

SPECIAL EDITION

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HI-FI CHOICE

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



the **Collection**

*Complete Reviews On Some Of
The Best Hi-Fi In The World*

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(July-Dec 1989-23,847)

Menu

Welcome to *Hi-Fi Choice's* 1990 edition of *The Collection*, our annual high-end extravaganza where we throw caution to the wind and revel in some of the best quality hi-fi components money can buy.

In previous years *The Collection* has been one of our monthly issues (in 1989 it was the July edition, issue No. 71), but this year we decided to make it an extra-special '13th issue' - a full-colour feast of exotic audio indulgence - separate from our monthly *Hi-Fi Choice* schedule. Brimful of reviews by *Choice's* regular contributors on a vast selection of state-of-the-art products from many of the world's top hi-fi designers, *The Collection* is all about the pursuit of excellence, the quest for the ultimate in sound reproduction.

To be honest, when listening to the kind of components featured here, rarely do we bother to ask how much they cost. In the high-end audio arena 'value for money' is difficult to quantify; as with high performance motor cars, if you demand the finest you expect to pay for it. And as discussed in our introductory feature, *The state of play* (page 6), we feel no need to apologise for the enormous pricetags on the components highlighted in this edition. The price of excellence has always been high.

I remember saying in last year's *Collection* that the worst aspect of producing this high-end edition is having to wave goodbye to the fabulous equipment when the suppliers call to take it away. This year the parting was no less a tortuous experience. How can I continue to enjoy my system at home without the Conrad-Johnson *Premier Seven-A* preamplifier? Who's going to give me the £9,000 necessary to buy one?

Oh well. . .

John Bamford

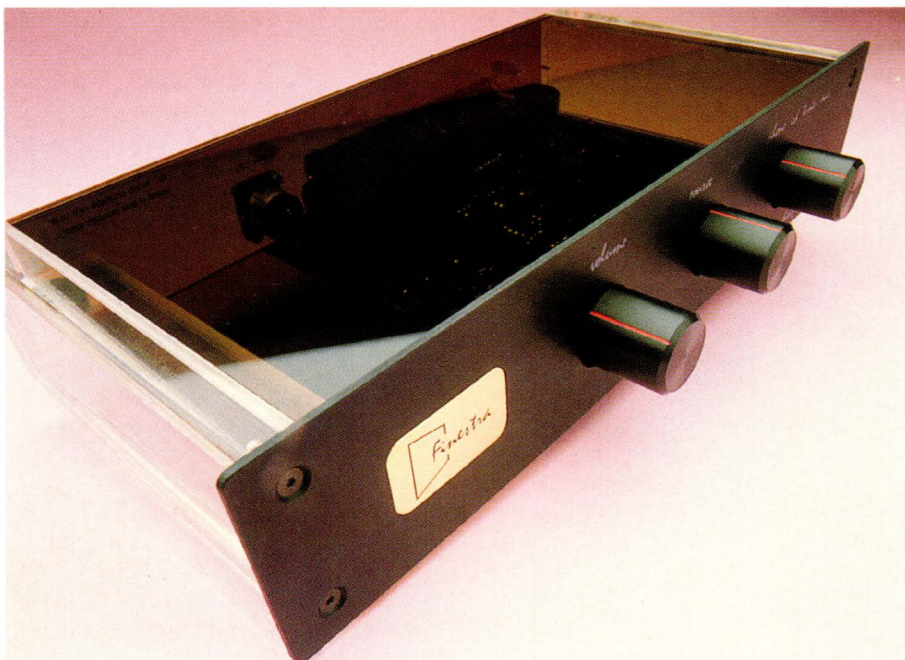


Photography by
Chris
Richardson.

Cover photograph shows the Michaelson Audio Chronos tube preamplifier, Teac P10/D10 CD transport and D-to-A converter, Oracle Delphi turntable and Carver Silver Seven power amplifier.

the Collection

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



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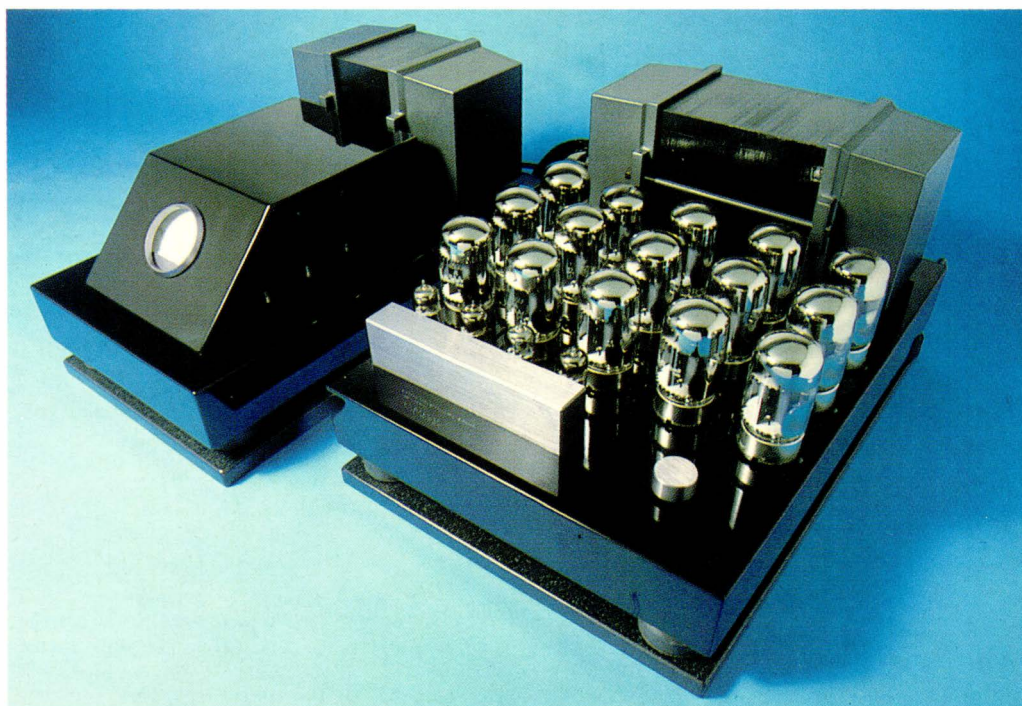
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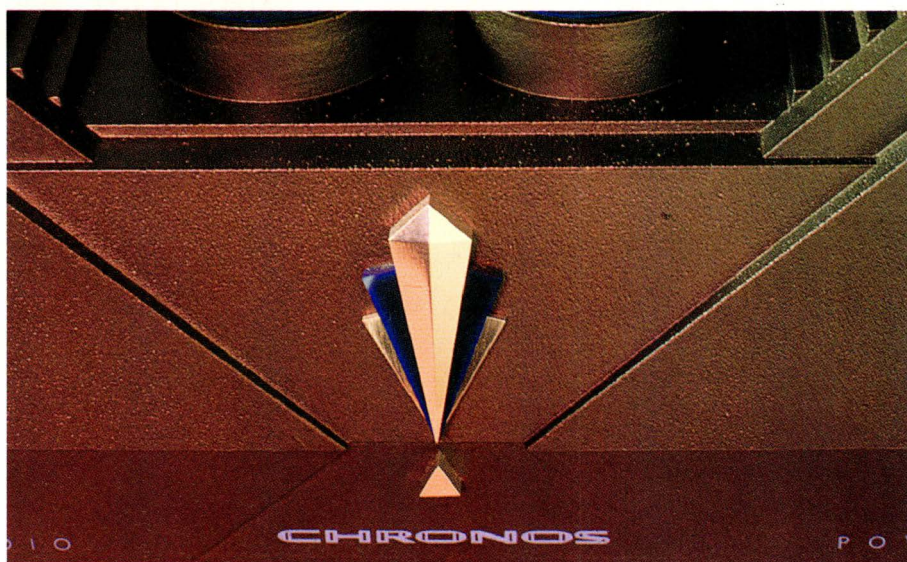
Top right: Krell Digital Inc's flagship three-box CD player. It's all yours for a cool £15,689. . .

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You've never seen valve amplifiers like this before! Michaelson Audio's £10,000 Chronos four-box combo makes a bold design statement, inside and out.



The Townshend Rock Reference turntable: the way to experience master tape sound quality from LP records.

147 Quantum cables reader offer

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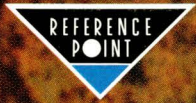
Next month, the January issue of *Choice* takes on two dozen new loudspeakers. We're also giving away a FREE blank tape supplement - plus there's a chance for you to win over £2,000 worth of Rotel hi-fi.

144 Audiophile recordings

Exactly how good is your hi-fi system? We've sourced a selection of the finest recordings from around the world - CDs and LPs - available to *Choice* readers by mail order.

Apogee designer Jason Bloom has at last delivered a full-range ribbon loudspeaker for (almost) every aspiring audiophile. The Apogee Stage is little bigger than a Quad electrostatic...





✓ WHAT HI-FI? AWARD WINNER.
A400.
BEST AMPLIFIER.



✓ WHAT HI-FI? AWARD WINNER.
A400.
BEST BUY OVERALL.



The state of play



Check back in the history books and you'll find that in 1920 a state of the art gramophone player cost £3,000. So is it any surprise that today's top quality hi-fi systems can set you back more than the cost of an average family motor car? John Bamford sets the scene for this year's Collection, as the Hi-Fi Choice review team get their hands on some of the finest audio components money can buy.

The trouble with high-end audio," said one astute observer, "is that there are too many products." In other words, you're spoiled for choice, but that's why *The Collection* exists. Our annual examination of the finest hi-fi products money can buy can help you to choose from among the hundreds of exotic products which aspire to state of the art.

Worse than frivolous?

That pundit's statement can mean a number of other things, not least being the fact that there are more products than there may be customers. We at *Hi-Fi Choice* continue to be amazed by the ever-increasing price tags, and can remember when a moving-coil cartridge costing £100 was considered something far worse than

merely frivolous. We now have a market where one can easily spend £4,000 on a cartridge, £75,000 on an amplifier or £80,000 on speakers. The pundit's remark, therefore, asks, "Who's buying this stuff?"

As with anything out of the ordinary, high-end hi-fi has to be put into perspective - and, no, this introduction isn't going to turn into a discourse on pay scales, the distribution of wealth or the social implications of owning a hi-fi which costs about the same as a decent family house in Esher. But neither do the reviewers in *The Collection* feel compelled to apologise for the high tariffs, as all of them understand that the price of excellence has always been high. And if you study what has gone before, you'll learn that - relative to the value of the

pound at any given time since Edison and Berliner unleashed their first music makers - high-end products today cost about the same. If you need an example, then you should know that the 'state of the art' gramophone at the end of the First World War cost £3,000 in 1920 pound notes.

That's not to say that *The Collection* is elitist; neither does it mean that only the extremely wealthy need apply. In this issue, you'll find a truly high-end dipole loudspeaker that costs just over £1,000 - or the same as a reasonable VCR-plus-TV set. You'll find that what may be the finest moving coil cartridge money can buy costs far less than half of what is asked for merely the dearest. A new phono amp which can lay claim to being the world's best is also reviewed in these pages, and it sells for about the same price as a garden-variety midsystem. So, despite seemingly frightening price tags, the rabid music lover can acquire stellar performers which *don't* cost as much as a new Audi.

Still, there are some who have been conditioned by television advertising campaigns which imply that the world is your oyster for £299. The tragedy is that such marketing has closed many minds to purist audio equipment, and there remains a core of consumers who rail against high-priced hardware. Of course, it's easy to point out that many people have a tendency to bad-mouth that which they are denied, but nowhere is this more prevalent than in hi-fi. One doesn't see letters in car magazines complaining about Ferrari, nor in photography magazines complaining about Leica. So, to appreciate the products which are written about in these pages, you have to accept them for what they are: attempts at making the reproduction of music in the home as realistic as possible.

Trend-spotting

As this is the first issue of *The Collection* in the 1990s, it's a perfect opportunity to note the trends and developments which will see us through the decade and into the next century. The products which we've gathered for this issue point the way to what the mid-market will be offering, as the trickle-down nature of



Left: loyalty to tubes remains strong. Above: exciting products continue to emerge from Oxford Acoustics.

new technology applies more strongly with digital technology than with any other. What's costly today should be affordable tomorrow.

Among the CD players reviewed in *The Collection* are two-box designs which illustrate the ascendancy of digital sources other than CD. Most, if not all of the outboard D/A processors on the market or planned for the near future offer a number of sampling rates and a variety of inputs - optical and coaxial - which will allow one D/A converter to accommodate a CD transport, a DAT 'front end', a NICAM tuner and whatever other new types of digital components may emerge. Once the dust settles, we'll see more clearly how 'multi-media' - the marriage of audio, video and home computers - will affect the layout of your hi-fi system. With Philips soon to launch CD-I, it won't be too long before you're using your hi-fi in conjunction with CDs for learning languages, studying encyclopedias, or planning travel routes.

It should be noted that no country is doing as much for high-quality, affordable digital products than Great Britain. Arcam and Musical Fidelity kicked off the concept of truly cost-effective standalone digital-to-analogue converters. Slightly dearer and just as innovative are the 'bitstream' D/A converters from Deltec and

Meridian, although the latter is represented in this issue by its bid for high-end supremacy.

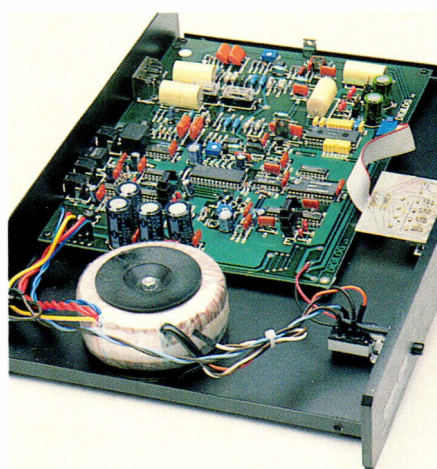
Also evident from our contents list is the continued, indeed *growing* strength of valve products in the high-end. It's doubtful that tube products will ever again have appeal beyond the enthusiast sector, even though companies like Croft and Audio Innovations produce quite affordable gear. The problem is that valve gear puts demands on the user which do

not affect switch-it-on-and-forget-it solid-state equipment. Adequate ventilation is required, speakers must be chosen with due caution about impedances, and valve degradation and eventual replacement must be considered. As such valve components are not for the faint of heart. But loyalty to tubes remains strong, as you'll see in the following reviews.

Analogue lives, okay!

Another seemingly vintage technology which refuses to rest in the museum is analogue, and we're pleased to include some fantastic products which demonstrate why many audiophiles still consider the LP to be the premier source. Oracle's gorgeous *Delphi*, one of the oldest survivors among the high-end turntables, has now reached *Mk IV* status, while Koetsu continues to produce a new standard-bearer every year. Roksan has finally released a standalone phono amp and it has a competitor in the Equinox. We've also gotten hold of the elusive *Voyd Reference* fitted with the *Helius Cyalene*. For those of you who want to read something with real bite, Barry Fox has interviewed analogue's most vociferous campaigner for *The Collection*, Linn Products' outspoken head honcho, Ivor Tiefenbrun.

Not yet ready for the shops at the time of going to print is Ortofon's *MC-5000*



Musical Fidelity Digilog: affordable outboard DACs began here.



SENNHEISER HD 480
**SOUND OUT THE GREY MATTER
BETWEEN THE EARS**

When What Hi-Fi? select products for their prestigious 'Awards' issue, they consider many factors. Comfort, design, sound, ease of repair - the list is long. It is therefore considered a great achievement to be considered as a contender for the much coveted 'Best of Category' award. There are hundreds of manufacturers world-wide, many of them producing Hi-Fi components of exceptional quality. But it is rare that one name constantly dominates a category year after year. Sennheiser is a name synonymous with quality German engineering. And it is a true mark of the outstanding quality of the Sennheiser HD480 that, not only has it been nominated for the 'Best Headphones' award, but has won it outright for the last three consecutive years.

To quote What Hi-Fi?, "...an achievement unparalleled in any other category." They go on to say, " - a high precision sound from a comfortable headset, as often found in professional recording studios as on hi-fi at home." "The warmth of orchestral strings glide through their accurately balanced transducers, and they're no shirkers when it comes to bopping either." "...these headphones are still able to outperform and outprice the rest. Sennheiser, even after an incredible third year, keeps its headphone crown." What more can we say, other than thank you.

*Sennheiser headphones are distributed in the UK by
Ram Projects Ltd., Unit 27 Stretford Motorway Estate,
Barton Dock Road, Stretford, Manchester M32 0ZH
Tel:061 866 8101*

 **SENNHEISER**

*Sennheiser U.K. Ltd., B2 Knaves Beech Business Centre,
Loudwater, High Wycombe, Buckinghamshire HP10 9QY*




· RAM · PROJECTS · L · T · D ·

cartridge, due for review in an upcoming issue. The hottest product in 1991, though, will probably be SME's long-awaited turntable, the *Series 30*. Doubtless we'll be reviewing that, too, in an upcoming issue of *Hi-Fi Choice* when the design is finalised. For the time being, we can tell you that this four-point-suspension, belt-drive design is said to achieve new levels of performance, leading many to believe that it may be the Last Great Turntable. Built to the company's enviably high standards, the *Series 30* also shows that a state of the art record player can be designed in such a way as to require only 20 minutes for setting up. Its price is a heady £9,000, but that's a long way from the most expensive turntable on the planet.

Cost-no-object

And the rest of the planet is where the really crazy stuff is available, as a number of cost-no-object designs have yet to find UK distributors. Japan is the source of a remarkable four-chassis preamp/power amp combination, the glorious Audio Devices noted for their retro styling. For £75,000, the company will sell you a preamp, phono amp and two monoblocks laden with gold and built to last.

Just announced by Swiss Physics is a 500W/channel stereo amplifier capable of delivering 2500 watts a side into 1ohm;



The Last Great Turntable? SME's £9,000 Series 30 looks to improve on the best...

it's hoped that the 12A and its lower-powered siblings will be made available in the UK in 1991.

Seen in prototype form at the recent Hi-Fi Penta Show is a stunning new deck to accompany the Morch tonearm from Denmark. Called the Tonic *Crystal Vision*, this deck uses copious amounts of solid granite. Price with an arm should be under £2,000.

Denmark is also the source for a new line of valve amplifiers under the Mantra banner, while Orange from Germany is about to release a tube amplifier which offers both a choice of valves for different power ratings and suspended innards to better isolate the amplifier.

