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
<b>van den Hul SCS-2</b> £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
<b>Vecteur R-CV30</b> £4.99 per metre	Fair Good	Subjectively the better of Vecteur's three-strong cable line-up offering a neutral overall perspective but with a slight loss of detail resolution at both frequency extremes	4 x 0.8mm LC-OFC PTFE insulated strands	BB	64
<b>Vecteur S-CV90</b> £1.99 – 5m pair	Fair+ Fair+	It seemed both less transparent and integrated throughout the midband than R-CV30, though both frequency extremes were spruced up with a tighter sharper delivery	6 x 0.7mm LC-OFC strands		64

To Advertise in  
this space ring Miriam Young  
on 01-631 1433

## THE DIRECTORY

## IN-CAR ENTERTAINMENT

In-car entertainment is an area not usually associated with the esoteric world of domestic hi-fi. However, it represents a source of musical entertainment that many of us are exposed to every day. The majority of new cars are fitted with some form of radio before they leave the showroom and in many cases this usually very basic player is taken for granted and accepted as representative of in-car audio standards.

For the price of a budget amplifier or more, there is a wide variety of in-car machines to choose from,

including cassette, CD and even DAT players. The majority of sub £300 players are integrated units featuring a cassette player, AM/FM tuner and amplifier, all in one remarkably compact standard sized box. At this price level the cassette players tend to be fairly basic affairs, although autoreverse and noise reduction systems are both fairly common. Tuners are usually of the digital variety with varying degrees of sophistication in signal tuning and presetting, with some machines featuring as many as 18 FM presets. The emphasis is on the frequency

modulated band and AM often suffers as a consequence, but fortunately for radio enthusiasts there are some exceptions.

The amplifier is usually designed to drive two pairs of speakers mounted fore and aft of the vehicle, and a fader is fitted to adjust the balance between the two. The dearer machines feature separate bass and treble controls which can be quite handy given the unusual acoustic of the car environment and the variety in balance and presentation to be had from car speakers.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Alpine 7282L £250	Good Very Good	A very attractive and seductive sounding player. The matt surfaced transparent preset keys are especially sexy	Bass/treble controls, 12 FM 6 AM presets, chrome eq., clock, 8W	R	61
Alpine 7905M/3539 £650/£350	Excellent Excellent	An easy to use and attractive CD/tuner, partnered with a powerful and flexible amplifier to give an effortless source of in-car entertainment	Bass/treble controls, 12 FM, 12 AM presets, slide-out, 150W	R	68
Blaupunkt Windsor SQR 38 £275	Good Average	Not very enthralling sonically, the Windsor is rather low powered but does have a reasonably stable tape transport	5 FM, 10 AM presets, 3.1W		62
Clarion 916HP £160	Good Average	With its rubbery buttons and touches of white this is a modest looking player let down by a weak cassette	Bass/treble controls, 5 FM, 5 AM presets, 9W		61
Clarion 946HP £250	Very Good Very Good	A good FM side let down slightly by AM performance. This Clarion is particularly nice to use with its nifty SAM tuning system	Bass/treble controls, 12 FM/6 AM presets, Slot-in, 15.1W	R	61
Clarion CDC7000/10028HA £650/£250	Very Good Excellent	Despite a slightly off-beat cartridge system the Clarion combo put in a performance that had the sonic edge over other CD/tuners in its test group	Bass/treble controls, 12 FM, 12 AM presets, security code, 80W	R	68
Goodmans GCE229 £150	Fair Average	If knobs, switches and legends are your bag then the GCE229 is the one for you - a lot of gizmos for the price and it even sounds OK	Bass/treble controls, 6 FM/6 AM presets, Chrome eq., clock, MSS, 10.1W	BB	61
Hitachi CSK-402E £250	Good Good	An attractively designed little player that for once doesn't disappoint when it comes to playing music, and it even has a security system	Bass/treble controls, 6 FM, 12 AM presets, Dolby, chrome eq., music search, 7.4W	R	62
Nakamichi TD-400E/PA-300 II £495/£329	Very Good Very Good	If you want your in-car entertainment to compete on sound quality grounds with your domestic system, this combo offers a very strong challenge	Bass/treble controls, 5 FM, 10 AM presets, uni-directional, chrome eq., Dolby B, C, 75W	R	62
Nakamichi TD-700E/PA-300II £874/£329	Very Good Excellent	For those who appreciate the wonders of analogue there are few in-car players to really compete with this superb cassette/radio. You can even adjust azimuth	Bass/treble controls, 6 FM, 6 AM presets, music search, Dolby, 75W	R	68
Panasonic CQ-497 £117	Fair Poor	The CQ-497 has a traditional style analogue tuning system making it easy to use. AM reception was good but the other sources are less encouraging	Bass/treble controls, chrome, NR, 7W		62
Philips DC680 £180	Average Good	A colourful and musically competent player that despite a gammy volume knob is well worth checking out.	8 FM, 4 AM presets 3.5W	R	61
Pioneer DEX-M300/CDX-M100/GM-300D £300/£450/£280	n/a Very Good	Separate control unit and boot mounted multi play autochanger make this a bit of a hefty installation but it uses the same magazines as their domestic players and sounds fine	Bass/treble controls, 18 FM, 6 AM presets, 80W, removable fascia		68
Proton 214CD/D275 £300/£175	Very Good Very Good	This Proton cassette/tuner offers goodpower and a level of fidelity appropriate to its price. Musically it has a Decca-like charm that is very appealing, plus a sensitive radio	Bass/treble controls, 8 FM, 8 AM presets, Dolby B/C NR, chrome eq., 85W	R	68
Sharp RG-F816E £200	Poor Average	Nothing if not novel the 816, with its unusual anti-theft system is custom built for the furry dice brigade, but is sonically a bit lacklustre	Four band graphic, 8 FM, 16 AM presets, ASP, Dolby, MSS, 10.9W		62
Sharp RG-F882E £220	Average Average	Again a glitzy full feature machine with a flip out control panel and plenty of lights. However, sound quality is a bit disappointing	Seven band graphic, 5 FM, 10 AM presets, ASP, chrome eq., Dolby, 8.5W		62