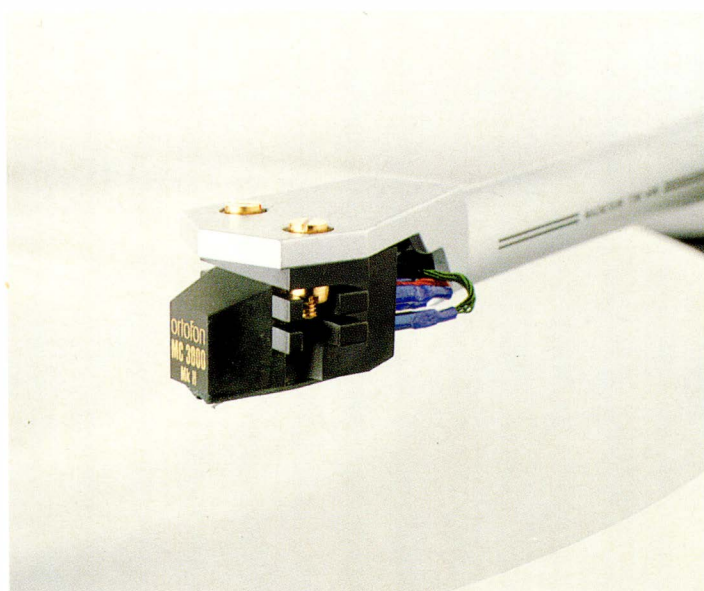
But the British remain the most prolific of tube amp manufacturers, and at all price points. Croft has unveiled a power

amplifier for under £500, while British Built Audiophile Products has updated the superb *BB100* with a better power supply. BBAP, by the way, is now distributed in the UK by Oxford Acoustics; the latter has been restructured with an injection of capital which should speed up the arrival of its iconoclastic products.

The tube underground

Other fresh tube designs Made In The UK include amps and preamps from Beard, Tube Technology, Sound Design Studio and Art Audio, while Lindley is about to launch what just may be the most expensive tube preamp on the market. As it's loaded with facilities which make it suitable for studio as well as hi-fi applications, it could find homes in the most unlikely places. Lindley has also undertaken what seems to be the most professional approach yet seen for the refurbishment of vintage tube products, including models from Leak, Radford and Quad. The company has decided to tap the tube underground by producing both purist restorations and modernising, depending on the customer.

New to this issue of *The Collection* is a practical feature which we hope will assist all of you in assessing the products in the shops. We've asked a number of reviewers to list the LPs and CDs they use for reviewing purposes, recordings chosen primarily for their sound quality rather than musical content. These can be regarded as tools as valuable as a spectrum analyser or AVO meter, and we've listed the qualities which they can be used to assess. No explanation has been offered, though, as to why Frank Zappa is the only artist with more than one entry on the list!

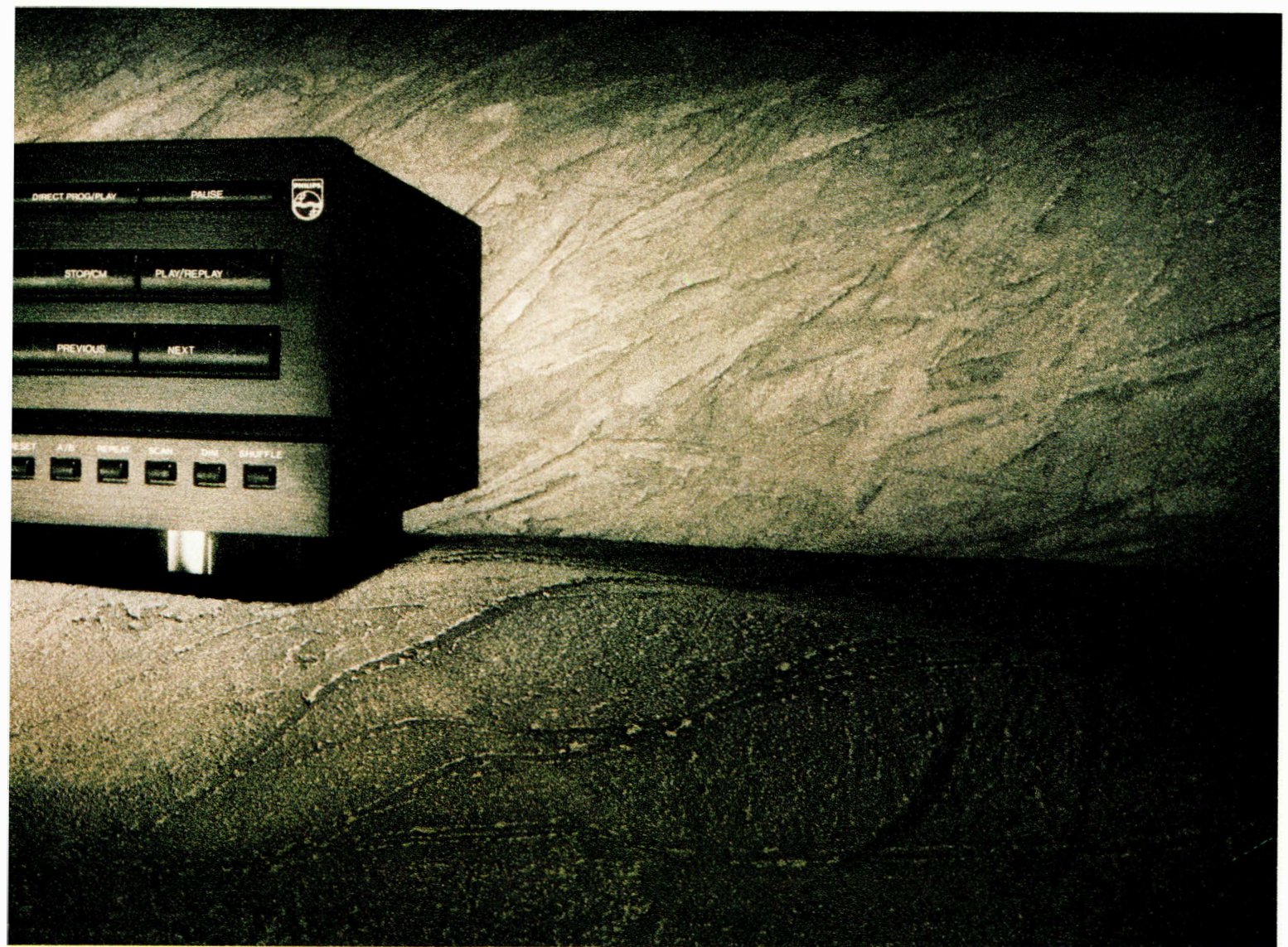


... And while top quality analogue reproduction marches on, Ortofon's flagship MC3000 cartridge is soon to be superseded by a new MC5000 model. (See Update for the latest news.)



**ON A PHILIPS BITS
PLAYER THE
SOUNDS 256 TIME
(OR WOR**

THE FUTURE IS PHILIPS



**TREAM CD
MUSIC
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SE).**

You are looking at the biggest breakthrough in CD technology since we invented it.

As everyone knows, in the old days (last week) CD players converted digital codes into analogue waves using 16-Bit digital to analogue microchips.

Of course you knew.

But a few old hi-fi buffs would always tell you it didn't sound 'quite' right.

Now, the Philips Bitstream's DAC uses one on/off 'switch' – true digital operation for the first time. Each of the 45,100 bits of information on the disc is over-sampled 256 times a second, creating a single stream of bits running at 11.2 million hertz.

Which is very fast.

All this produces a smoother sound wave and hence a more accurate conversion to analogue, with fewer glitches and noise. (In fact, an improvement of 4dB in signal to noise ratio.)

The sound of music will now have all the warmth and depth of the original recording; that should have a few people running for the hills.

For further information ring 0800 234 800.

High-end update . . .

Made to measure

You've got your 'designer label' clothes and toiletries; now you can adorn your hi-fi system with a similar amplifier combination, thanks to a new British manufacturer, Shearne Audio. The *John Shearne Phase One* pre and power amplifiers are designed to look a bit less starkly functional than most high-end equipment you see, without going to extremes of styling.

According to Shearne Audio boss John Shearne (who else?), the design brief was to produce amplifiers of good sonic properties, with fuss-free operation, which could tastefully fit in with Nineties decor. To this end, the front panels are finished in an unusual 'marbled' effect in black and dark blue, with legending in grey and nickel plated knobs.

The amplifiers' circuitry is said to use transistors in configurations reminiscent of valve circuits, with a minimum of feedback, to give a smooth, detailed and relaxing sound. The preamplifier has the usual inputs, including two full tape monitor circuits and switchable MM/MC cartridge compatibility, while the power amp is a full dual mono design with a rated output of 70W per channel.

Expected retail price for the *Phase One* pre/power combination is around £1,695, and it should be in the shops by Christmas.



Designer hi-fi for the contemporary home: John Shearne's Phase One combination.

Shearne Audio, PO Box 22, Stevenage, Herts SG2 8HF. Tel: (0438) 740953.

Pro Logic from Audiosource

American manufacturer Audiosource has unveiled a stand-alone surround-sound processor featuring Dolby Pro Logic. The *SS-Three* will process Dolby-encoded videos and CDs and features special effect modes including Matrix and Hall for non-encoded stereo recordings.

Digital delay, a mandatory specification for Dolby's rear-channel information, is switchable, and the *SS-Three* includes an auto-sequential

test tone, auto balance and auto calibration for left and right input signals to ensure correct set-up. The controls are duplicated on the handheld remote, along with rear volume, centre volume and master volume to allow for level setting from the main listening position.

The *SS-Three* features an onboard 30W rear-channel amplifier with line-out for centre and subwoofer channels, as well as an additional line-out for users who wish to employ higher-powered rear channel amplification. The subwoofer crossover is switchable for 80Hz or 150Hz and the subwoofer level is variable to accommodate a variety of

amplifiers. Price in the USA is a ludicrously low \$399. Audiosource, 1327 North Carolan Avenue, Burlingame, California 94010, USA. Tel: (0101) (415) 348 8114. Fax: (0101) (415) 348 8083.

DAT from Denon

With Digital Audio Tape now 'kosher', Denon has introduced a domestic DAT recorder, priced similarly to high-end analogue cassette decks rather than pursue the 'budget' approach. The *DTR 2000* retails for £799.95 and is a full-sized component.

Styling is clean, with all secondary buttons hidden beneath a drop-down flap, leaving only the basic controls on view; a comprehensive remote control is supplied with the unit. The *DTR 2000* employs a new Sigma/Delta A-to-D converter and 'phase correct' filters in the input section, with Denon's 'LAMBDA' 20-bit DACs in the output stages. A precision transport, diecast alloy base, damped and floating chassis and vibration-resistant casing complete the design. Hayden Laboratories Ltd, Chiltern Hill, Chalfont St Peter, Bucks SL9 9UG. Tel: (0753) 888447.



All yours for the price of an upmarket cassette deck: Denon's DTR 2000 DAT recorder.

Cheers for Basis

Basis, the American manufacturer of top-end turntables, has announced the launch of the *Ovation*, a 'half-price' alternative to the *Debut Gold Standard* model reviewed in this issue.

Like the original Basis, the *Ovation* features a fluid-damped, four-point suspension, a 2 inch thick acrylic subchassis, a matched platter/bearing assembly and a massive acrylic platter and armboard damped with lead. It uses a Swiss-made AC motor and offers both 33 and 45rpm. Total weight of the *Ovation* is 75lb.

As we go to press, it looks like Basis is about to appoint a UK distributor: Reference Imports, Pineridge, Sandy Cross, Heathfield, East Sussex TN21 8BS. Tel: (04352) 4481.

JBL scales the heights

In keeping with a tradition of naming high-end speakers



Your last Sony: the 100W Class A TAN R1 monoblok amplifier.

after tall peaks, JBL has launched the *Project K-2* as its new flagship.

Each column houses two 14 inch woofers, sandwiching a horn-loaded tweeter. The horn is hand-machined from solid Perspex and nestles between the woofer enclosures, with all contact between the modules made by spikes. Each assembly rests on a massive concrete

plinth requiring a pair of strong helpers to get them out of the packing crates. The modules are connected via gold-plated busbars and the arrangement allows for bi-wiring or bi-amping; alternatively, the user can purchase the *K2* without the upper woofer sections.

A variety of finishes will be made available; the first pairs arriving in the UK are finished in gloss black with grey grilles. Price of the *K2* is £19,000 plus VAT - which sounds less daunting than £21,850! Harman Audio (UK) Ltd, Mill Street, Slough, Berks SL2 5DD. Tel: (0753) 76911.

My last Sony

The company that markets portable plastic kiddies' ghetto blasters cleverly advertised as 'My First Sony' is introducing components which promise state of the art performance in its top-of-the-range *R Series*.

Sony has already been featured in Debrett's *Peerage* for its no-compromise headphones - the £2,500 *MDR-R10* (reviewed in last year's *Collection*). After a typically long silence denoting patient R&D work it has now launched some monoblok power amplifiers called *TAN R1*, costing a cool £8,000 a pair. Weighing in at a hefty 52kg each, the amps are finished in champagne gold to match the rest of the range and a version tailored specifically to the British

audiophile's taste has been launched here.

The 100watt Class A *TAN R1* features an open grille on the top plate; it doesn't use cooling fans which might be heard during quiet pieces of music and which Sony considers would produce internal interference. Nevertheless it runs fairly cool and there is a natty temperature gauge on the fascia allowing you to monitor its performance. The gold plated binding posts at the back are of industrial size compared to most amplifiers and will cater for any size of cable and connector currently on the market. Other features of these fabulous monobloks include a balanced input with both normal and anti-phase switching.

Sony also has a new two-box CD player: *CDP R1A* transport and *DAS R1A* decoder. This is a total reconfiguration of the *CDP R1* and *DAS R1* (also reviewed in last year's *Collection*) and now uses a 1-bit conversion system, has a redesigned transport mechanism, optical block and analogue filter. Price? A cool £5,000... which at least is in keeping with the rest of the range.

Stay tuned for news of Sony's complete *R Series* system; a £3,000 preamplifier should be coming up in the spring and Sony is hard at work perfecting its *Reference Monitor Speaker* - a five-way box due to hit the High Street in the summer of 1991.

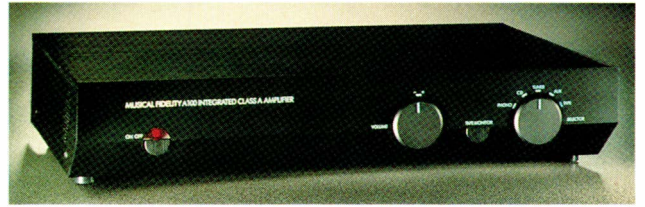


Scaling new heights: JBL's £22,000 Project K2s.

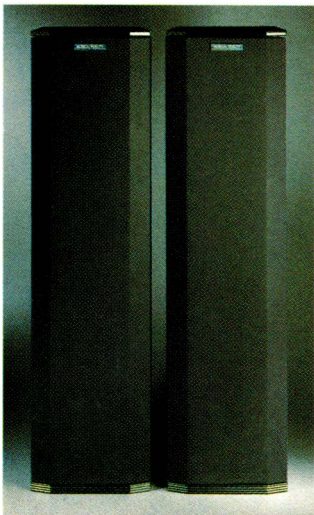
**OUR HI-FI DRIVES
THE CRITICS WILD.
WHAT WILL IT
DO TO YOU?**



Imagine you are a critic and spend all day listening to hi-fi for a living. Sounds okay until you realise how much mediocre hi-fi you have to endure. Boring isn't in it. But wake up, one British company makes hi-fi that isn't like the rest. The company is Musical Fidelity. We're different because we design hi-fi for people who want to enjoy recorded music delivered through the cleanest, most elegant signal path possible. We spare you the dross such as flashing lights and fiddly gizmos that only clutter the signal path. Our low feed-



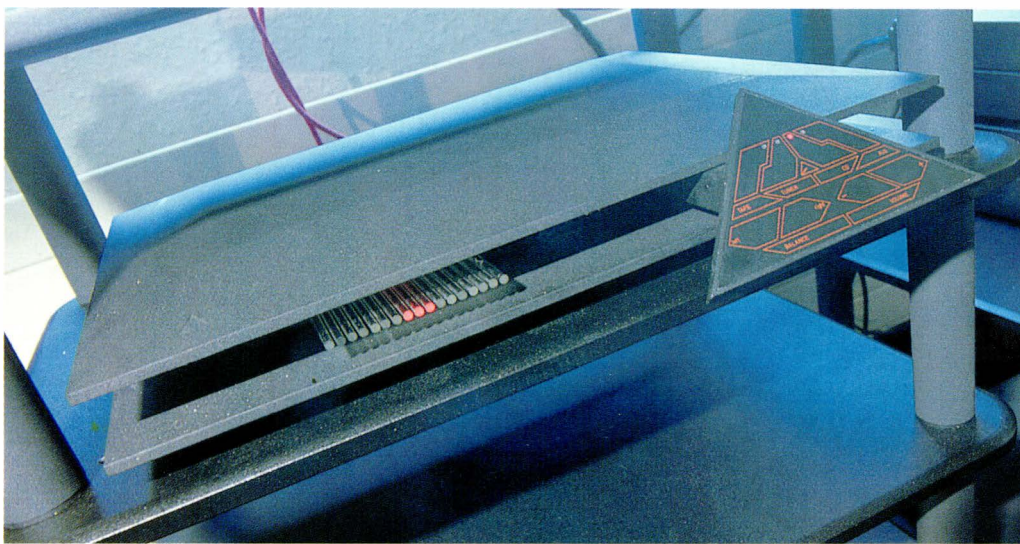
back amplifier circuits sound open and natural, for the most realistic sound possible. They can deliver astonishing dynamic range. And create an aural image that lets you pinpoint every voice or instru-



ment. The results can be stimulating, to say the least. "From this tiny inferno issues 50 watts of the nearest thing to magic" is what Audiophile with Hi-Fi Answers say about our A100 integrated amplifier. And in Hi-Fi News & Record Review, a critic writes that our huge 250 watts per channel SA470 super power amplifier is "probably the best amplifier ever produced in the UK." In fact, we make a wide range of hi-fi separates and loudspeakers that deliver maximum performance. To hear hi-fi that could send you wild, visit a Musical Fidelity stockist. Where you'll soon discover why *hearing is believing.*



MUSICAL FIDELITY



Not to be confused with Pink Triangle, the Triangle A01 integrated amp is radically styled.

Ortofon's MC flagship

Soaring yet higher in its continuing quest to become the world's Number One cartridge manufacturer from every point of view, Ortofon has introduced the MC5000 cartridge. While the MC3000, currently in *Mark II* guise, has been very well received in HFC and elsewhere, Ortofon's designers have seen an opportunity to take the design yet further by changing the cantilever from a tapered aluminium tube to solid sapphire of 0.2mm diameter. To accommodate this change, the cantilever suspension has been slightly altered too.

Within the cartridge, the coils are now wound with 'seven nines' copper, the purest grade available, which should provide for optimum current flow without impurities to rectify the signal. Ortofon even supplies a set of headshell leads made of the same material.

The MC5000's body remains the same as that of the MC3000/II, made of industrial sapphire. Apparently, Ortofon tried to bake the body one stage harder to make it translucent, but this was unfortunately not practical. Sonically, the MC5000 is said to major on the '3000's strengths but with even greater clarity and a fuller body to the sound. We wait with bated breath; at the time of writing, a review sample is expected daily.

Priced at a cool £1,500, the cartridge may not find a wide market, but the first MC5000s to come into this country have all been pre-sold.

Integrating style and sound

Mentioned in dispatches from Paris hi-fi shows but never seen here, Triangle products at last are being imported in the UK. Not to be confused with the British manufacturer Pink Triangle, the French Triangle company specialises in loudspeakers costing anything from £265 up to £4,000.

It was the Triangle amplifier, however, which caught our eye at the Zeus Audio hi-fi show in Belfast, Northern Ireland, recently. The £1,090 integrated A01 amplifier departs radically from the oblong black box norm of hi-fi separates. Two aluminium plates give it the look of a mini pagoda. The natty touch controls are all located in a small triangular plate mounted on the fascia. Just touching the volume 'up' or 'down' arrows sets the required listening level, while a completely aspirational cylindrical remote control allows volume control from across the room.

Both volume and stereo channel levels are shown through a row of LEDs shining down lengths of Perspex 'dowelling' which stand proud on the fascia.

The sound quality - heard with Meridian CD player and loudspeakers - suggests that this amplifier won't just be selling on its stunning looks alone.

Zeus is importing both the amplifier and a selection of Triangle loudspeakers. For more details, contact Zeus direct at: Zeus Audio, 6 Hope Street, Belfast, Northern Ireland. Tel: (0232) 332522.

The return of Dahlquist

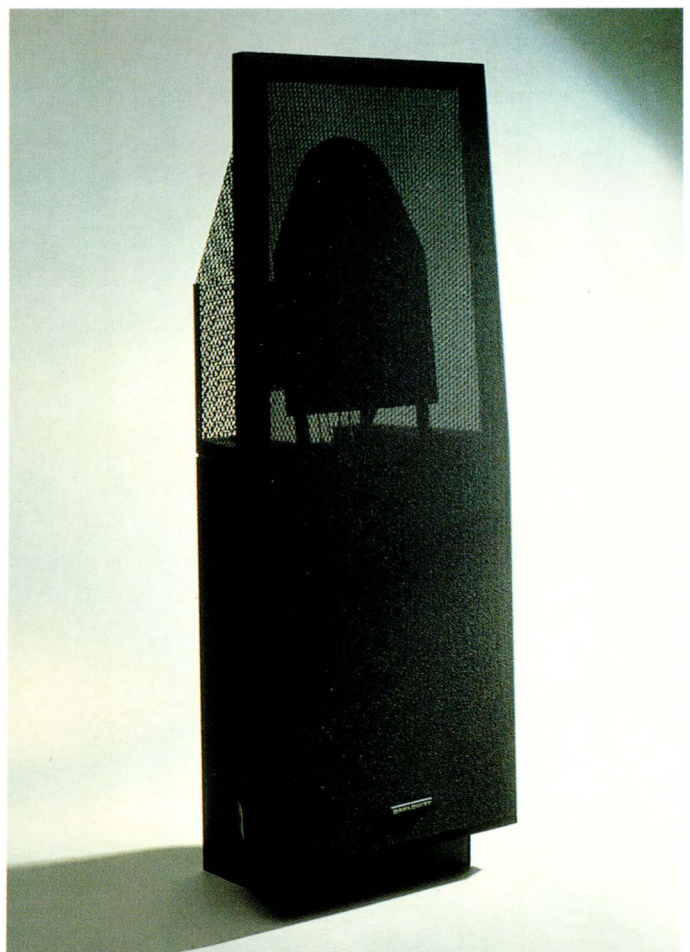
American-made Dahlquist loudspeakers have reappeared on these shores after a fairly lengthy absence. These unusual looking dynamic speakers use a technique called 'phased array' which seems to involve mounting the drivers in an arc and arranging the mid and high frequency units as a

dipole, finally wrapping the whole lot in an oversize grille cloth. The latter feature gives it its electrostatic-like appearance, a factor that caused some confusion when it appeared over here in the Seventies.

There are three floorstanding speakers in the range, starting with the £850 DQ8 and culminating in the £2,250 DQ20i flagship via the £1,300 DQ12 (pictured). The importer/distributor is a company called The Sound Image Stage, based at 458 Alexandra Avenue, Rayners Lane, Middlesex HA2 9TL. Tel: (081) 866 2865.

Rare needles

High-end distributor Path Premier is importing the Lyra range of Japanese cartridges. The first model to reach the UK is the £980 *Clavis* but there is one more expensive and two cheaper cartridges in the range. Scantec, the



'Arc-driven'? The Dahlquist DQ12 loudspeaker is dynamic, American - but not an electrostatic.

company that designs and builds Lyra pickups started out in the field by making the Tsurugi cartridge and went on to make parts for Koetsu and build other designs like the Jeff Rowland *Complement*, Spectral *MCR* and Audioquest *AQ 7000*. Having produced these highly acclaimed cartridges it was inevitable that Scantec would end up marketing its own range.

The *Clavis* is a low compliance moving coil design that has adequate output for most MM inputs. Its cantilever is made from a proprietary aluminium/ceramic alloy called Ceralloy, while the stylus is an ultra low mass Ogura PA line contact type. The *Clavis* has a milled alloy body which is drilled out to reduce weight and allow air cooling of the coils. Audio masochists can remove the body completely.

For further information contact Nigel Crump at Path Premier. Tel: (0494) 441736.



Danish company Dali's Skyline loudspeaker.

Danes in GB

Dali, the Danish loudspeaker manufacturer which appeared at the Heathrow Penta hi-fi show in September with an amplifier sporting an ignition key, has announced the appointment of a UK distributor. The company's products will be handled by C.S.E., of North Yorkshire.

In addition to a range of ribbon loudspeakers, Dali is offering the *Dali 700* (to be reviewed in our January 1991 issue of *Choice*) which

features a leaf super tweeter covering the region from 8kHz to 30kHz. This is coupled to a 2 inch paper-coned tweeter; the combination produces a high sensitivity design with greater headroom than a 1 inch dome-type driver. Price is £600 per pair.

Seen in prototype form at the Hi-Fi Show but due soon is the *Skyline*, a tall, tapering three-way full-range dipole using a 15 inch long-throw woofer. Two midrange drivers cover the range between 150Hz and 2kHz; above that frequency a 40 inch long Dali-designed transformerless ribbon takes over. Price will be £1,200. C.S.E., 5 Lucas Grove, North Tockwick, North Yorkshire YO5 8QZ. Tel: (0423) 358074.

Goldmund Gold Limited Edition

Goldmund is now shipping the Goldmund *Goldcube Limited Edition* 100W monoblok power amplifier. Believed to be the most expensive mono amplifier ever released, the *Goldcube* measures only 5 x 5 x 5 inches and is plated with a 10 micron layer of 24Kt gold, applied by 'the best Swiss jewellers'.

The 100W rating is into 8ohms, while bandwidth is said to be 1MHz. Each *Goldcube* features four separate internal power supplies. Manufacturing takes five months and is initiated only upon receipt of the customer's order. As the price of the *Goldcube* is indexed to the price of gold on the international market, potential customers should apply to their local Goldmund dealer for a quote. After 300 pairs of these monobloks have been made, all tools used for producing the *Goldcube* will be destroyed, to maintain collector value! Customers in the UK should apply to Absolute Sounds on (081) 947 5047, or send round their manuscripts to fetch a brochure.

Goldmund has also announced the creation of a new company called Meta



The Celestion SL700SE: the re-design makes it suitable for more amplifiers.

Research, to debut with two products. The *Laser1* CD Transport and *Convert 1* D/A converter employ digital electronics from another Goldmund division, Stellavox. The *Laser1* is a top-loading transport using mechanical grounding for 'vibrational evacuation' and a CD clamp based on the technology of the Goldmund *Record Clamp*. It can be connected via coaxial interconnect or optical fibre to the *Convert 1*. The latter employs the same converter technology as the Goldmund *Mimesis 10* D/A converter and the *Stelladat* professional DAT recorder.

Update to Celestion's SL700

Further to its unveiling at the Hi-Fi Show at Heathrow's Penta hotel, Celestion is now shipping the *SL700 Special Edition*. This latest version retains the dedicated stand

and Aerolam enclosure, 1 inch single-piece aluminium dome tweeter and 6.5 inch Cobex mid/bass driver. The updates include the lengthening of the woofer's voice coil and the inclusion of a new suspension to increase the driver's throw. The improvements resulting from these changes include greater power handling capability and better resolution at higher levels. The bass frequency has been rebalanced for greater smoothness and extension.

The *SL700 SE* also features a realigned crossover for more consistent sensitivity across the bandwidth, flatter response and greater top-end extension. A by-product of the redesign is suitability with a wider range of amplifiers. The *SL700 SE* sells for £1,399 including stands. Celestion International Ltd., Ditton Works, Foxhall Road, Ipswich IP3 8JP. Tel: (0473) 723131.

DALI of Denmark

Not just another speaker company

In December of 1980 DALI began OEM production of loudspeakers for a major American manufacturer. Production was contracted to an existing Danish factory until October of 1981 when we rented factory space and took complete charge of the manufacturing process.

In October of 1983 a furniture factory (3,000 square meters) was purchased to increase OEM capacity and to begin production of our own line of original DALI loudspeakers.

In August of 1986 DALI began construction of a 3,740 square meter loudspeaker factory. By the time the factory was completed in May of 1987, the DALI brand had established itself as a market presence and an expansion to 7,340 square meters was begun. The DALI factory now includes a research and development division with technical and laboratory facilities second to none.

DALI loudspeakers are currently sold in Australia, Denmark, Finland, Hong Kong, Japan, Korea, Norway, Singapore, Spain, Sweden, Taiwan, Thailand, Turkey and the USA.

Coming attractions

During the next few months DALI will launch several new models.

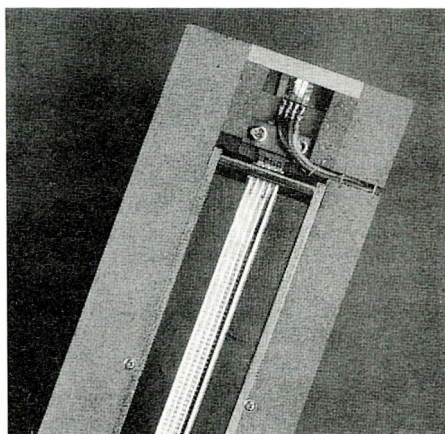
The DALI 102, 104, 300 and 400 are two-way designs with 6" bass/midrange drivers custom-designed for each model. The cloth dome tweeters employed in the series are also unique to each model.

The DALI 700 and 800 are three-way systems incorporating a ribbon super-tweeter, a 2" cone tweeter with a low-mass motor assembly, a 5" midrange driver with a lightweight voice coil and a long-throw 8" bass driver. The DALI 800 employs an additional 6 1/2" woofer for enhanced deep-bass and transient performance.

The DALI ribbon driver

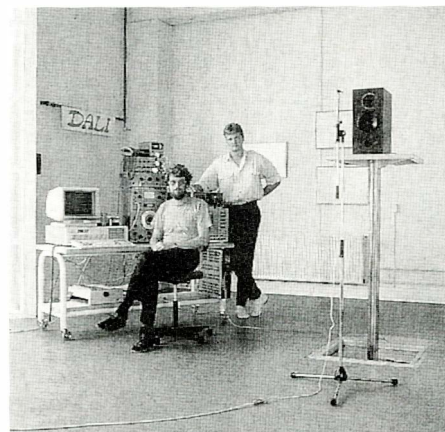
The ribbon element introduced in the DALI DaCapo hybrid loudspeaker is the first result of DALI's major commitment to ambitious research programmes in the field of ribbon and electrostatic driver configurations.

The DALI ribbon is a 3/4" wide, 40" long treble/midrange driver with a surface area comparable to 50 conventional tweeters. The ribbon itself weighs 0.7



gram and is 36 micrometers thin. The 4 ohm system employs three separate current paths to increase the ribbon impedance, to provide more "wire" in the magnetic gap and to generate a more linear magnetic field.

The complete ribbon assembly weighs 16 kg and contributes significantly to overall system stability and rigidity.



Research and development

The skilled engineers of the DALI research and development team have assembled an impressive array of state-of-the-art tools to assist in their work. Measurements of frequency response, impedance, impulse response, group delay, spectral decay, distortion and time energy ensure a comprehensive understanding of all performance aspects.

The DALI laboratory includes the most advanced test equipment for Time Delay Spectrometry, two-channel FFT,

modal analysis and intensity measurements.

Custom CAD/CAM programmes take the drudgery out of time-consuming calculations and help to optimize every aspect of the performance of DALI products.

DALI loudspeakers incorporate our proprietary Linear Directivity principles with controlled dispersion characteristics and fine measurable performance up to 70 degrees off-axis.

DALI loudspeakers' Linear Impedance Load is fine-tuned for the smallest possible electrical phase angle in order to present the amplifier with an easy load.

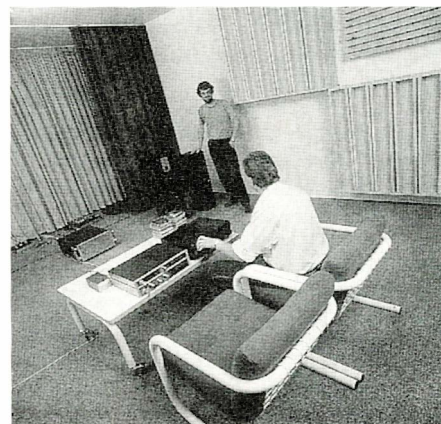
The structural integrity and firm internal bracing of all DALI cabinets are the result of comprehensive modal analysis which reveals potential vibration problems at an early stage.

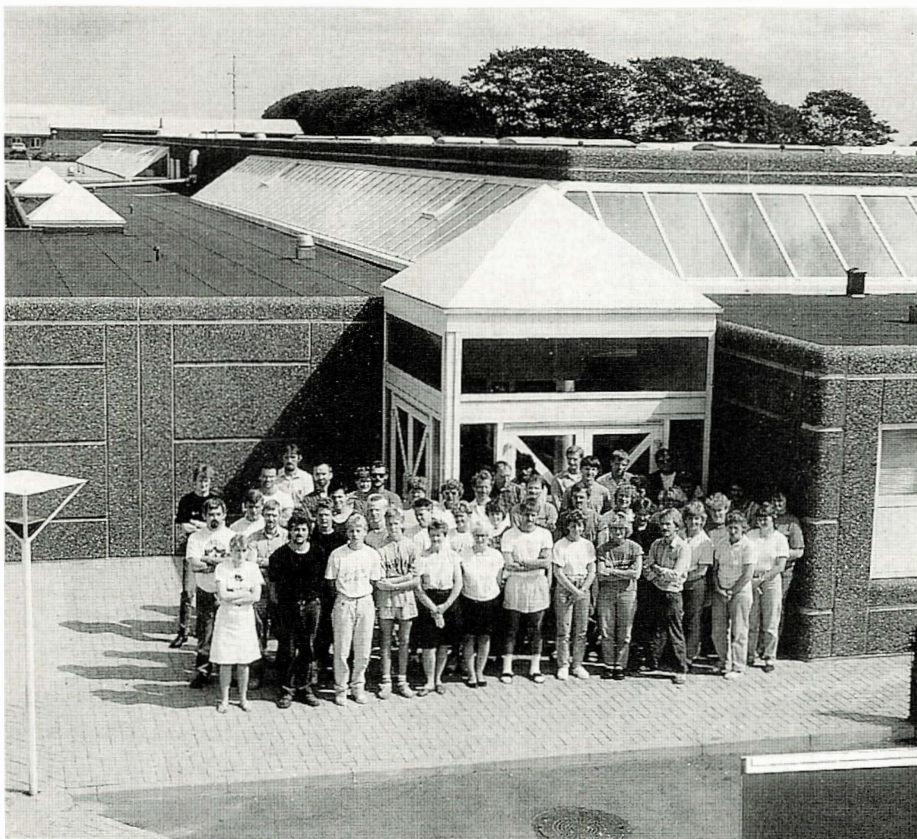
IEC listening room

Where technology leaves off, the human ear takes over. DALI employs a skilled panel of experienced listeners to ensure the realism and musicality of every product.

Because the performance of an audio product in the laboratory or in a perfect listening room bears little resemblance to its behaviour in a real-world living space, the DALI R&D department have at their disposal a listening room constructed to the strictest standards of the International Electrotechnical Commission (IEC 268-13).

This statistically "typical" room ensures that what we hear at our factory in Jutland, Denmark will be the same thing DALI owners will hear in homes all over the world.





amplifier conservatively rated at 2 x 120 Watts pure Class A.

Uncompromising perfectionism in design, component selection, workmanship and musicality make the DALI system a landmark event in the field of audio.



Grynderupvejen 12
DK-9610 Nørager
Denmark
Phone +45 98 55 17 00
Fax +45 98 55 17 11

With an eye on the future

DALI's commitment to staying well in front of the pack entails major investments in new research and development technology and advanced manufacturing techniques.

Work has already begun on a large anechoic chamber with an 80Hz lower frequency limit, in which measurements can be made with a reliability unavailable to the vast majority of loudspeaker designers.

A further 3,000 square meter expansion of the DALI factory will bring the last remaining phase of production in-house. Full cabinet manufacturing and assembly facilities will give DALI total flexibility and full control of every aspect of loudspeaker design and production.

Mastery of the entire development and production process allows stricter quality control, ensuring durability and outstanding levels of unit-to-unit consistency and musical performance.

Not just another speaker company

The first DALI foray into the field of consumer electronics is the highly successful DALI Phono Preamplifier which introduces analogue playback capability to the fast-growing number of line-

level only, so-called "digital" preamplifiers and integrated amplifiers. It will also upgrade the RIAA circuitry in any system.

Presented for the first time at the Penta Show in September, DALI's ultimate preamp/power amp combination turned heads and dropped jaws. The system consists of the DALI Detal line preamplifier, separate DALI Expan MM/MC phono stage and the DALI Gravity power





Building a library

The Hi-Fi Choice team delves into its respective music collections, and comes up with an anthology of the best audiophile recordings around.

Publishing a list of recommended recordings presupposes that the compiler's tastes should be imposed upon the reader. For *The Collection*, we've opted not for a list of 'great music', because one man's (or woman's) Sinatra is another's Jason Donovan. Far safer and far more useful, then, is a list of recommended recordings which were chosen unashamedly for their sonic worth. Indeed, one contributor stated that he actually hates most of the music with which he assesses hardware, but this enables him to concentrate on the sound and not be distracted by the entertainment value of the recording.

As it turns out, the contributors happened to

choose sonic spectaculars which aren't musical wastelands. But that's icing on the cake. The recordings listed below were selected solely for their capacity to help you assess components; if you also happen to adore the music, so much the better.