## RECEIVERS

Purists will look down their noses at the very idea of combining two functions into one box, and indeed they always have done. But unless we're talking about the exotic elite, the creme de la creme of amplifier and tunerdom, intrinsic technical shortcomings simply aren't an issue.

One obvious reason why you should buy a receiver if you were otherwise considering an amplifier and a tuner is that there are savings, ie of

size. Generally you end up with one box in place of two similarly sized boxes, which has got to be a good idea. Receivers are also simpler to operate, in principle anyway. At the very least you save on one power switch, and typically you are presented with an integrated control system that is bound to oil the wheels of ergonomics.

But there is one important point to watch. Because receivers don't sell in vast quantities in

this country, and because this is one of the very few countries to use Long Wave for public service broadcasting, many - no, most - receivers on sale in this country cover FM and MW only. Remember that LW is the home of Radio 4, where it can be heard on the all too frequent occasions it is not on FM.

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Harman Kardon HK330Vi £259	Average Average—	No LW, and FM section best suited to strong, local transmissions. The amplifier is quite powerful but favours the treble. Bass is tuneful but lacks weight	5 inputs (inc 2 tape), FM/MW tuner		70
Harman Kardon HK440Vxi £299	Good Good	Clear, dynamic, slightly bright sounding design, a little grainy in extremis. Mono switching and LW missing from tuner, which otherwise performs well	5 inputs (including 2 tape) with FM/MW tuner	R	70
JVC RX-777VL £500	Good Good	Sharp, lively but euphonious sound quality from line and phono source is matched to a high grade tuner. However, many half-baked facilities blunt value for money	A/V capable with 6 inputs, equaliser, digital ambience, FM, MW/LW		70
JVC RX-1001V £770	Average Poor	Power output is well below spec, and sound quality is cluttered and messy on all inputs	Digital ambience processing, Dolby Surround, 2/4 speaker, 40 FM/MW presets		70
Revox B285 £1782	Average Average—	Sophisticated and capable tuner is married to a muddled, compressed sounding amplifier, which also has low sensitivity preventing the amplifier being driven fully in many situations	70 watts/ch, 4 inputs (inc 2 tape), 29 FM/MW/LW presets		70
Rotel RX-850AL £230	Good Good	Well built and sensibly equipped receiver with outstanding sound quality for the price via the tuner, phono and line sources alike. It majors on subtlety however, and may not impress the heavy metal brigade	4 inputs (inc 1 tape), FM/MW/LW tuner	BB	70
SAE R102 £599	Average— Average	This is an uneven but mostly good performer. It sounds constrained but musical, but the tuner is weak on both wavebands.	4 inputs (inc 2 tape), FM/MW tuner		70