Code:

AG = Alvin Gold
CB = Chris Bryant
DH = Dan Houston
JB = John Bamford
JK = Jason Kennedy
KK = Ken Kessler
PM = Paul Miller

Classical:

Beethoven: Piano Sonata No 8 Op 13, No 20 Op 49, No 2, No 5 Op 10, No 2, No 3 Op 2, No 3 - Bruno-Leonardo Gelber (Denon PG-6009 - CD)

Transient behaviour; bass (AG)

Julian Bream: Baroque Guitar (RCA Victor SB-6673 - LP)
Tonal accuracy (JK)

Britten: Four Sea Interludes & Passacaglia From Peter Grimes; Sinfonia da Requiem - Andre Previn/LSO (EMI ASD 3154 - LP)
Image scale; bass (AG)

Iacomo Carissimi: Jephthah, The Judgement of Solomon, Jonah - Gabrieli Consort & Players/Paul McCreesh (director) (Meridian CDE 84132 - CD)
Imagery, coloration (AG)

Chopin: Piano Sonatas - Vlado Perlemuter (Nimbus 5038 - CD)



Tonal balance; transparency; focus; timing (CB)

Copland/Corigliano: Clarinet Concertos - Bernstein; Prelude, Fugue & Riffs - Richard Stolzman/LSO/Lawrence Leighton Smith (RCA Victor Red Label ED87762 - CD)
High frequency & high level resolution (AG)

Josquin: Missa Pange Lingua - Tallis Scholars (Gimell CDGIM 009 - CD)
Ambience; size of image; voice; clarity; harmony; integration (JB, CB)



When you've got this many records, give us a call and the Choice team will come round!

Mahler: Symphony No 4 -
Eliahu Inbal/Frankfurt RSO
(Denon 33C37 7962 - CD)
Depth of image (AG)

Mozart: Great Mass In C
Minor - John Eliot Gardiner,
cond. (Philips 420 210-2 - CD)
Scale; voice; sibilants;
transparency; stage depth
(CB)

**Ruggiero Ricci/Brooks
Smith:** Paganiniana - The
Genoan's Legacy (Water Lily
Acoustics WS06 - LP)

Acoustics; strings quality;
tonal accuracy; naturalness
(PM, JB)

Shostakovich: Symphony
Nos 6 & 11 - Paavo
Berglund/Bournemouth SO
(EMI SLS5177 - LP)
Dynamics (No. 11) (AG)

Richard Strauss: Four Last
Songs/Metamorphosen/
Oboe Concerto - Gundula
Janowitz/Herbert von
Karajan/Berlin Phil (DGG
Galleria 423 888-2 - CD)

Midband accuracy (AG)

Vivaldi: Four Seasons -
Neville Marriner/St Martins
In The Fields (Argo 2RG654 -
LP)
Total brilliance (DH)

Non-Classical

Jeff Beck: *Guitar Shop* (Epic
463 472-1 - LP)
Instrumental emotion, power
capabilities; real world
dynamics (DH, JB)

Tracy Chapman: *Tracy*

Chapman (Elektra 960 774-2 -
CD)
Vocal quality (PM)

Ry Cooder: *Paris, Texas* (WEA
252701E -LP)
Superb engineering (DH)

Cookie Crew: *Born This Way*
(Let's Dance) (FFRR CD19 -
CD single)
Integration; coherence;
rhythm; timing (CB)

Billy Cotton: *Wakey Wakey!!*
(C5 C5-513 - LP)
Stereo spread; transients;
midband clarity; applause
(KK)

Depeche Mode: *Personal Jesus*
(CD BONG 17 - CD single)
Bass extension (KK)

Willy DeVille: *Assassin Of
Love* (Polydor 887 312-2 - CD
single)
Vocal textures; three-
dimensionality; image height;
transients; bass extension and
control; attack; midband
clarity; stage depth; detail;
imaging (KK)

**Al DiMeola/John
McLaughlin/Paco De Lucia:**
Friday Night In San Francisco
(Philips 6302137 - LP)
Imaging (JK)

Bob Dylan: *Planet Waves*
(CBS 32154 - LP)
Realism (DH)

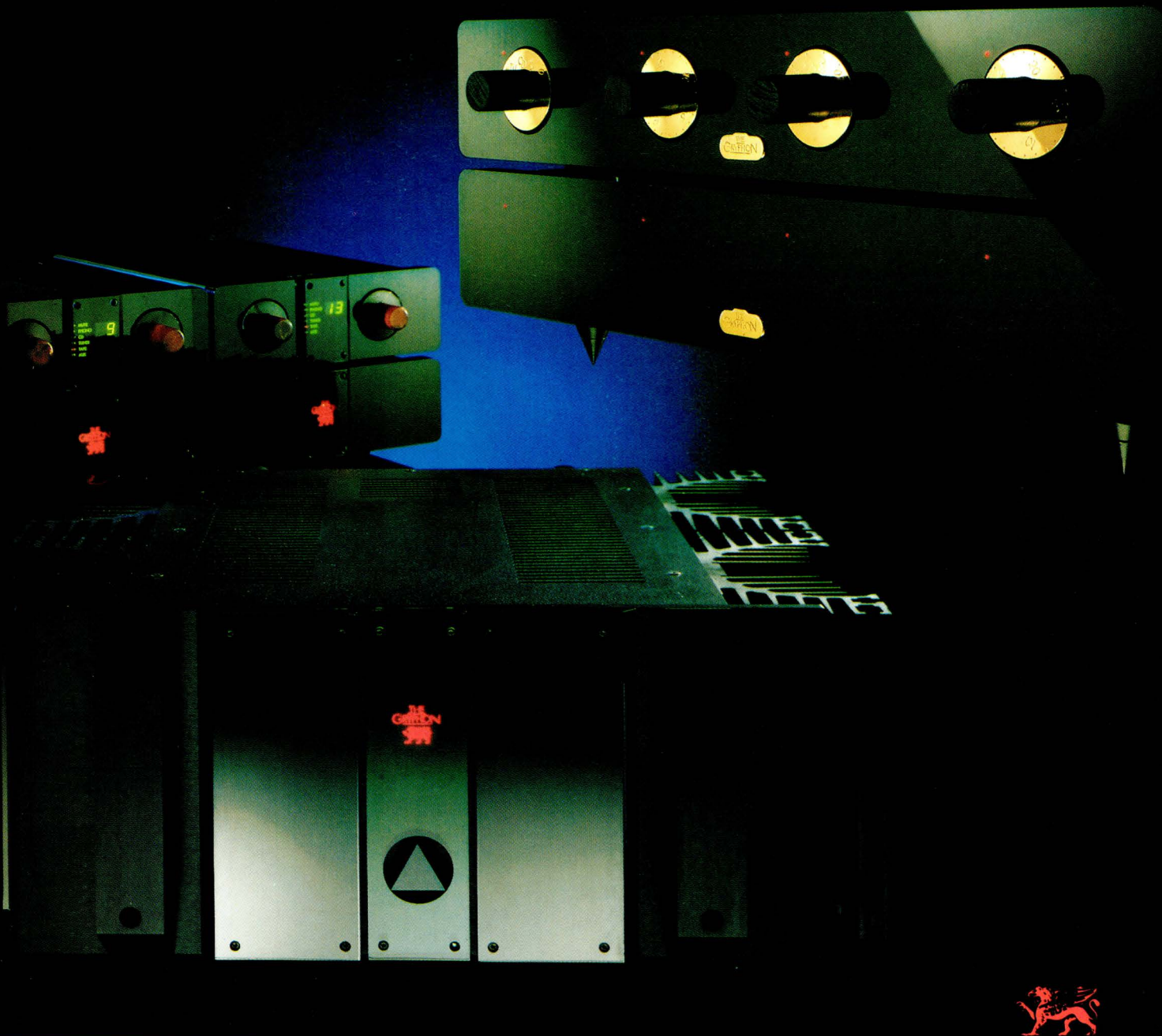
Philip Glass: *Koyaanisqatsi*
(Island ISTA4 - LP)
Bass extension (JK)

Jim Hall Trio: *These Rooms*
(Denon CY-30002 - CD)
Imaging; brass quality (PM)

Hellcats: *Cherry Mansions*
(Rose ROSE LP 146 - LP)
Energy (DH)

Dick Hyman: *Plays Fats*

GRYPHON®



Gryphon Distributors: **Norway, Sweden, Denmark:** 2R Marketing 4586 151588. **Italy:** Esoter 24693849. **Singapore:** Reference audio 338 5577. **Saudi Arabia:** Audio - Tech, 26656702. **Hong Kong:** Audio Supplies, 5249377. **Korea:** Bando-pro 588 1815. **Japan:** Noah Corporation, 38331721. **Australia:** The Audio Connection, 708 4388. **Switzerland:** Hi Fi Müller, 01 262 3700. **Taiwan:** Bun Hong Trading Co., 5916133. **Greece:** Absolute Audio: 99522578. **Benelux:** Cadenza: 04108 13078. **Indonesia:** PT Gramuda Utama 62216590688. **USA & Canada:** Gentronics 416 670 0894.





Waller (Reference Recordings RR-33CD - CD)

Tonal balance; depth; width; scale; transparency; integration; dynamics; realism (CB, KK)

Mark Isham: *Castalia* (Virgin V2513 - LP)

Depth of image; dynamics (JB)

Kodo: *Heartbeat Drummers of Japan* (Sheffield Lab CD-KODO - CD)

Bass power; extension and control; dynamics; power handling (PM)

Harold Lanchberry: *La Fille Mal Gardee* (Decca SXL 2313 - LP)

Dynamics (JK)

Led Zeppelin: *The Song Remains The Same* (Swan Song SSK89402 - LP)

Bass extension (JB)

Level 42: *Level 42* (Polydor POLS 1036 - LP)

Bass accuracy and slam (JB)

Little Feat: *Sailin' Shoes* (WEA K46156 - LP)

Timing; rhythm (JK)

Lynyrd Skynyrd: *One More From The Road* (MCA

MCSP279 - LP)

Live sound (DH)

John McLaughlin Trio: *Live At The Royal Festival Hall* (JMT 834436-2 - CD)

Digital fidelity (JK)

Lincoln Mayorga and Amanda McBroom: *Growing Up In Hollywood Town* (Sheffield Lab - LP)

Dynamics; imaging; stage; transparency; frequency balance (CB)

George Melly; Nick Mulligan & His Band; The Saints Jazz Band: *The Saints Meet The Sinners* (C5 C5-512 - LP)

Stereo spread; natural sound; live feel (KK)

Joni Mitchell: *Dog Eat Dog* (Geffen GEF 26445 - LP)

Dynamics; detail; timing (CB)

Moving Hearts: *The Storm* (Son BUA892 - LP)

Sound of Uilleann pipes (PM)

New Order: *Technique* (Factory (FCD 275 - CD)

Focus; imaging; bass (CB)

Juice Newton: *Greatest Hits* (Capitol CDP 7 46489 2 - CD)

Transients; sibilants; vocal clarity (KK)

Gram Parsons: *Grievous Angel* (Reprise K54018 - LP)

Vocal subtlety (JK)

Oscar Peterson: *Pablo Live At Montreaux '77* (Pablo 2620105 - LP)

Live sound (DH)

Lou Rawls: *At Last* (Blue Note CD BLUE 7 - CD single)

Vocal textures (KK)

Robbie Robertson: *Robbie Robertson* (Geffen WX133 - LP)

Low level information retrieval (DH)

Bruce Springsteen: *Born To Run* (CBS 69170 - LP)

Speed; dynamics (DH)

Martin Stephenson & The Daintees: *Gladsome Humour And Blue* (London UK KWLP8 - LP)

Detail (DH)

Dave Stewart/Barbara Gaskin: *Up From The Dark* (Rykodisc RCD 10011 - CD)

Vocal purity; bass timing (JB)

Sting: *Bring On The Night* (A&M BRING 1 - LP)

Reproduction of a 'live' musical event (JB)

Radka Toneff and Steve Dobrogosz: *Fairytales* (Odin CD-03 - CD)

Vocal quality (PM)

Yello: *Flag* (Mercury 836-778 - LP)

Stereo width and depth; dynamic contrast (PM)

Frank Zappa: *Meets The Mothers Of Prevention* (Rykodisc RCD 10023 - CD)

Bass extension and control (JB)

Frank Zappa & the Mothers of Invention: *One Size Fits All* (Discreet K59207 - LP)

Retrieval of low-level information (JK)

Frank Zappa: *Sheik Yerbouti* (CBS 88339 - LP)

Low level information (JB)

Frank Zappa: *Tinsel Town Rebellion* (CBS 88516 - LP)

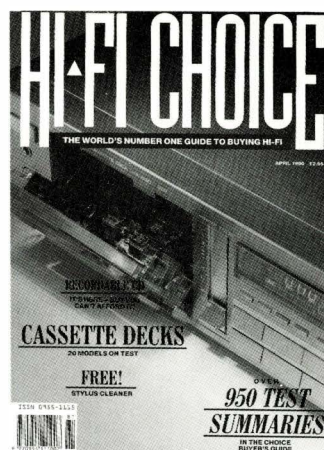
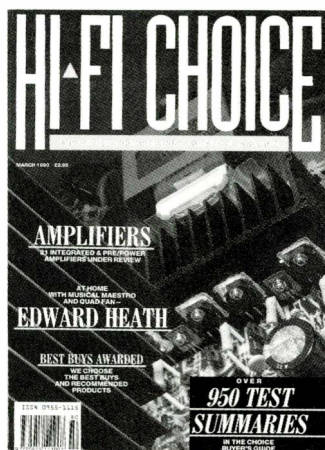
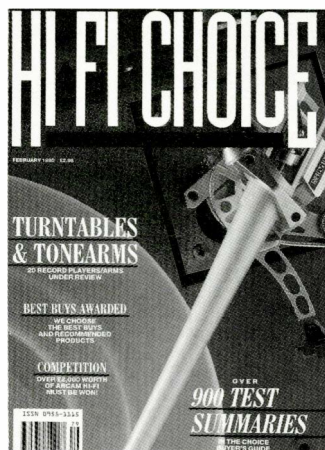
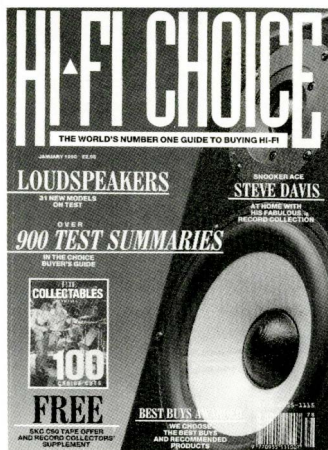
Great live music sound quality (JB)

Frank Zappa: *You Can't Do That On Stage Anymore, Vol 3* (Zappa CDZAP 17 - CD)

Low level information; transient response (JK)

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.



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Also includes: Cassette tapes
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- May 89 CD PLAYERS (70)
Also includes: Satellite and subwoofer loudspeakers
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- May 90 LOUDSPEAKERS (82)
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Keeping a tight rein . . .

. . . or how to get great sound without frightening your bank manager. John Bamford outlines a system, capable of quite remarkable sound quality, which costs just £1,000 (give or take a few quid) and will give many more costly hi-fi setups a close run for their money.



Some of you are doubtless looking for audio nirvana. Others among you have paid your £3.95 for this year's *Collection* edition of *Hi-Fi Choice* simply to be entertained. ("Now then, if I could afford a state-of-the-art hi-fi set-up, I'd put my Rega Planar 3, NAD 3020 and KEF Codas in the bedroom, and go for that dream system made up of. . .")

As the editor of *Hi-Fi Choice* magazine, I'm pretty serious about my hi-fi, as you might imagine, so I've put considerable effort into acquiring a good living room in which to enjoy listening to music. A vast percentage of my monthly pay cheques over the last decade have gone into what makes really good hi-fi systems sound so exhilarating in the first place: having a good room in which to enjoy them.

Turn it down!

What began as a very run down grocers' shop in a side road off a busy south London high street, five years later I'd converted into a narrow town house. The shop included a damp, disused basement - which I'd planned from the beginning to

open up into a basement living room where no-one could shout, "Turn that ruddy hi-fi down" as the chimes struck midnight. So I've been blessed in recent years with having a good-sized room (some 26 feet long by 14 feet wide) in which to experiment with all kinds of hi-fi components. And while different listeners clearly enjoy different aspects of any one system's sound characteristics - with some audiophiles

seemingly blissful when listening to small (but tonally ever-so-pure) systems - one of my personal goals has been to strive for what is probably a futile nirvana: real-life *scale*. While it can be argued that I'm wasting my time in trying to recreate the live 'concert hall' experience of hearing my favourite band from a prime seat in the stalls of the Hammersmith Odeon, I'm sure having a lot of fun trying!

The room is great, actually, because I don't disturb any neighbours and none of the walls are parallel (always a good omen for trouble-free acoustics). Having a room this size *has* presented unexpected problems, however. Due to the room layout, one is forced to sit a long distance from the loudspeakers, and with the room being long and narrow the sound is prone to 'tunnelling' toward the listening seats. And large loudspeakers capable of moving large quantities of air in order to 'energise' the room with sound have become *de rigueur*. The bonus of having a room like this, of course, is that you can house huge floorstanding loudspeakers capable of fabulous bass performance. This is why I have ended up using a Rock Reference turntable as my 'reference'

system source. With a hi-fi system capable of resolving information down into the infra bass regions, you need a front-end capable of accurately resolving that kind of low frequency information without losing 'control' and muddling the sound.

Wot? No room for it?

But what if your room is small, and you simply haven't enough space for a large system? How can you even begin to approach lifelike sound in your living room if you haven't the space for racks of huge power amplifiers and those gorgeous towering speakers you heard in the hi-fi shop last week?

While I would argue that there's little point in spending a fortune on state-of-the-art amplifiers and top-flight speaker systems if you haven't enough space to allow them to 'work' properly, there are ways to enjoy a 'big' sound nonetheless. And it need not cost a fortune, thanks to the arrival a year or two back of KEF's C15/C200SW satellite and stereo subwoofer loudspeaker system. Sold as a package called *Quattro* at just £379, these speakers deliver a full range sound with really superb dynamics and imaging properties which put many more costly 'esoteric' and fashionable designs to shame. What's really important to me, however, is the fact that they can reproduce impressive scale, even in a small 12 x 12ft listening room. They're so good, in fact, that I've used them in my 26ft long room with the little C15 satellites perched on top of 4ft tall stands - and with the two subwoofers providing masses of low-end 'grunt' I almost fooled my brain into believing that my ears were listening to 4ft tall floorstanding loudspeakers!

I've driven the KEF *Quattro* system with all manner of esoteric source components and amplifiers. One of my friends uses a Musical Fidelity A370, another uses Audio Innovations triode valve amps. But if



A system to beat at £1,000-or-so: Systemdek IIXE with Moth tonearm and Shure VST V cartridge, Pioneer A400 amplifier and the KEF Quattro satellite and subwoofer speaker system (also pictured on the left).

funds are tight, just try them with the award-winning Pioneer A400 (£229). I won't harp on about the A400 here because it has already been discussed at length in the pages of *Hi-Fi Choice* in recent months. It's been a prime topic for discussion in other hi-fi magazines too. So suffice to say that this little 50W integrated amplifier, which was designed to sound as good as possible at an affordable price, with no superfluous tone controls, switches or flashing lights which might detract from the purity of its sound, is presently the talk of the UK hi-fi scene.