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 14

# THE DIRECTORY

## VIDEO RECORDERS

For some time there's been a move to improve both the video and the audio quality of video recorders and TV sets alike as a necessary prelude to a proper integration between the two. Hi-fi video is obviously an important element in the story, and so is Dolby Stereo, the ambient 'surround sound'

system. The weak link of course is on the broadcast side. Although TV sound is well up to normal hi-fi standards, it has always been in mono and unjustly or otherwise has rarely attracted much audiophile interest. But TV sound is – or shortly will be – freed of the shackles of mono by the introduction of NICAM

stereo. NICAM – an acronym for Near Instantaneous Companding and Modulating – is the missing link that will help facilitate the much feted integration of video with audio. And then we have S-VHS, a system which does for picture quality what the other developments promise to do for the sound . . .

NAME PRICE	LAB SOUND & PICTURE	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai VS-75EK £550	Average Good	Excellent performance and a slick set of controls make this recorder a pleasure to use. Good price is a bonus	Hi-fi, NICAM, programmable remote	BB	71
Akai VS-77EK £700	Average Good	Another fine and carefully designed model from the impressive Akai video stable. The Dolby installation, whilst flawed, is certain to increase interest in the system	Hi-fi, NICAM, Dolby Surround decoder & stereo amp	R	71
Ferguson FV33H £500	Very Good Below Average	Beer budget NICAM has excellent tape search facilities and an intelligent remote control. Neither picture nor sound quality however are state of the art, and ergonomics are poor	Hi-fi, NICAM, transmitter LCD remote control		71
JVC HR-D750EK £500	Good Average+	Well sorted and relatively affordable NICAM recorder with LP sound only. It is pleasing to use and helpfully equipped, especially when trying to find individual recordings buried in long tapes. Performance is good in relation to price	Hi-fi, NICAM, transmitter LCD remote control	BB	71
JVC HR-S5000EK £1000	Good Very Good	This is the first domestic S-VHS recorder on the market, and it's an unusually well designed one with a wide range of well sorted features and controls. Sound and picture quality are close to state of the art, and miles ahead of any non-S-VHS recorder	S-VHS, Hi-fi, NICAM, LCD remote	R	71
Mitsubishi HS-B70 £1000	Very Good Very Good+	Superb model, and true state of the art picture quality, though you'll need a high grade S-VHS compatible monitor to reap full advantage. The facilities are also wide ranging and generally helpful	S-VHS, Hi-fi, NICAM, LP & SP, programmable remote	R	71
Nordmende V4405K £799	Good Good	Fine basic sound and picture quality, but the RF convertor introduced significant losses. An excellent model, but configured for German home market. VPS compatibility is of no practical use here, and the recorder lacks NICAM	Hi-fi, transmitter handset, digital FX		71
Panasonic NV-FS1 £1000	Poor Good	The control system is poorly organised, with cramped legends and some strange machine logic. Bar code programming is hardly a great achievement either. Picture and sound quality are good, but not state of the art	S-VHS, Hi-fi, NICAM, bar code programming		71
Sanyo VHR-D4710E £900	Very Good Good	Fine colour and moderate detail make for a basically good video section to match a fine sound section. Some of the facilities are a little disappointing however and the deck looks expensive	Hi-fi, NICAM, infra-red headphone remote, digital FX		71

## COLOUR TELEVISIONS

The standalone television set is rapidly evolving into a key component in integrated home entertainment systems. NICAM digital stereo sound is now being broadcast for several hours a week from London and Yorkshire transmitters, so stereo CTVs are now becoming available equipped with NICAM decoding and with rather more attention paid to the built-in amplifier and speakers.

NICAM is also available on Hi-fi stereo

videorecorders (see above), and this is usually the more practical route for hi-fi system integration, as well as allowing favourite musical events to be saved on tape. To both watch and record with stereo sound will require NICAM on each of course, but the decision to update one or the other first will probably have as much to do with the age of the respective components than the convenience of the interconnections.

The ten CTVs tested so far are all luxury stereo models with 'fatter squarer' 59cms tubes of various kinds. Best suited to a viewing distance of about 7ft, these are one size up from the most popular 51cms size sets and take about 23 per cent of the top 30 per cent of the market. All have remote control, Fasttext (enhanced teletext), and many have on-screen graphics and flexible in/out socketry.

NAME PRICE	SOUND PICTURE	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ferguson 59K5Q £599	Average— Good	Attractive and compact design highlights unusual (and rather nice) matt finish Super Planar tube. Picture and ergonomics are pretty good but on-board audio is a bit of an afterthought, lacking sufficient welly for music programming; socketry adequate	59cm SP FST, NICAM, Fasttext, o/s graphics	R	76
Grundig ST-63-460TT £649	Average— Average+	Bulky set's shape resembles a square-rigged sail; screen tilts back slightly, so might suit floor mounting, though beware room reflections. Picture quality is good, if a touch bland, but ergonomics are fairly impenetrable – no on-screen graphics either. Halfway respectable sound quality is over-enriched by cabinet drone.	59cm FST, NICAM, Fasttext		76
Hitachi C25-P759 £699	Average— Average—	Visually very compact and neat, with excellent handset ergonomics and good on-screen graphics and features. Picture quality 'hyped' and compromised by 'peaked' luma response; on-board sound has muscle but not subtlety, and NICAM (SCART) output lacks muting.	59cm FST, NICAM, Fasttext, o/s graphics		76
ITT Nokia £629	Average+ Average—	Bulky square-rigged shape helps deliver a respectable standalone sound quality at a modest enough price. A versatile set with good handset but no on-screen graphics, the picture quality of our sample lacked fine detail resolution, lending a 'soft focus' effect	59cm FST, NICAM, Fasttext		76
JVC AVS250 £550	Average+ Average—	This compact and delightfully versatile non-NICAM set has respectable on-board stereo sound and lovely screen graphics, along with an infernal handset. Our sample suffered a tuner problem which marred a picture quality which was pretty good when monitoring baseband signals off tape.	59cm FST, Fasttext, o/s graphics		76
Mitsubishi CT-2553 STX £649	Average Good	Arguably the best all-rounder in the group, this compact monitor-style set suffers from exasperating ergonomics but the picture is detailed if a shade untidy, the sound lusty if crude. NICAM (SCART) output lacks muting, and colour rendition a shade individual	59cm FST, NICAM, Fasttext, o/s graphics	R	76
Panasonic Prism TK-24 W1 £699	Average+ Average—	Handsome but bulky set delivers serious standalone sound quality. Lovely ergonomics but off-air picture quality marred by tuner section noise on our sample (works fine as picture monitor). Good NICAM (SCART) output	59cm FST, NICAM, Fasttext, o/s graphics		76
Philips 5574 £599	Average Average+	Neat and compact for a front-speaker set, this competitively priced allrounder lacks on screen graphics and remote white level (contrast) but is otherwise well equipped, if a shade undistinguished and conservative	59cm FST, NICAM, Fasttext	R	76
Sanyo CBP2559 £579	Poor Good+	Lovely subtle and detailed picture quality totally justifies strong recommendation, though handset is obtuse (lacking white level) and on-board sound is dire. NICAM £50 update due early 1990	59cm FST, Fasttext, o/s graphics, picture-in-picture	R	76
Sony DZ2512U £699	Average+ Average	Beautifully styled around the unique Trinitron tube, the sound benefits substantially from the odd looking detachable loudspeakers. Nice ergonomics with good on-screen graphics, the otherwise detailed picture is a little 'hyped'	59cm Trinitron, NICAM, Fasttext, o/s graphics	R	76

# THE WORLD'S NO 1 GUIDE TO BUYING HI-FI



## PERSONAL MESSAGES

*Paul Messenger is drawn once more to the bighearted OBS loudspeakers to check out their recent modifications.*

Amongst the 40 or so loudspeakers which clogged up the household in the springtime of this year, it is probably true to say that SD Acoustics' *OBS* was my personal favourite overall, taking relative prices into account of course. The review in question appeared in June '89, but for readers who missed it, here's a brief resume.