Choosing a source

Which brings us to a choice of source component for our 'high-end system on-the-cheap-which-will-sound-fantastic-in-small-rooms'. There are any number of CD players, which, at £300 or so, will keep the cost of the system to well under £1,000. You could choose a 'punchy' and dynamic performer - such as Marantz's excellent CD50 for example (16-bit DAC) - or a softer, smoother, and more laid-back sounding player like the Rotel RCD 865 (1-bit PDM DAC). Come to think of it, were you to settle for the Marantz CD40 at just £199, you could add a budget-priced tuner and a cassette deck and spend not much in excess of £1,000. I'd like to hear a £1,000 midi system which could even begin to compete with such a system in the sound quality stakes!

But no, as I set out at the beginning to come up with a system which had pretensions to high-end audiophile sound performance, I decided to settle for the outrageously good Systemdek IIXE turntable (£248) with Moth arm (£78). (The arm, manufactured by Rega Research, is an absolute steal.) Choose a compact disc player if you will, especially if your collection of LP records is nothing to brag about, but when you have a system with this much transparency, and when the record player you can afford is a good as the IIXE, you will appreciate quite easily when you listen why so many audiophiles (myself included) continue to prefer the more natural and lifelike sound quality available from gramophone records.

Natural upgradability

A simple belt-driven deck with suspended subchassis and outboard electronic power supply, the Systemdek IIXE comes fitted with glass platter and felt mat and has proved over recent years to be a natural partner for the Moth tonearm. A neat upgrade, if funds can stretch to it, is a kit supplied by the Audio By Design company of Brighton, comprising an acrylic platter and metal armboard to replace the standard Medite issue (the new 900 Systemdeks have metal armboards as standard). Cost of the kit, which clearly improves the transparency and dynamics of the record player and

increases the resolution of low-level details hidden in recordings, is £70.

The overall cost of this system - which in combination sounds in many ways like a really expensive set-up - could be kept to the bare minimum by using a low-cost but quite serviceable cartridge like the Goldring 1012 (£40). In the end, though - and, again, because this system was supposed to be a touch 'special' - I installed a Shure VST V (£158), recommended highly by our vinyl replay expert Richard Black. Tested in issue No. 85 (August 1990), this high output model is far more than 'just another of those up-market magnetics', which tend to hover uncomfortably between affordable models and more fashionable moving coil designs. The VST V is unflappable, with a highly accurate response, a refined Micro Ridge tip profile and excellent tracking - and in this system gives us the benefit of not needing to employ the Pioneer amplifier's MC phono input.

So there you have it, a system which many a hardened audiophile would happily enjoy listening to without craving too much for the sound of full-range floorstanding loudspeakers and massive Class A power amplifiers. In toto it provides a true taste of what high-end audio is all about, at a price which is little more than you might spend on a TV set and video recorder. I reckon that's not a bad deal.



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Aspirations takes a stroll down memory lane, picking out some of the best-sounding systems we've encountered during the last three years.

By Dan Houston.

Best of the Best

Why do people spend so much money on hi-fi? The short answer is they don't. High-end systems count for a tiny proportion of sales of separates. The statistics expert G&A Marketing Services puts sales of turntables costing more than £250 at only two per cent in terms of volume; CD players costing £300 plus account for just nine per cent of separates sales. G&A doesn't keep records of more expensive purchases but it is a fairly safe bet to assume that in terms of 'audio-philosophers involved', the high end market is extremely small.

Aspirations seeks out the few who do spend exorbitant sums on hi-fi. Over the last three years *Choice* has covered some 40 different systems in the home. This article is a collage of those which have sounded the best in their setting. It is important to note that room environments make a huge

difference to the sound of any hi-fi; if you have moved house and set up your system you may have noticed how long it takes to 'get used' to the sound of your new room.

There aren't any rules about systems for *Aspirations* - although being a through-the-keyhole feature we weren't able to write about a Hell's Angel who used a Voyd *Reference* in a squat (though we considered changing the title to *Desperations!*). Most of the equipment

we have photographed and listened to has been expensive, although the features tend to fall into two categories: through-the-house link systems and purist hi-fi. This feature doesn't cover through-the-house systems because generally these are not about superlative sound, and of course *The Collection* is about the best sound available. There are exceptions to this, the most impressive being a





Far left: King's solution to through house sound. Ricardo's gramophone gives absolute sound (left).

banking couple's house in West London (issue 57) where Robert King had installed a superb sounding separates system and run it to four rooms. The system contained one of the best CD players I've heard - a *Sonograph SD1* (by Conrad Johnson). Amplification was both unusual and excellent, being a *Burmester Pre 846* and pair of *Dr Thomas monobloks*. Two of the living rooms delivered very high quality sound, via a pair of *SD Acoustics SD3* loudspeakers on the first floor and a pair of *Celestion SL600s* on the ground floor, where the system was housed.

Who buys it?

Ask Doug Brady, the veteran London high-end dealer, why his customers spend such exorbitant sums of money on hi-fi and he says: "Firstly, they all tend to have a sincere and powerful love of some kind



Top of the tree: Ricardo Franassovici at home.

of music - be it classical opera or MOR.

"Secondly they like to have quality articles which are well made and perform excellently. They are certainly not all rich; sometimes it's a guy who lives in a council flat. It's not a beautiful house with beautiful furniture, but he does have a huge record collection and a great hi-fi. It's his one centre of excellence and he can put on a record and forget his job and screaming kids. It's very healthy to be at the top of the tree in something."

The person who is arguably at the top of the high-end tree in the UK is Ricardo

Franassovici who runs Absolute Sounds and distributes much of the equipment which has graced the pages of *Choice*. Ricardo's system was featured in last year's *Collection*, and the price tag was put at something near £85,000. The sound, needless to say, was unreal, and it was difficult to tear ourselves away from his sofa. Ricardo tells me little has changed in his system since our visit. "But a system like that refines itself over the years; it was new when you came and you didn't hear it sounding at its best," he says in his Gallic drawl. The understatement isn't lost on us.

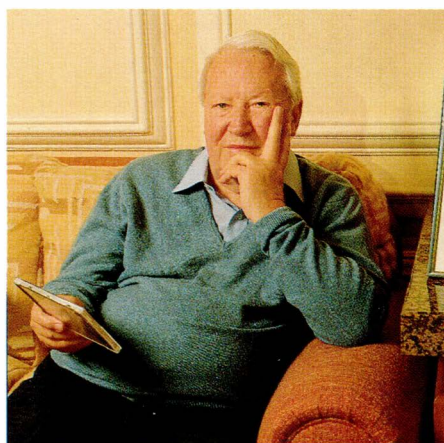
Name dropping

Aspirations has also seen its share of famous audiophiles, many of whom use their record collection and hi-fi as the way to relax from public life.

The first of these was the Earl of Chichester, a classical music buff and member of the board of the Covent Garden Opera who featured in *The Collection* 1988. John Chichester used an Absolute Sounds system with Oracle *Delphi III* turntable, Audio Research and Krell amplification and Apogee *Caliper* speakers in the drawing room of his 18th century Wiltshire manor house.

We also discovered (in issue 67) that Radio One DJ Gary Davies uses Sony ES gear in his London house, and that Snooker champion Steve Davis (issue 78) used a Linn *Sondek*, Krell amps and Magneplanar loudspeakers, before he married and moved in August. If we tell people of Steve's definitive record collection of soul music - too many to count let alone listen to - we get gasps of disbelief!

When we visited Ted Heath at home in Salisbury (issue 80) and asked him whether he considered his Quad system made him an audiophile he answered: "What the bloody hell does that mean?" Lord Gowrie, on the other hand, the President of the Federation of British Audio, and Chairman of Sothebys, is a long-term audiophile who has run the gamut of upgrading since the Fifties. Granting us a rare interview, he told us he had bought his Apogee *Calipers* after reading about, and then hearing, John Chichester's system. Spending nearly £14,000 on a CD playing system, he said he had it sounding 'about 80 per cent as good as my Linn *LP12* (Alphason *HR100S* arm and Koetsu *Red Signature* cartridge)',



Gulf hero Heath uses Quad, DJ Gary Davies favours Sony while Steve Davis is snookered for choice of records.

worth around £2,000. The amplification for his system was through an Audio Research *SP11* preamplifier and Musical Fidelity *A370* power amp.

The man from SME

One of the first audiophiles we visited was ARA (Alastair Robertson-Aikman), founder and Managing Director of SME - the tonearm, and latterly turntable specialist. ARA's house, built in the 1950's, is situated near his factory in Steyning beneath the Sussex downs on the Adur valley. In 1976 ARA's famous music room was built as an extension to the house, and the uncompromising search for sonic perfection began.

The room was built on a grand scale. It measures 11 by seven metres, and is plushly decorated in the rococo style, complete with flickering 'candle' crystal chandeliers, about an acre of Chinese carpet and several Victorian landscape paintings by Sidney Percy. The effect of a salubrious hometheatre is achieved by a pair of curved staircases which lead in from the adjoining rooms.

But the players at this theatre aren't seen, and our original feature





Above: Quad speakers match Ted Heath's Steinway. Left: The Earl's Apogee.

bore the title: *The Art of Concealment*. ARA's constantly evolving hi-fi system is mostly concealed in ornately carved bleached oak cabinets, with internal shelving that can be changed to suit the needs of different sized components. On show during our visit was the Goldmund *Reference* turntable - a solid £19,000 worth of audio exotica, which had so far foiled any attempt to conceal it. Next to the Goldmund, but hidden under the lid of the smaller of the oak cabinets were a couple of 'spare' Oracle turntables, and below these the controls of an Audio Research *SP11* preamplifier. The system is easily accessible from the listener's seat, called 'the stereo seat', in front of the tan leather sofa at the back of the room.

The audience at the theatre doesn't even see the speakers at the other end of the room. These are concealed behind a

proscenium arch and acoustically transparent curtain. ARA uses two pairs of heavily modified Quad *ESL63* electrostatic speakers, with each channel driven by a massive Krell *Reference* monoblok power amplifier. ARA had previously used dozens of *Electrostatics* but has opted for just four as the best method with this system.

Each pair is placed at right angles to each other, so that one faces forward to the listener, while the other is edge on. ARA's approach to the bass light character of the Quad's has been to add substantial stiffening, with 75lbs of distributed mass by means of six solid brass cross members - clamping the stator firmly within its frame. Mass loading is further enhanced by 100lb billets of steel placed on top of each speaker.

The result was awesome. . .

While SME tonearms have found fame, and obviously some fortune, for the company around the world, ARA has for several years wanted to make a reference turntable of his own. At the Chicago consumer electronics show this summer he launched the *Model 30* - a £10,000 contender for the Goldmund crown.

Of the changes he has made in his home system since we visited in 1988 he (naturally) has a '30 playing centre stage, with *SME V* arm and Clearaudio *Insider* cartridge. "It's been an unbelievable leap forward," he said. "You just don't notice that it's there at all - it's much much faster, and the sound floor is lower. But it's quite complicated to explain and you should come and compare the two together."



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Where else can one hear a couple of turntables like that jousting in a system which is itself the culmination of 30 years seeking the best hi-fi components around? It's in the diary.

Urban regeneration

While most of the audiophiles we've visited have been staunch supporters of the vinyl sound we *have* heard excellent results from CD-based systems. The venue that always springs to mind when we talk about the merits of CD is a purpose-built penthouse flat on the southern bank of the Thames overlooking Tower Bridge and the City of London.

The flat belonged to a middle-aged couple who relocated to London from Hertfordshire after their children had grown up and left home. Architect Simon Conder was commissioned to design the interior which was a shell when bought. Inspired by the couple's new furniture - and principally a round dining table and chairs designed by Charles Rennie Mackintosh, he set to work to create an environment where monochromatic furnishings and decor complemented personal artifacts and irregular room dimensions. Conder's belief is that people and their belongings - their *objets d'art*, should give a home its colour and warmth.

Visitors are drawn into the flat via a corridor which snakes its way into the main living space where two pillars support a gently sloping ceiling. The flat is mostly open plan, with a dining area on a raised black marble dais, overlooking the Thames as far upriver as St Paul's Cathedral.

Around one of the pillars a cabinet has been built which contains the hi-fi equipment. The system is extremely simple; and in itself follows the clean minimalist lifestyle of the owners. The cabinet contains a Meridian 207 CD player, driving a pair of PS Audio power amplifiers. On either side the loudspeakers were perhaps the most interesting facet of the feature. They are called *Amadeo*, cost £3,500 and were purpose-built. The owner had become sick of trying to find a loudspeaker which he could live with - both sonically and visually. He commissioned the veteran driver-designer Ted Jordan and Simon Conder to produce the speakers - and founded a company with the aim of selling them himself. *Amadeos* use two rear-firing bass drivers and four mid-treble units (which face inwards two-thirds of the



ARA has spent a lifetime perfecting his system at home.

way up the front of the speaker) in separate loading chambers.

The speakers never made a name for themselves, and only a few pairs were made. But if memory serves even reasonably well, it is a mistake that they are no longer around. They disappeared both in terms of performance and styling. The system produced an awesome level of dynamics and an imagery, depth and reality which is so often missing in CD based equipment. And while the room design is supposedly far from perfect for acoustics (if you ask any of the experts on the subject) it worked very well in this instance, soaking up echoes and creating a truly inspiring atmosphere to a musical evening. My notes at the time mentioned some brightness but the soundstage, clarity, and most of all the reality, of that system had to be heard to be believed.

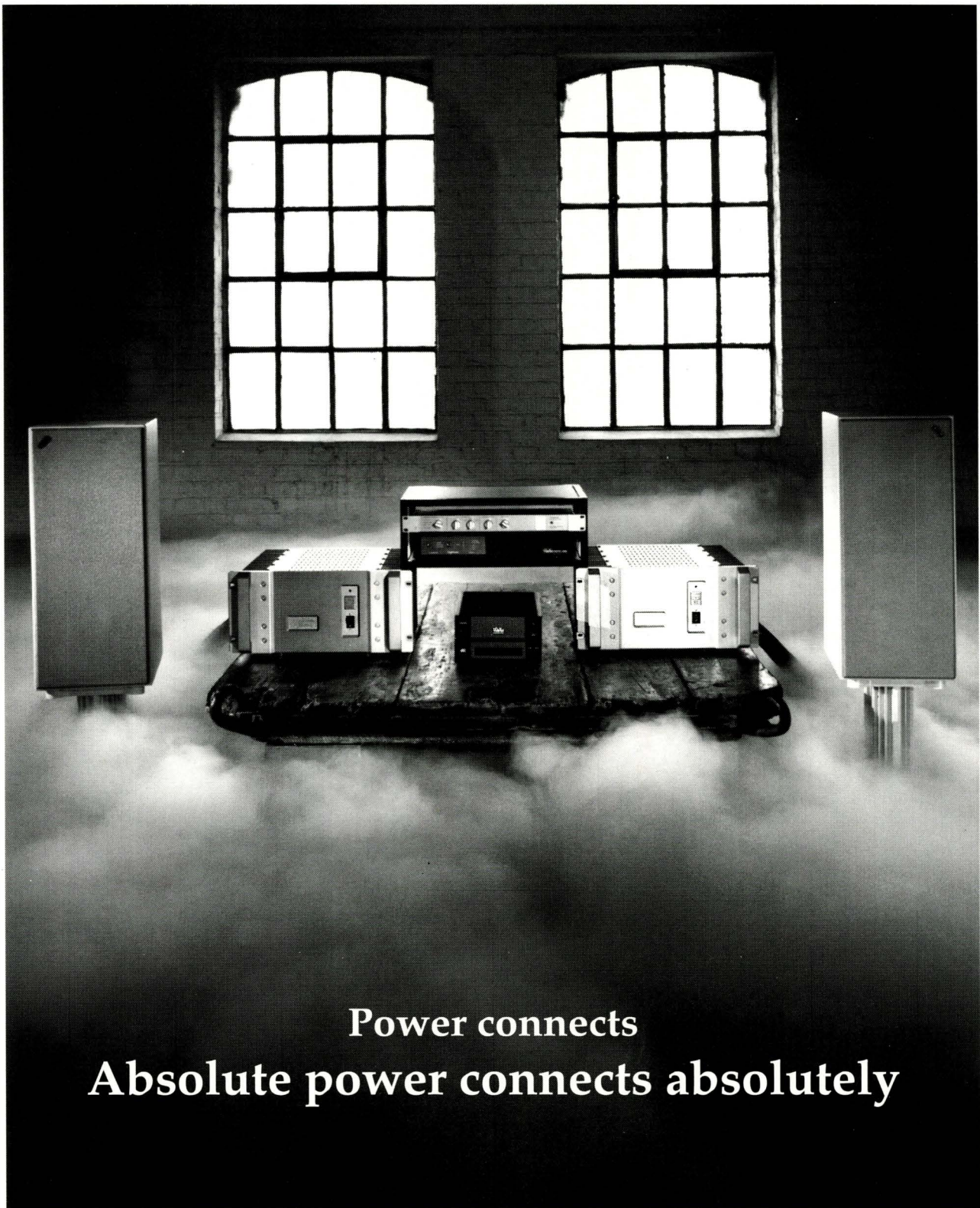
Bose over Chelsea

Further up-river we came across another stylish flat overlooking the new Chelsea

Harbour development. Here the property developing owner, David King, was also loath to install large loudspeakers which would detract from the similarly monochromatic tones of his home.

He also opted for CD, but having a comprehensive record collection from his days as a DJ (about three cupboards full) had installed a mini studio in his dressing room, with a couple of Technics *SL1210s* to mix music onto cassette tape. His main living area - which takes up one half of a floor in the imposing Belvedere tower, is furnished with leather sofas by Aram Zeev, a colossal glass table designed by Norman Foster, tables by Eileen Gray, Corbusier recliner. . . the list goes on. It also features a huge painting by Ron Bowen of The Slade, and Bowen painted a series of murals around the walls.

It is kitted out with a Denon CD player, Meridian pre and power amplifier combination and three pairs of Bose *Acoustimass* loudspeakers as advised by KJ Westone, of London W1. While not an



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audiophile system, the speakers deserve a mention for their ability to deliver a gobsmacking scale of dynamics, and are a thoroughly reasonable option when style dictates the need for a minimal hi-fi presence. The *Acoustimass* consists of two minuscule satellite drivers, and a separate subwoofer which can be, and was in this case, tucked out of sight behind furniture to provide bass frequencies. Bose creates a successful optical illusion with these speakers; you look at the satellites, hear the bass and can't quite believe what you're hearing. King was also using a Quad system with Tannoy *Birminghams* in his Mayfair flat and has used hi-fi since his teens. His impression of the speakers was that they were very competent sonically, and ideal in terms of style.

The cars

Recognising that audiophiles sometimes like to drive an automobile, *Aspirations* has covered several high end ICE systems (ICE being the cool word for in car entertainment). By coincidence we featured a couple of classic Ferraris kitted out by Mike Wells, of Fulham, London, during the same month as their designer Enzo's death in 1988. One of the cars was a 1973 Daytona Spyder, the other a 275GTB made in 1966. The sports cars belonged to international champion yachtsman Bruce Owen, and both commanded a value which was well into six figures. Even as a passenger the experience of driving in them was memorable, being G-forced back into the red and white striped leather seat with each and every gear change.