It's an \$800 three-way floorstanding design which really does a remarkably good job of pretending to be a full size loudspeaker, both physically and sonically. As loudspeakers go it is also very pretty, though by being wider than it is deep, it flies in the face of modern fashion and makes no attempt to disguise itself.

The bottom half-and-a-bit is a conventional enough bass 'bin', reflex loaded by a generous rear port. The baffle continues on upwards at half width to mount the midrange and treble drivers, leaving the space behind the midrange cone unobstructed, this driver operating as a dipole. Angled tryptich type 'ears' and a top plate provide stiffening and good horizontal dispersion characteristics.

I'm not prepared to guess to what extent the dipole feature is responsible for the attractive character of the *OBS*, but provided you're prepared (and able) to stand them clear of walls and listen from at least two metres away, the results combine an open and largely well balanced sound with an unusually generous sense of scale, the latter due in no small part to the overall height of the design, I suspect.

Crossover networks are by nature hugely imperfect devices, so in most three-way systems the overlap between drivers extends over a couple of octaves at each crossover 'point'. Combine this with the wide vertical separation of the drivers here and a fair measure of variation is inevitable, especially in terms of stereo image as one moves up (or down) in seating position. This is not unpleasant *per se*, but it does mean that some spots are

'sweeter' than others, from the point of view of coherence and focus. Under my conditions results seem best with ears at or above the tweeter axis.

I had one or two gripes about the panel and spike fixing, both of which have apparently received attention, but my major misgiving was that the treble sounded (and measured) just a bit too hot and 'fierce', drawing a little too much attention to itself and distracting from the overall subtlety and transparency.

It's a flaw *OBS* shares with a great many speakers on the market. So many in fact that I start to wonder whether it's a matter of engineering, of coincidence or a deliberate attempt to 'hype' the sound and add a pseudoclarity that assists showroom dems and sales. Brands such as Hitachi and Sony employ a similar strategem to good effect in the TV market, which adds weight to the conspiracy theory, but then I digress . . .

Shortly after I had completed the review and discussed

findings with the eponymous Mr SD, he admitted to incorporating a minor crossover modification which was designed to combat the criticism, hastening perforce to dispatch appropriate components and wiring diagram. Perforce is not a word in current usage within the Messenger household, so it took nearly six months to get around to savaging the *OBS*' crossovers (a verb in no way metaphoric) in order to establish what current production is up to. The mod is quite significant, changing the tweeter feed completely and adjusting the upper end of the midrange output.

The good news is that the treble sting has been somewhat alleviated, but the bad news is that it has by no means been eliminated. The result is some improvement to be sure, but I would say barely goes halfway towards eliminating this little blemish. I had the measurement gear to hand while doing the changeover, and so was able to take some before'n'after data. The individual unit responses

show that the tweeter has been pulled down a dB or two especially at the low end of its range, while the upper end of the midband is slightly lifted.

The room averaged responses as usual provided the best correlation with the sound quality, at least as far as the balance is concerned. The output at all frequencies above 1kHz is down about 1.5dB, though it is down by most (c2.5dB) just before the bump, and least (c1dB) at 4.5kHz, which is top end of both the 'bump' and the midrange unit's contribution.

The net result is that the treble as a whole is slightly better balanced with respect to bass and mid, so the bump is somewhat less obvious in the overall scheme of things. But the bump itself is still there, and it is only marginally less exposed in relation to the rest of the treble.

Deadlines and the tardiness of our postal system (plus some 30 new pairs of loudspeakers cluttering every nook in this very well crannied house) prevent any further exploration this month, but I suspect I shall again be drawn back to the *OBS* speaker and its little bump in due course.

Although important, balance is by no means the only criterion for a good loudspeaker. There's still room to smooth the treble, but the positive qualities continue much as before, and the overall balance of compromises that constitute any loudspeaker design remain very well judged. Indeed, you only have to compare *OBS* with the older, larger *SDI* and new ribbon-based *SD* that first appeared at Penta to hear how its limitations can be overcome, albeit at a price. But amongst the sub-£1,000 loudspeakers I have tried, which includes a number of interesting alternatives, it remains very high up my personal shortlist, less for its precision than a big-heartedness which goes a long way towards making listening to music the very pleasurable experience that it ought to be.