Due to the cars' vintage and condition, Owen wanted a sound system with just



Rear view of the stunning Amadeos. Sadly, they never made it to production.

the controls to hand. Having obvious loudspeakers, and banks of garish gadgets would have detracted from the cars' classic interiors. But being an audiophile with a sophisticated hi-fi at home he also wanted the best possible sound.

Mike Wells specialises in such systems, hiding away power amplifiers, CD autochangers, subwoofers and the sort of

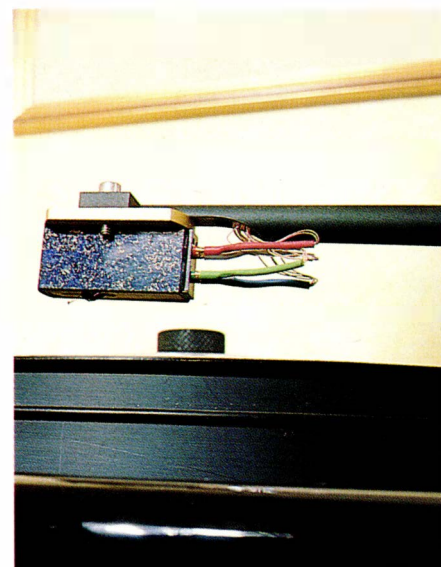
speaker cable many people would like in their home systems. Both these Ferraris use Sony radio/CD based systems, with ten-disc autochangers in the boot. Massive Nakamichi eight-inch subwoofer units are mounted onto the back shelf, while Alpine and Nakamichi amplifiers, (one for bass one for mid and treble frequencies) are cased into the back of the boot using the same lining material.

Musicality aside, the beauty of these systems is in the installation. The Wells team concentrates on making ICE as aesthetically pleasing as possible and the workmanship is up to factory-fitted standard. When mounting the head unit in the Daytona's central console for instance, Wells' 'trimmer' scoured London leather merchants for a matching piece of hide to cover the console so that the system looks original. Careful placement of the loudspeakers means that (Boston Acoustics 751) units were installed in the provided position - on the lower forward part of the door behind chromium grilles.

The result isn't cheap, these installations cost around £3,500 apiece - more than many would dream of spending on a 'proper' hi-fi system. But even with



Classy sound from the engine, classy sound from the hi-fi: Bruce Owen's Daytona.



The world's most expensive cartridge: at £3,500 the Kiseki 'Lapis' should be.

decided to sell off three cases of vintage Chateau D'Yquem. . . and buy a pair of Jadis JA30 valve monoblocks. Doesn't seem much until you look at the price tag on the Jadis; £1,900. . . each! Perhaps as a salute to his departed Sauternes dessert wine, Nigel decided to install the amps on Sicomin isolation platforms in his wine cellar, underneath the listening room. Checking the thermometer while we were down there he confirmed that the rest of his wine was maturing at just the right temperature.

Nigel had only recently acquired the hi-fi bug, and his £22,000 system, from KJ Westone, was an upgrade from an Aiwa cassette deck and pair of Wharfedale Active Diamonds.

The set-up was installed and supplied by KJ Westone, of London. The main source was a VPI turntable with Airtangent air-bearing tonearm and the Kiseki *Lapis Lazuli* cartridge (surely the world's most expensive needle at £3,500?). Additional sources were a borrowed Micromega CDF1 CD player, Sony Pro-Walkman cassette deck (useful for training) and Rotel tuner. Peter Sanhen's SP1.5 solid state preamplifier fed the Jadis and the result appeared through a pair of piano lacquered Audioplan Kontrast loudspeakers.

Asked recently if he had upgraded the system, Nigel said: "No. In the future I might bi-amp the system, maybe putting in another pair of Jadis amplifiers, and I will probably get a CD player eventually because so much stuff is released only on CD. The other thing might be to move house and have a proper listening room. But at the time I bought what I wanted instead of what I could afford, and I've no special wish to upgrade at the moment.

"I've actually been getting into Nicam video and I bought a JVC machine which sounds fantastic through the system. We put the TV between the speakers last night

Audioplan speakers reflect the maquette of a dancer in their lacquer finish.

the hood down on the Daytona, and with the V12 engine cranking over at 6000 RPM, the sound had an effortless ease about it which made listening a real pleasure. One is bathed in music so that gear changes and the snarling engine seemed curiously distant. Nor was there any hint that the hard suspension character of the cars would upset the tracking of the CDs. Here especially the portable nature of compact disc, along with its clean sound, came into its own, and the mini library of ten discs in the boot is a much easier option than

having to use compact cassettes.

The real thing

One of the endearing aspects of writing *Aspirations* features is meeting audiophiles who are absolutely unequivocal about the results they want from a gramophone. One such, featured in June 1989, was Nigel Stainton a 30 year old living in Buckinghamshire who gave up his job as a wine merchant to pursue javelin throwing - full time.

Teetotal in the name of his sport, Nigel



After dark, Audio Innovations amps glow like Manhattan's skyline.

and watched *Hunt For Red October*, that was stunning."

Family man

The stroll down memory lane, or rather leafing through past issues, wouldn't be complete without an Audio By Design system. Fiercely in the analogue camp, Audio By Design markets the Voyd turntables and American Snell loudspeakers as well as making the Audio Innovations valve amplifiers.

Harry Manfield is a graphic designer by day but Audio By Design addict by night, at his house overlooking the Wey valley just outside Guildford in Surrey.

At the time of our visit, Harry's listening room was spartan and just contained his hi-fi, a sofa and armchair and record collection as well as a couple of prints on the walls. The room is, however, ideal for the purist audiophile. The house had belonged to a musician before Harry and his family moved in and the listening room had been a music room; the walls were soundproofed to make them



What to do when the wine's a little cool? Install Jadis amps in the cellar of course.

acoustically dead.

The lineup here was bought from Audio South of Farnham, and fronts with a Voyd turntable (using a split power supply), Helius Aureus arm and Audionote IO cartridge. Harry uses an Audio Innovations Series 1000

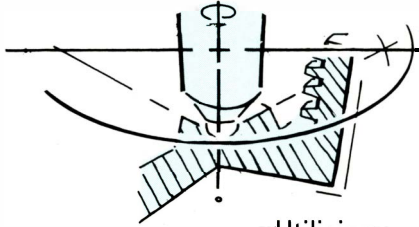
preamplifier and *First Audio* power amp, except at parties, when he beefs up the sound by hooking up a *Series 800* rather than the more delicately sounding *First Audio*. A pair of imposing but plain Snell *Type E* loudspeakers on Pirate stands transduce the results which were so close to nirvana for Harry that he described himself as 'hooked on hi-fi'.

Harry is another audiophile we have been able to contact, who has upgraded since our visit last December. "It's much better now," he declared, "I've put a Helius *Orion Mk1* arm on the turntable, it's an arm specifically made for the *IO*. I've also bi-wired the Snells using Audionote *Silver* wire. It's terribly expensive, but it's really cleaned up the sound especially at the frequency extremes; the top end sounds a lot cleaner. The other thing I've done is to get a proper power supply for the amps and turntable. I'm using a Linwood *Advanced*; that has really made a difference as well. It takes out the spikes (in the mains) and cleans up the sound - the system sounds smoother now."

Left: The Voyd... and fairy toothbrush.



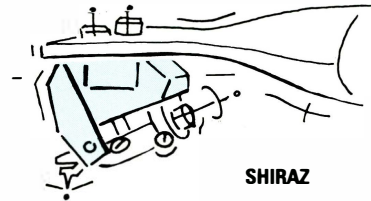
WHEN IS A TURNTABLE NOT A TURNTABLE?



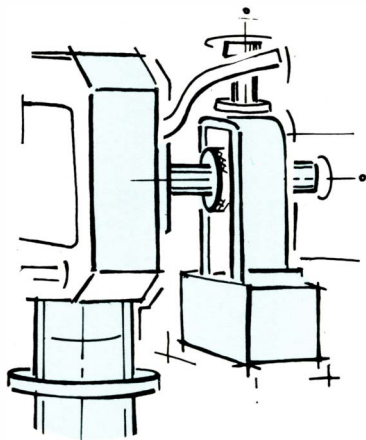
XERXES

No larger than a pocket calculator the Roksan ArtaXerxes Cartridge Amplifier is an amazing piece of design.

Utilising some of the most advanced electronic components available the ArtaXerxes sets new standards for analogue performance.



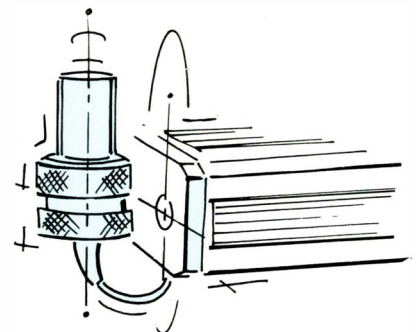
SHIRAZ



ARTEMIZ

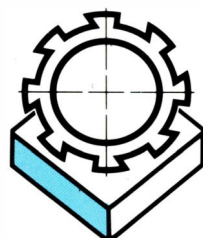
Fitted inside the Xerxes turntable and used in conjunction with the much acclaimed Roksan Artemiz tonearm and Shiraz cartridge, the ArtaXerxes both amplifies and equalises the signal from the cartridge. The ArtaXerxes can then be plugged directly into the line input of your amplifier, giving quite breathtaking results.

No longer need you feel restricted in the choice of amplifier by the quality, or indeed absence, of the phono stage. It is also apparent that with the ArtaXerxes the humble turntable requires another title!



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Zeus Audio, Hope Street, Belfast, Northern
Ireland, (0232) 332522

Zeus Audio, 18 Castle Caulfield Road,
Donagmore, Dungannon (08687) 61935

NORTH

Aston Audio, 4 West Street, Alderley Edge,
Cheshire, (0625) 582704

Chris Brooks Audio, 29 Gaskell Street,
Stockton Heath, Warrington, (0925) 61212

Chris Brooks Audio, 10-12 Oak Street, Hazel
Grove, Stockport, (061) 419450

Doug Brady Hi-Fi, Kingsway North,
Warrington, (0925) 828009

Norman Audio, 131 Friargate, Preston, (0772)
53057

Sound Organisation, 16 Gillygate, York, (0904)
627108

W. A. Brady & Son, 401 Smithdown Road,
Liverpool, (051) 733 6859

MIDLANDS AND EAST ANGLIA

Audio File, 2 Foundry Walk, Market Hill,
St. Ives, Cambs., (0480) 66123

Audio File, 40 Hockerill Street, Bishops
Stortford, Herts, (0279) 506576

Alternative Audio, 93 Hobs Moat Road,
Solihull, West Midlands, (021) 742 0254

Creative Audio, 9 Dogpole, Shrewsbury,
Shropshire, (0743) 241924

Leicester Hi-Fi Co., 6 Silver Walk, Leicester,
(0533) 539753

Sound Approach, 161 Unthank Road, Norwich,
Norfolk, NR2 2PG,
(0603) 622833

Shropshire Hi-Fi, St. Michael's Street,
Shrewsbury, Shropshire,
(0743) 232065

Steve Boxshall Audio, 41 Victoria Road,
Cambridge, (0223) 68305

West Midlands Audio, 158 Ombersley Road,
Worcester, (0905) 58046

SOUTH EAST

Acoustic Arts, 101 St. Albans Road, Watford,
Hertfordshire, (0923) 245250

Chichester Hi-Fi, 7 St Pancras, Chichester,
Sussex, (0243) 776402

Doug Brady Hi-Fi, 18 Monmouth Street,
London, WC2H 9HB, (071) 379 4010

Musical Images, 45 High Street, Hounslow,
Middlesex, (081) 569 5802

Newbury Audio, 2 Weevers Walk, Newbury,
Berks, (0635) 33929

Photocraft Hi-Fi, 40 High Street, Ashford, Kent,
(0233) 624441/2

The Powerplant, 66 Upper North Street,
Brighton, BN1 3FL, (0273) 775978

Reading Hi-Fi Centre, 4 Queen's Walk,
Broadstreet Mall, Reading, Berks, (0734)
585463

Sevenoaks Hi-Fi, 111 London Road,
Sevenoaks, Kent, (0732) 459555

Sevenoaks Hi-Fi, 34 Mount Ephraim,
Tunbridge Wells, Kent, (0892) 31543

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Hill, Sussex, (04442) 42336

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Middlesex, (0895) 30404



Linn power

Ever since Ivor Tiefenbrun launched the Sondek LP12 onto an unsuspecting world in the early Seventies, the man and his company have been at the centre of controversy. Still rabidly analogue in a world disappearing into its own digital navel, Ivor's ambition is to produce 'the last record player'. Barry Fox visits Linn Products' hi-tech factory and talks to the man who just won't go away...



Linn's factory was the first purpose-built automated plant in Britain.

For years, gramophone turntables were casually written off as the least important link in the hi-fi chain. Then, in 1973, Ivor Tiefenbrun starting making them at his father's precision metal works near Glasgow. His sales pitch, initially spread by word of mouth, was the then-outrageous idea that the turntable was the most important link in the chain.

With hindsight, the Tiefenbrun logic is obvious. A pick-up cartridge extracts sound from the groove of a gramophone record by sensing vibration of the stylus as it tracks the passing groove. It will thus also pick up any spurious vibration from

the turntable mechanics and act as a microphone which receives sound from the room. A lot of the sound will be coming from the loudspeakers; this creates a feedback loop between speakers and turntable which adds amplified noise at the resonant frequencies of the mechanical parts of the gramophone.

The ostensibly simple solution is to build a turntable which produces no spurious vibrations of its own and is acoustically isolated from the room. But this means grinding mirror smooth bearings for the moving parts and suspending the working parts on springs tuned to damp out mechanical vibrations. Most hi-fi factories know about electronics, but not mechanics. Acoustic Research built an isolated turntable but failed to get its message across.

Getting the message across

Tiefenbrun's metal works was just the place to build a turntable, and Tiefenbrun was just the man to get the message across. He formed Linn Products, launched the *Sondek LP12* and let it be known that anyone who did not notice an improved sound was either deaf or did not like music. Try singing along with the *Sondek*, he would say, in between being rude to the hi-fi press and trade.

The worrying thing for the press and trade was that his wretched turntable did make records sound better.

By the late Seventies, the *Sondek* had become the reference point against which all other turntables were judged, and Linn started to branch out into the manufacture of other hi-fi products, first loudspeakers and later amplifiers. Sales were so good that in 1985 Linn commissioned Richard Rogers, architect of the Pompidou Centre in Paris and Lloyds building in London, to design a new factory in the countryside outside Glasgow.

Tiefenbrun has always been a provocative self-publicist, saying outrageous things and believing at least some of them. His staff work on the 80:20 rule of thumb. The trick is to know whether 80% is deliberately rubbish or just 20%, and which statements fall into which category. It's a trick few have mastered.

The easy and obvious way to explain Tiefenbrun's hatred of digital audio is that success for CD means a drop in turntable sales. But when I visited Linn's factory in Glasgow five years ago, one team of boffins was working on an Artificial Intelligence computer project and another was designing a CD player. I tried hard, but I never could understand

the AI project enough to write about it, and I was sworn to secrecy on the CD project. No CD player was ever launched, because Tiefenbrun was not happy with the results.

I recently visited the new factory where Linn's boffins were still working in the back room on CD technology and still not happy. But in the meantime, Linn has developed a professional digital encoder, the *Numerik*, which the company uses to make CD recordings released on Linn's own record label, while selling the *Numerik* to recording studios for over £20,000 each.

By chance, my visit coincided with a factory tour organised by the DTI for managers from large "establishment" companies. It was clear that none of them, including the accompanying Man from the Ministry, had been prepared for what they were about to experience.

Ivor despises the business and financial establishment in general, and the government (any government) in particular. He also thinks that British industry has got it wrong. And Japanese industry, too. If only he weren't so successful, it would be most convenient



A provocative self-publicist, Ivor is no stranger to controversy.

to brand him a crank.

The Linn philosophy is simple. "If it sounds better, it is better".

How long does Linn think it can go on making gramophone turntables?

"We think the real competition to the LP is the cassette, not CD. Half our turntable sales are to people with a CD player. But the record companies say the LP is dead, so there is a loss of confidence in the LP. That's why we want dealers to

give demonstrations. Most people haven't heard an LP properly. There's information on the records they have never retrieved. It's our ambition to make the last record player."

Initially, Linn built in the traditional way, with a production line. Then Tiefenbrun clashed with the unions. They rejected a 24% rise because of the 4% Social Contract in force at the time. After that, he banned unions and at the same time went over to "single stage build". Everybody in the factory makes a complete product and is fully responsible for it, from start to finish.

Automation

The new factory is geared to this philosophy. There is an automated warehouse in which everything from component resistors to finished amplifiers and turntables are stored. Automated trucks, all under computer control, search out all the parts that are needed and deliver them to the work stations where staff assemble finished products. Average response time from calling up a part to getting it is ten minutes.

"For designing a new product, we usually pick someone who knows nothing about it," Tiefenbrun tells his visitors. "Their task is to make something that sounds better. That's a good way to ruin five or six years of someone's life".

Linn has been in the new factory for three years. Tiefenbrun still smarts at the planning battle.

"We had to fight the planners who recommended the site to us in the first place. It's in a development zone but they won't even let us put up a sign outside. They complained about the appearance of the factory, even though you can't see it from the road."

Linn's current turnover is around £9.6 million with a staff of 150. Tiefenbrun does not want many more people under one roof because he feels that is the way to lose touch with the workforce. There is room for another building on the site.

"But bearing in mind the priority given by the government to essential services like retail shops, banking and estate agents, I doubt we'll raise the money for something as unimportant as manufacturing".

Every Japanese firm with a factory in Britain complains, ever so politely, about the quality of locally sourced machines and components. Tiefenbrun is rather more frank. He complains about warehouse equipment made by "some



The Linn factory was designed by the man behind the Pompidou Centre.

'nice' company in West Germany - they promised it in six months and after eighteen months it still didn't work.

"Quality of components is our main difficulty," he goes on. "We are being driven further and further afield. Here in Glasgow there is no problem because they are frightened I will cut their noses off. But across the border they feel safer. More and more supplies are coming from Japan. We find Japanese suppliers are more willing to fly to Scotland and fix a problem than an English supplier.

"We are disgusted by the quality of some suppliers. It's utterly, abysmally bad. Thirty per cent of the printed circuit boards don't work. That's why there's such a big business in fixing faulty boards in Britain. Up here in Scotland, IBM's factory soaks up the capacity of the best suppliers and fixers. We have five people here just repairing faulty boards from outside suppliers.

"We get our transformers from Scotland, but more and more is coming from the Far East, from sophisticated manufacturing countries like Taiwan, Malaysia, Singapore. While the British government puts money into companies like Plessey, GEC and British Aerospace - people who don't need it - those countries put money into the companies that do need it.

"We aim to stock three weeks' worth of components and three weeks' worth of finished product. We don't have an order book. We build to forecast and we get paid in seven days. Japanese factories have around nine months' product tied up in the distribution chain after manufacture. All that talk about 'just in time' sourcing is a lie. I believe in 'just in case'. You only have to be short of one label or one screw and that will stop the whole business. We have to rely on five hundred suppliers, over a hundred of them major. We can't afford not to have components in stock in case they let us down.

"I'll tell you a typical story about

suppliers. They come to us and say they want to supply a precision component. So we invest in tooling and they start off with a reject rate of about 70%. Then, after a lot of hard work we get them down to 10%. It creeps up again, we get tough, and it goes down again. That

happens in cycles. Then they say our prices are unreasonable. I get a summons from the managing director who is usually someone really familiar with the manufacturing industry, like a Middle Eastern accountant. He is wearing an expensive suit with a gold watch and he says he doesn't want my business because it's too demanding. It turns out he's suddenly busy with an order from someone big, like Jaguar.

"And I say, we taught you how to do the job; if it wasn't for us you wouldn't be able to supply Jaguar. Without us you won't be able to keep up your standards. In eighteen months you will be back again.



"And sure enough they are. We see it with loudspeaker cabinet manufacturers. They double the price. One actually had the cheek to say it was because Sony had cancelled an order. They wanted us to pay because they had lost a customer.

"In that case we had to pay because we needed the product. But of course we found someone else and they were out of business within a year.

One to one

"If we have a problem with a casting, we send the guy who does the machining out to the casting foundry to talk to the man who pours the metal. That's far better than me having dinner with his boss and both of us pouring wine and talking small talk, and at the end of the meal neither of us knowing what it was that we've said."

Linn's finished goods are delivered direct to its network of specialist hi-fi dealers. "We were the first to use Rupert Murdoch's TNT for European delivery.

"For designing a new product, we usually pick someone who knows nothing about it," Tiefenbrun tells his visitors.

"Their task is to make something that sounds better. That's a good way to ruin five or six years of someone's life".

Everything went smoothly until we hit the cretins in Customs. They are the KGB of Governments."

Tiefenbrun admits his own mistakes, too. As he shows his shell-shocked visitors round the research labs and the latest Computer Aided Design equipment, he volunteers: "We used that for our first amplifier, but we were in too much of a hurry. We made things too complicated. It was a typical engineer's product. For instance, we had this great idea of putting an electronic lock on the controls, so that guests couldn't fiddle with them at parties. But people ended up locking themselves

out of their own equipment. Sales were successful, but as a lost opportunity, it was a catastrophe. It was like the death by a thousand cuts.

"We learned a valuable lesson. Never skip the model stage. You have to fight against engineers who say: 'Why is a minute of a customer's time worth more than five years of my time?'"

On production lines . . .

"Britain pioneered the production line [*What about Henry Ford in Detroit? - Ed.*] to optimise the use of scarce skills. But times have changed. Production line speed is governed by the slowest stage.

"I started off with a production line, pretending I was General Motors with seven people and forty-seven buffer stores. It was a disaster. Quite simply, if you are building anything to a standard, you can't use a line. Apart from anything else, if you design a product so that one person can build it, then one person can fix it if it goes wrong. We don't use inspectors. Everyone is responsible for his or her own inspection.

"On a line, you lose reaction time at each stage. That's the time it takes for someone to look at what they have got to work on as it arrives at their work point.

"It's as simple as this. Look at the total production and divide by the number of people producing. In some TV factories you end up with around one and a half sets a day. An individual can make more than that. Hospital operations don't work on a production line, do they?"

As his guests leave, Tiefenbrun tells of the Government Trade minister who had visited Japan before visiting Linn.

"He had been to Japan once and thought he knew everything. I've been a hundred times and I know how little I know. He told me he was puzzled at the amount of automated machinery they had, but only used for part of the time.

"Minister, I said, how often do you use your willy? It's handy to have it when you need it, though."

The Sondek LP12 - still a reference to many audiophiles.



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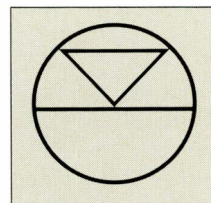
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Some people who sell hi-fi would just as soon sell you a food mixer. Or a toaster. Or a washing machine. It's all the same to them because they treat hi-fi as if it were just a commodity. Others, by way of contrast, are music enthusiasts. They specialise in hi-fi and they enjoy helping you choose the right system. All of the Linn dealers listed overleaf fit into this category. But they don't just sell Linn. So you can listen to our hi-fi and compare it with other good systems. You'll find it very easy to hear the difference because you'll be mixing with the right company.



LINN



TO SOME SHOPS IT'S A HI-FI

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

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041-226 4268
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278 ST VINCENT STREET 041-248 4079

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0922-57926

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SOUND ADVICE,* 162 ALCESTER ROAD
MOSELEY 021-449 3328
GRIFFIN AUDIO,* 94 BRISTOL STREET
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CAMBRIDGE
CAM AUDIO, 110 MILL RD. 0223-60442

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THE STEREO SHOP, 94 NORWICH ROAD
0473 233832

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MARTINS HI-FI,* 5 HIGH ST. 0553-761683

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

MILTON KEYNES
AUDIO INSIGHT,* 53 WOLVERTON ROAD
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NORTHAMPTON
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BASICALLY SOUND, OLD SCHOOL
BRACON ASH 0508-70829
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STRATFORD-UPON-AVON
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25 HENLEY STREET 0789-414533

WOLVERHAMPTON
CLEARSTONE HI-FI, 39 VICTORIA STREET
0902 772901

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WEST MIDLANDS AUDIO
158 OMBERSLEY ROAD 0905-58046

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

BANBURY
OVERTURE LTD., 3 CHURCH LANE
0295 272158

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

BISHOPS STORTFORD
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0279-506576

BRIGHTON
SOUNDWAVES (BRIGHTON), 1 YORK PLACE
LONDON ROAD 0273-695776
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0273-609431

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

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LINN

Acoustat *Spectra 11*

Reference Imports, Pineridge, Sandy Cross, Heathfield,
East Sussex TN21 8BS. Tel: (04352) 4481

Bargains are rare in the high-end, so it's a pleasant surprise to find that there is a panel-type loudspeaker with all the hallmarks of costly exotica but at a price just under £1,095. While this is hardly a giveaway in the land where £99 speaker systems outsell all others by a factor of probably 20-to-1, the Acoustat *Spectra 11* is still a bargain relative to the maximum which one can spend. Most astonishing is that the speaker is imported, yet it remains affordable despite importation costs.

The *Spectra 11* is a hybrid 'tower-style' panel which occupies floor space of only 380 x 355mm; it stands 1.85m tall. The styling was dictated by function, so the speaker is plain and therefore unlikely to call attention to itself for any reasons other than its height. The bottom section is a box housing a 200mm paper-coned woofer which crosses over at 250Hz to the upper section, a shallow panel fitted by bolts and wooden uprights to the woofer enclosure. This contains mirror-imaged electrostatic elements utilizing Acoustat's SPECTRA technology, in which the width of the transducer varies inversely with frequency.

The SPECTRA-style driver's entire array operates for bass frequencies, while only selected portions are activated for the midband frequencies; even smaller sections of the electrostatic element provide the highest frequencies. Acoustat calls this 'magnetic steering', an effective blend of the benefits of single and multiple drivers. Most prominent among the gains resulting from SPECTRA technology is freedom from beaming, which means that the *Spectra 11* doesn't suffer from the 'hot seat' dispersion which makes many electrostatics suitable for only one listener at a time.

Energizing the electrostatic panel is accomplished via separate mains adaptors for each speaker, so allow for an extra pair of mains outlets. Speaker connection is via multi-way terminals, but the speaker

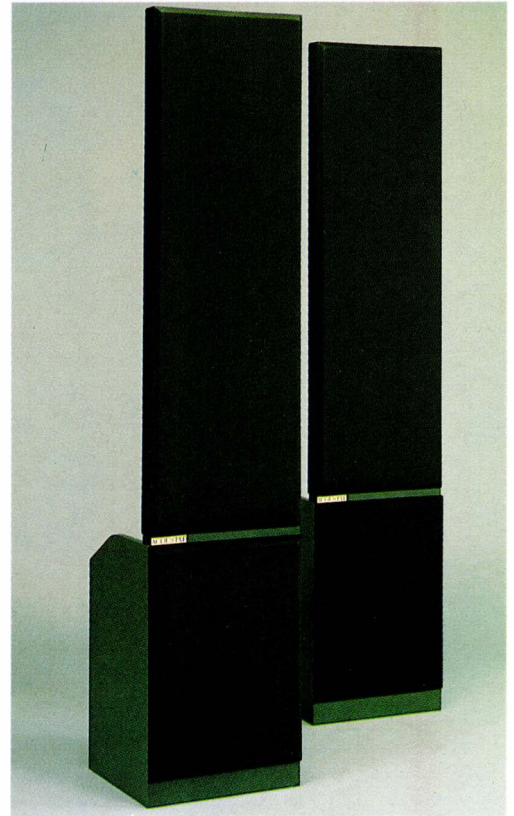
is not bi-wirable - a sensible exclusion allowing for the speaker's hybrid topology.

Sound Quality

Because of bass quantity and extension which reveal that the *Spectra 11* is a hybrid - lower octaves which one wouldn't expect from so slim a panel were it a full-range design - it's almost assumed that the transition from cone to panel will be detected easily. And it's true that certain material betrayed the speaker, especially recordings where bass is a primary instrument, mixed well to the fore. It is best described as a change in 'character', the bass being somewhat richer and more dense and therefore less neutral than the rest of the spectrum.

A minor tizziness affected the upper-mid/lower treble region, a 'hi-fi' quality which added minor artifice to what is still a smooth, natural performance. Sibillane could prove problematic, therefore, with some recordings.

With satisfying bass allied to a typically open-sounding electrostatic array and a convincingly large and impressive soundstage, the Acoustat is able to sound 'big' and to suggest that the listener is in a room larger than is the norm for most British homes. This is a benefit which makes the *Spectra 11* special, and one which - if absent - would have seriously compromised the speaker because the *Spectra 11* is designed for small rooms. Why Acoustat deems this so is difficult to say, as the speaker can yield levels which would make it satisfactory in rooms as large as 5x6m and the dispersion is wide enough to fill the space in front of an audience larger than might occupy a 3 x 4m space. Whatever the ultimate room-filling capabilities of the *Spectra 11*, it manages to 'sing' in a space more likely to house two small boxes on stands, so audiophiles with space limitations are as



well served as those with fiscal restraints.

Transparency, one of the trademarks of electrostatics, is the trait which separates the *Spectra 11* from similarly priced conventional systems. An addictive quality, it provides an openness which few boxes can mimic; possible exceptions include the Sonus Faber *Electa*, the ATC *SCM20* and similar quality mini-monitors. Speed also separates the mid and treble performance from the lower registers; again this illustrates the hybrid nature of the speaker, but it should not be seen as compromising what otherwise seems to be the best low-cost alternative to the stunning but much dearer Quad '63.

Conclusion

The *Spectra 11* rewrites the cost of high-end ownership not just by virtue of its sensible pricing. It's easy to assemble and install, siting and toe-in are quickly determined by ear, the impedance is a safe 4ohms and the speaker can be driven by decent amplifiers producing as little as a 'real' 75 watts. For enthusiasts with a limited budget who have long craved the kind of performance associated with speakers requiring a mortgage, the Acoustat *Spectra 11* at £1,095, might be just what you are looking for.

The Hi-Fi Choice Panel

Apogee Stage

Absolute Sounds Ltd., 58, Durham Road, London SW20 0DE. Tel: (081) 947 5047

Ever since the legendary and original Apogee, the company's been promising us smaller, cheaper and friendlier 'ribbon' principle loudspeakers. Apogee's engineers kept their word, and developed a range of models, from the three-way *Diva* to the *Duetta*, followed by the *Caliper*. If the *Caliper* was about half the size of the magnificent original design, then the new *Stage* is one third the size, visually similar to a Quad *ELS63* in scale, but in style, unmistakably Apogee. The current *Caliper Signature* costs £3,350 and the *Stage* comes in at £2,395 - still a lot of money, but a sum which I hope to justify in this review if my first impressions are reliable.

Standing a little over a metre high on their unobtrusive spiked but adjustable angle bracket feet, the *Stages* look comparatively at home in my room, considering that they are a broad flat panel design. The review pair was finished in charcoal with rounded edge sidebars made from rosewood adding a distinctive touch. My own *Duetta Signatures* look unclothed by comparison. No attempt has been made to disguise the two operational elements or diaphragms; their vertical section is a true ribbon, a freely suspended aluminium and kapton treble radiator whose virtue is an almost total lack of self resonance or tonal error. This is principally achieved by a long magnetic field which provides uniform driving force over the whole element.

This 65cm high radiator offers a fabulously wide frequency range (for a tweeter that is) of 100Hz to 15kHz and allows for a gentle crossover transition to the other section (covering bass midrange) at a low 700Hz. The larger semi-trapezoidal radiator is a pseudo-ribbon. It may be a lightweight film element magnetically driven substantially over its effective area, but it is not freely suspended like the treble section. Instead, it is clamped at the edges like a drumskin, while a

combination of its geometry and differential tensioning over its height helps dispense what would otherwise be a severe one metre open drum resonance. At a distance, it looks like a metal foil sheet, but, in fact, it is finely cut into a ladder of sinusoidally perforated zigzags to form an extended conductive path correctly aligned over the alternating magnetic field generated by fixed bar magnets behind the diaphragm. Likewise, the tweeter ribbon is subdivided into three sections to increase the path length.

Other Apogees have single side conductors, while, to raise the sensitivity and the amplifier matching impedance, the *Stage* has a second set of conductors on the reverse side of the plastic film support structure. The ribbon is open at the rear and is truly bi-polar. Extensive perforation in the rear plate of the bass mid-assembly helps it to closely approach this goal. The lack of box or cabinet is certainly a visual feature while its absence also contributes strongly to the high sound quality this model produces. There are simply no box or cabinet resonant noises present to disturb the reproduction.

In use, they need careful placement and adjustment to give their optimum performance, including care with levelling and floor spiking, plus a position at least 0.8m from the back wall. Listening height is also quite critical and they need to be set for your head height when you're seated normally in your favourite chair.

These speakers may be cheap by Apogee standards, but no concessions are apparent in terms of resolution, and poor ancillaries are quickly revealed just as the true merit of top class equipment is seen to be brought out. This comment applies to all links in the chain from the cable to the CD player and the turntable.

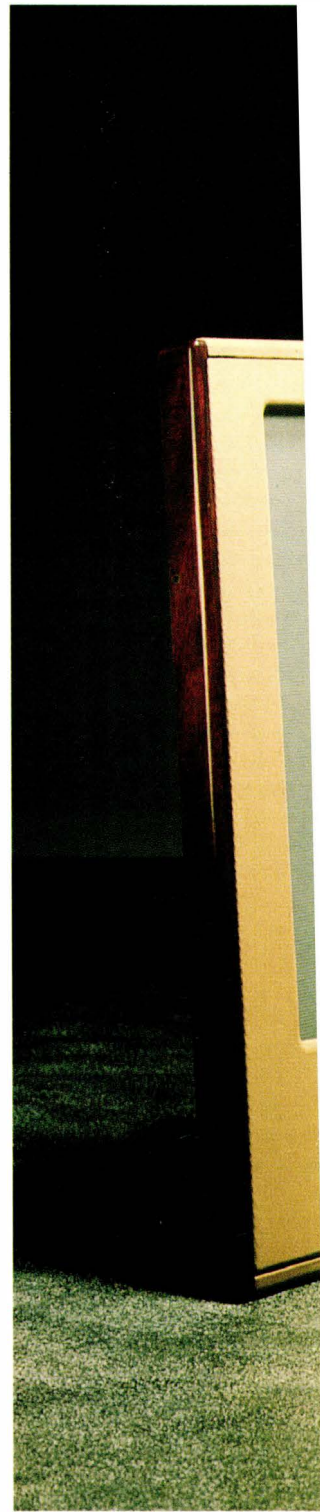
Sound Quality

Immediately seductive, these speakers have a lush, glowing midrange which

leaves much on the market for dead. The treble isn't bad either, and while bass was not its strongest point, it is able to tell interesting stories here as well.

Before one becomes acclimatised, and ultimately overcome, two obvious flaws are apparent. However, such was the long term appeal of this model that I soon began to feel that they did not matter so much. Flaw one is in the treble, and has three elements - a trace of grain and edge in the midtreble, followed by an early roll-off subjectively above 13kHz or so, and finally, a rather narrow projected beam in the treble which did not drive to room acoustic well, lending a rather dry dulled sound to the treble. The room effect was of less air and openness.

The other flaw concerned the bass, which has almost, but not quite managed to overcome the bass drum sound voiced as an enthusiastic thump a little above 40Hz, with negligible bass extension heard below this point. Faster sounding and less coloured than a box reflex boom, it adds some false weight to the bass, helping the speaker to sound bigger than it really is. Careful speaker and listener positioning can help to ameliorate the bass thump, though it never goes away completely.





Pure and seductive, the Stage's charm is spellbinding.

bi-wired and bi-amped, partnered by a brace of Krell KSA 80B and driven by the Meridian 602-603 £3,000 CD player combo, with analogue disc supplied by a Goldmund Studio/T4/Koetsu Rosewood Signature II, via a Krell KSP 7B preamp.

Except in terms of image height, scale, bass extension and power handling, the Stages conceded nothing to the top Apogee models or other competing speakers.

Conclusions

This report reveals the Stage to be imperfect. Yet these imperfections are peripheral to its main achievement, namely excellent purity, transparency and believability over its most vital central regions of the audible frequency range. Its achievement here outweighs the weaknesses to such a degree that many reviewers have been taken over by this speaker and lose all critical balance.

Against that wonderful sound must be set its low efficiency, moderate maximum sound level, critical placement, the bass 'thud' effect with limited

bass extension and a rather dull room acoustic. Well, I have warned you. Now go and buy a pair!

Martin Colloms

After this critical section, one falls under the spell of the speaker's enveloping charm, from the upper bass through the mid to the fine treble. Mid treble integration is excellent, and this, plus its tonal neutrality represent Apogee's best effort to date, in my view.

These speakers are some of the most transparent I have had the pleasure to use. Stage depth is seemingly effortless while they can also focus very well - not the strongest feature with many other planar or panel speakers. Due to room limitations, I could not achieve the same stage width as is possible with an Acoustic Energy AEI or a KEF R105111, for example.

Consistently, reed sounds, musical

instruments, vocals and ambience were reproduced in a believable manner. The speakers have the ability to put beauty into reproduced music, and in this respect they bring the listener close to the original. Remarkable as it may seem, they can do this on a wide range of CD material. Often this can sound rather brittle and mechanical when reproduced on many conventional moving coil speakers.

Despite the dry room energy sound, the Stages manage to sound lively and informative and are also very detailed over the dominant frequency range. Thus the flaws are overcome in the mind of the listener.