**LISTEN TO REFERENCE – GOLD  
LOUDSPEAKERS ——— MA 1200/Gold  
MA 1800/Gold**

**LISTEN TO THE WORLD'S FIRST GOLD METAL DOME**

- \* 26mm Dome with vented voice coil assembly.
- \* F/Fluid cooled. \* Extremely High Power handling.
- \* Superb Diecast Bass/Mid Driver, using large aluminium v/c assembly.
- \* Vented Pole/Magnet. \* Unique cone/surround materials.

**Designed — Engineered  
Built . . . . .  
Like no other  
Loudspeaker  
in the world.**



**MA 1800/G  
SANTOS R/WOOD**



**MONITOR AUDIO LTD**

Unit 34, Clifton Road, Cambridge. CB1 4ZW  
Tel.: (0223) 242898/248344  
FAX: 0223-214532





MISSION  
ELECTRONICS

because people like music

MISSION-CYRUS GROUP HUNTINGDON PE 18 6ED ENGLAND PHONE (0480)52777 TELEX 32333 FAX (0480)432777

# HI-FI CHOICE

**Special Introductory Charter Subscription Offer!**

**SAVE 40%  
ON NEWS STAND PRICES!**

**NEWS STAND PRICE ~~£35.40~~**  
12 Issues UK

**SUBSCRIPTION  
PRICE – ONLY **£19.95!**** 12 Issues UK

Hi-Fi Choice is the world's number 1 guide to buying Hi-Fi. Packed with reviews, news and features in a brand new colour section, Hi-Fi Choice is the magazine if you are serious about Hi-Fi.

Take advantage of our special Charter Subscription Offer and Hi-Fi Choice can be yours for just **£19.95\*** a year (a saving of **£15.45** on news stand prices!) — including priority despatch to your home.

\*UK

Yes! I want to save over £15 by subscribing to Hi-Fi Choice, the world's number 1 guide to buying Hi-Fi.

Please start my subscription from the next available issue.

Please tick the appropriate boxes:

- UK £19.95  
 Europe/Eire £24.95  
 Rest Of The World £29.95

I enclose my cheque/Postal Order made payable to **Dennis Publishing Ltd\***

Please charge my **Access\*/Visa\*/American Express\*/Diners Club\***

account number \_\_\_\_\_

Expiry Date \_\_\_\_\_

Signed \_\_\_\_\_

\*Please delete as appropriate

## What you get

- 12 monthly issues of the world's finest hi-fi magazine
- Priority despatch to your door (this means that you will always get Hi-Fi Choice before it appears in the shops)
- Special reader offers
- Low cost renewals offers
- Full lab and listening tests on over 700 products.

**Hi-Fi Choice Subscription Hotline**  
For credit card orders and  
subscription enquiries  
Telephone 01-580 8908  
Fax 01-636 5668  
Telex 8954139 DENNIS G

Unless paying by credit card, all payments must be drawn in sterling on a UK bank. Using your credit card ensures that your subscription will start without delay!

Please send my copies of Hi-Fi Choice to-

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Postcode \_\_\_\_\_

Telephone \_\_\_\_\_

If you are paying by credit card, simply detach this card and pop it in the post. If paying by cheque or Postal Order, send this card with your payment to the FREEPOST address overleaf (UK Only) or to the Subscriptions Department, Hi-Fi Choice, 120-126, Lavender Avenue, Mitcham, Surrey CR4 3HP.

This information will be added to our mailing list. If you would prefer not to receive details of special offers and promotions, please let us know.

# HI-FI CHOICE

**SAVE! SAVE! SAVE!**

12 MONTHS

HI-FI CHOICE

FOR THE PRICE OF  
**SEVEN!**

*Subscribe Today  
and Save £15!*

**HI-FI CHOICE**  
Charter  
Subscription Offer

No stamp  
required  
if posted  
in the  
UK.

Subscriptions Department DPL/C,  
Hi-Fi Choice,  
**FREEPOST,**  
Mitcham,  
Surrey CR4 9AR.