My best results were finally obtained

GENERAL DATA

Type: bi-polar open back panel, ribbon and pseudo-ribbon technology, two way
Sensitivity: equivalent to 83db/W, 1m, (8ohms)
Maximum sound level: 98dBA, (pair in 0.80 cu.m. room)
Loading: 3ohms nominal, predominantly resistive
Frequency range: 40Hz to 15kHz
Recommended amplifier power/ch: min 50W max 200W
Placement: free space, critically levelled
Dimensions (w x h x d): 66 x 95 x 5cm
Weight: 60lbs, 27kg
Options: treble cut, bi-wire
Price: £2,395

Audio Note *Ongaku*

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

If I were to tell you that in Japan they build stereo valve amplifiers with an output of 27 watts costing nearly £30,000, would you believe me? If you are an avid reader of *Hi Fi Choice*, chances are you would, but the uninitiated would be forgiven for thinking I'm pulling their legs. Even looking at the Audio Note *Ongaku* doesn't exactly make you think that here is easily the most expensive amplifier on sale in the UK, perhaps even Europe. Only when you hear just how much silver is used in its construction or when you attempt to pick it up do you realise that here is something that might well set you back a few quid.

What we have here is a seriously esoteric product, one that only the very few will ever be able to own, but equally one that other amplifier designers could learn from. Which is primarily why Audio By Design has brought this sample into the country - as the manufacturer of Audio Innovations valve amplifiers, the company needed a reference that offered true state-of-the-art performance. Being the UK distributor for Audio Note made the choice somewhat easier, but the company's boss Peter Qvortrup wouldn't have paid even the trade price if the *Ongaku* wasn't 'the business'. And that it would certainly seem to be.

To a student of the Japanese school of high-end audio design, the Audio Note *Ongaku* is as close to the ultimate amplifier as you are going to get. Once one has established that the triode vacuum tube is the ultimate amplifying device and that silver is the best material to conduct audio signals with, it is difficult to take amplifier design much further than Hiroyasu Kondo has with the *Ongaku*. He has used General Electric 211 direct heated triode output valves operating in single ended mode and connected each (there's

only one per channel) to an output transformer wound with pure silver wire. Each one of these contains 4kgs of 0.05mm silver wire which has been hand wound under a microscope. If you can imagine how long a piece of wire that thin would have to be to weigh that much, you'll have some idea of just how painstakingly this amplifier has been constructed. To call it fanaticism is an understatement.

Not surprisingly, the passive components in the *Ongaku* have been very carefully selected, some of the more critical capacitors, for instance, are made with silver foil with a paper and oil dielectric. Resistors are handmade tantalum film types, all internal wiring is Audio Note silver and the amplifiers casing is copper. This lot adds up to over 40kg of brightly glowing and very hot amplifier that produces 27 pure class A watts into 8ohms.

Sound Quality

The *Ongaku* was designed to drive efficient loudspeakers and particularly horns, which are very popular with serious audiophiles in Japan. I have heard it with a pair of such speakers and have to admit that my Snell *JlIs* are barely able to do it justice by comparison, but they don't disguise the facts either.

And the fact is that the *Ongaku* is as transparent an amplifier as I've heard. What sonic signature it does have is so incredibly subtle that it proved completely elusive during the six short weeks that it graced my system. The *Ongaku* replaced Audio Innovations' *Second Audio* monoblocks in the system, adding another ten watts and a good 20kg, and it's primarily with them that it was compared. Hardly fair really, replacing two and a half grands worth with something like this, but the *Seconds* are very good - they make much of the competition sound flat

and uninformative. But next to the *Ongaku*, comparisons become truly odious.

Basically, the *Ongaku* does everything very, very well. But its clarity is like nothing else, and after the *Seconds*, it's like opening the curtains on a crisp spring morning, or going from grey to white - the clarity almost sparkles. But, as you get used to that, your attention is drawn to other aspects of its capabilities.

Given an effectively recorded, mastered and pressed record, it can recreate a musical event in your living room.

Images are correctly scaled, solid and tactile, the sound stage is as deep and wide as the recording allows and the dynamics are masterful. I've not heard a system that comes anywhere near this for dynamic accuracy - it's not so much the differences in loudness as its inability to become muddled or make acoustic notes sound anything other than utterly convincing and natural. Next to amps that compete with it on clarity, it's this sense of naturalness that brings home the *Ongaku's* lack of coloration - voices and instruments sound so believable.

Despite the above, the *Ongaku* does something that is possibly even more appealing: it reproduces bass in such a solid and articulate fashion that it can completely blow you away. Perhaps it's because other amps do a reasonable job at high and mid frequencies that this aspect of the *Ongaku* stands out - the balance is





The Ongaku - probably the best amplifier in the world. . .

drop much below 4ohms will not reveal the results noted above. For instance, it was quite happy driving a pair of Snell Type Cs which weigh in at 87dB in the efficiency stakes and have a fairly benign impedance.

The amp's sheer invisibility means that this review relates closely to the sound of the Voyd/Helius Cyalene/Audio Note IO, 'Innovations Nova step-up transformer, 'Innovations First Audio preamp (prototype), the *Ongaku* acting as a magnifying glass to the system's capabilities, the results being a testimony to the collective quality of those components. But it does represent a bit of a reviewing conundrum: does one fill the house with other so called 'reference' amps, hire an orchestra, a Nagra and the best mic(s) around (Calrec Soundfield perhaps) and do a serious live versus recorded comparison, or just listen to as many great albums as

subjectively flat, yet bass notes take on such incredible articulation and power that other amps sound as though they've rolled off and spongy. And this is with the *JlIs*. Dragging the amp down to the Ed's basement and hooking it up to the new Townshend *Sir Galahad* loudspeakers, proved that it is indeed a valve amp with a fully extended and very high clarity bottom end.

In most respects the *Ongaku* is as close to not having an amplifier as you can get - it just doesn't seem to have a sound. A friend who's pretty well entangled in this business and doesn't particularly like valve amps, accusing them of poor definition and coloration, was surprised that I, a tube junky, liked the *Ongaku*. Its incredible definition and dynamics reminded him of the sort of sounds he says can be created with good transistor amps. In some respects, he's right: it

combines the ruthless definition and power of transistors with the effortless transparency and dynamics of tubes - it's pretty well all things to all owners of reasonably efficient loudspeakers.

The comments above relate to vinyl. The *Ongaku*, however, was designed to be used with CD players, the onboard line preamp with its apparently airbearing'd volume pot making it the perfect partner for a first class disc player. It certainly made a very fine job of revealing the remarkable output of a Micromega *Trio*, resolving that machine's awesome separation and power with considerable panache.

If the *Ongaku* were a little more powerful, it would be the ultimate reviewing tool, if not the ultimate amplifier. It's not that limited in application, but speakers that are less efficient than 86dB or whose impedances

physically possible? Guess which option I went for.

Is there anything wrong with the *Ongaku*? Yes, it costs too much for a piece of hi-fi equipment, it weighs too much and it puts out too much heat to be used in a poorly ventilated room in the early days of August '90 (remember the 'Phew what a scorcher' headlines?). Oh, and it won't drive a few purportedly high-end speakers. But otherwise, it's probably the best amplifier in the world. And I'm not letting it go without a fight!

Jason Kennedy

GENERAL DATA

Dimensions (h x w x d):	22 x 24 x 52mm
Power output:	27watts
Type:	Triode valve
Inputs:	6
Primary impedance:	16Kohm
Price:	£29,950

Doug Brady Hi-Fi

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Preamplifier

Audio Research *LS1*

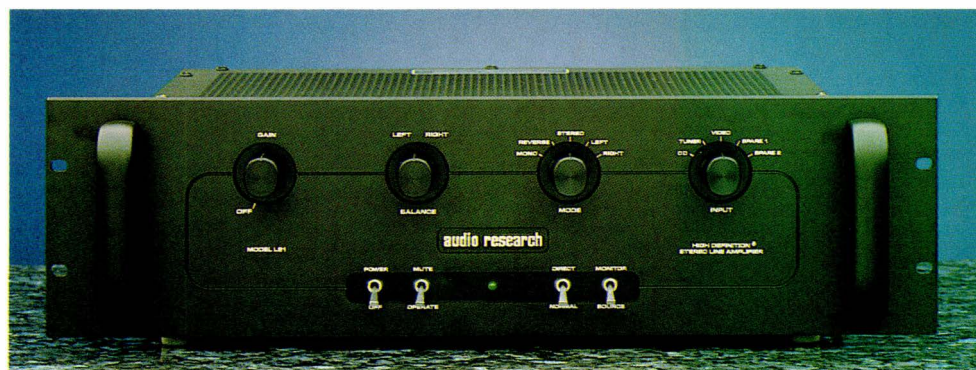
Absolute Sounds Ltd., 58 Durham Road, London SW20 0DE. Tel: (081) 947 5047

Well known for its expensive pre and power amplifiers, Audio Research has taken the unusual step of releasing a modestly priced preamp/control unit whose performance reaches true audiophile heights. Lest we get excited about this, let us bear in mind that it offers line input facilities only, foregoing any analogue disc input save those which have been pre-conditioned and equalised in an auxiliary unit such as the Roksan or an accessory preamplifier. In addition, certain combinations of high output/low impedance CD players and higher gain power amplifiers do not need a line preamp at all - a simple 10K or 20K volume control can often provide the best results of all.

In the real world, preamplifiers earn their living by properly matching a variety of sound sources to a variety of possible power amplifiers and cables, helping to minimise noise, interface and system interactions. Additionally, dubbing circuits allow for convenient source selection for tape recording.

Built in classic, clean Audio Research style, the whole is well proportioned and sensibly laid out and legended. Of the input facilities, CD direct is primarily designed for the most direct path to afford maximum transparency and definition. Additional labelled inputs include CD (normal), Aux 1, Aux 2, video and tuner. CD (normal) offers some input attenuation to improve the operating range of the volume control which is often pushed well back with such high level sources. Paralleled audio outputs are provided (unbalanced only) which may aid bi-amping for those partial to the technique.

Neatly constructed in a single box, the power supply includes a toroidal mains transformer followed by the company's own high performance regulator circuits of low noise and excellent stability - a fundamental requirement for the single ended (as opposed to push-pull or balanced techniques) amplifier circuits used. The latter employ Acoustic Research's current hybrid technology, a combination of FET (solid state) and valve (vacuum tube) elements in high linearity/low noise circuit using full loop feedback.



This line stage is phase correct and uses specially selected top quality components including some WonderCap polypropylenes.

Lab Report

Specifications and basic test data are provided in the accompanying test panel. Checks were made to confirm the unit's basic performance and technical accuracy. Distortion was negligible under all conditions while the output proved to be powerful with a moderate source impedance suited to most power amplifiers. The responses were well extended at low frequencies and were substantially flat, as they should be. Surprisingly, stereo separation was mediocre, falling to a maximum of 22dB via CD at 20kHz, although this did not seem to have upset the results. The terminating impedance varied between the various inputs but all the values were satisfactorily high. Volume tracking was excellent and the hum levels, both electrical and mechanical, were low.

Sound Quality

Early impressions were of a first rate performance which did not pale over an extended listening period. The *LS1* could be compared directly with some of the finest references at much higher prices.

Stereo images were well structured with near-excellent stage width and depth. A broad effect was also maintained to the back of the perceived sound stage. Specific focus was extremely fine. Showing considerable transparency, this control unit effortlessly revealed a high proportion of the ambience, air and atmosphere present in good recordings. Complementary to CD in neutrality, the

LS1 contributed a delicious midrange capable of accurately rendering subtle harmonic shading and 'singing' well on both piano and vocal material.

Treble sounds were very clean, if a little on the bright side, yet held well below the point where the fine rendition of perspective might be disturbed. Bass proved to be deep and powerful with convincing slam and no shortfall on rhythm and pace - an unusual combination of virtues in an audiophile product. In normal mode, there was a mild loss of definition and depth, in return for the use of the standard selectors and the channel balance facility.

Conclusion

At a price of £1,575, this line control product delivered virtually the same performance as top rated preamplifiers from Audio Research and other worthy competitors in the higher price range. In my view, its combination of transparency, neutrality, precise sound staging and pace is hard to beat, and it assures the *LS1* of a firm recommendation. Rock and classical fans alike will be pleased by its balanced performance.

Martin Colloms

TEST RESULTS

Output: max 53v from 240ohms, unbalanced only
Phase: absolute phase correct
Frequency response: within +0, -0.25dB 8Hz to 20kHz
Distortion: harmonic, better than 0.01%, -80dB
intermodulation, better than 0.005%, -86dB
Noise: typically -100dB CCIR ARM for CD input levels
Channel balance: typically +/- 0.2dB
Channel separation: typically 60dB, worst case 22dB
at 20kHz via attenuated CD input
Sensitivities: line / AUX / CD direct, 46mV / (for 0.5v
output) CD (normal) 148mV
Dimensions (w x h x d): 48.2 x 13.7 x 30cm
Price: £1,575

Basis Debut Gold Standard

Basis Audio Manufacturing, 47 Green Heron Lane, Nashua, New Hampshire, 03062 USA. Tel: 603 888 6017

In the heady area of high-end turntables, one name has reigned supreme for years: The Goldmund *Reference*. But a couple of serious challengers have been crowding the £20,000 limited-edition masterpiece, and new ones continue to emerge. Rivals include the forthcoming SME and the now-on-hold Versa Dynamics. One rival is the Basis *Debut Gold Standard*.

Conceptually, the Basis has more in common with the SME than any of the other contenders. Both employ suspended sub-chassis and belt-drive as well as high-mass construction. Additionally, both employ four-point rather than three-point suspensions, which can better deal with resonances through more accurate, controllable tuning in a system which can be coupled more easily to the deadening properties of high mass materials. To achieve the superior isolation of a floating suspension, coupled to a resonance-free structure of high mass, the Basis' designer, AJ Conti, opted for a hanging suspension employing fluid-damped coil springs. The suspended assembly weighs over 50lb.

Loaded with lead

The Basis consists of a main chassis measuring 23 x 16in (W x D), with a 7in tall pillar at each corner. The main chassis consists of a slab of methacrylate, as does the slightly smaller but identically shaped subchassis board, the arm board and the platter. The armboard and platter are loaded with lead ingots, the lead being used to balance the platter when matched to the main bearing. The Basis is supplied with the subchassis board 'pre-mounted', with each corner in a slot in the corresponding pillar; two transit bolts hold it in place during shipping. The main chassis contains the controls (on/off, 45/33 and fine speed adjust) and a Papst CD Hall-effect motor. Power comes from an outboard, Krell-designed supply.

The subchassis holds, in the centre of a platter-sized recess, a captive bearing sealed to prevent others from discovering its proprietary details. What can be revealed is that it employs a shaft of

ground and polished stainless steel, held vertically by two bushings made from a lead/Teflon composite. The bearing tip rests on a ball which rests on a sphere-supported thrust pad made from a proprietary hardened-and-sintered metallic material.

The depth of the bearing and the dimensions and weight of the platter place the platter's centre of gravity below the bearing's top bushing. Each platter is matched to each bearing by the aforementioned lead ingots which are visible from the platter's underside.

Although setting up the Basis *Debut Gold Standard* can be awkward due to the weights involved, the design and assembly procedure will allow any hi-fi enthusiast to have a Basis up and running in under an hour.

The first stage involves placing the chassis/subchassis assembly on a work surface with one pillar hanging over the edge for access from below. Unscrewing the adjustable foot at the bottom readies the pillar to accept a cylinder containing the spring and silicon fluid. It is situated up through the bottom and grasped with a t-bar which has an internal thread to mate to a long screw which protrudes from the top of the cylinder. This is pulled up through the top of the pillar, at which point two holes are exposed on either side of the cylinder. These accept two short rods which locate and support the cylinder in the corner pillar. These are aligned to rest into slots in the pillars, after which the piston/cylinder is released. The t-bar is then unscrewed and the procedure is repeated for each pillar.

After each pillar has been fitted with a cylinder, the feet are replaced and the turntable is moved to where it will reside permanently. On top of each pillar, a cap is fitted which also serves as the control knob for adjusting/levelling the suspension after the belt, platter and arm are fitted. The platter is fitted over the spindle, aligned to match a point indicated on the bearing housing and the platter's underside. The flat belt is positioned around the pulley and the outer edge of

the platter, and a triangular dust cover is supplied for aesthetic purposes and to keep out dust and debris. Speed changing is accomplished via the switches at the side of the plinth.

Three point contact

The arm board is a massive slab of lead and acrylic fitted with three tiny 'feet'. It fits into a slot on the main chassis and the precision fit and 8lb mass mean that no further fixing is required. This assembly makes contact to the turntable only via the three points on its underside.

Because of the easy mounting, arms can be swapped in minutes. The arm lead



exits the deck in the gap between the main and subchassis. The suspension is then levelled by turning the caps and observing the relative position of the sub-chassis to the top/bottom of the slot in each pillar. Because of the masses involved, changing arms with a weight difference of up to 2lb will not upset the level of the deck by more than 1 degree. The Basis is supplied with a finely-machined screw-down clamp to mate an LP to the 'matless' platter; experimenting with heavier pucks won't require chassis re-adjustment either.

The four-point suspension is also self-centering. The only ergonomic/installation failing is the lack of an earthing screw which may affect certain tonearms and/or cartridges; Deccas can be tricky to install in this player.

Aesthetics are imposing, the Basis *Debut Gold Standard* being one regal, massive black slab with gold trim. Unfortunately, the black gloss finish, as seen on speakers like the Wilson *WATTS*, certain Cantons and JBLs and others, attracts dust and fingerprints as well as microscopic scratches. Unfortunately, a dust cover is not yet available; owners are advised to invest in a soft cover such as those for computer printers.

Sound Quality

A number of turntables faced off with the Basis during the review period, including

a complete Roksan front-end, the Oracle and a pre-production sample of the SME. Not that the panel needed convincing, this array of decks revealed that turntables have a 'sound' which is as easily discerned as that of any other component. And while all are stellar performers, the Basis wears its authority like a banner. From the top of the frequency range to its lowest depths, the Basis is a more commanding performer than its rivals. But systems matching, as ever, could render some decks more suitable than others for certain applications.

The primary gain experienced by installing a Basis into the reference system of Audio Research *SP-14*, Lumley *150* monoblocks and Apogee *Stages* and *Divas* was the more convincing handling of the lower registers and all that that implies. It explains why the name 'Basis' is so apt. The most immediate sign is an increase in bass extension, evident on recordings such as the 12in single version of Willy DeVille's *Assassin Of Love* and the Human League's *Don't You Want Me*. To this was added control and clarity, which enabled the Basis to unravel complex lower-register passages with a facility not even suggested by the other players.

By-products of superlative bass capability, as evinced by the Basis, included more fluid rhythmic patterns, more accurate pace and a sense of solidity

which in turn makes the sounds more palpable. If anything, the Basis made the other players seem somewhat 'lightweight', although we are reserving our judgement of the SME *Series 30* until a production version is made available.

The mid and upper regions share this sense of control and solidity, especially in the areas of transient attack, accurate decay, imaging, soundstage re-assembly and other areas affected by precise operation rather than tonal flavouring (or the lack thereof). Silences, either between tracks, during short breaks in a performance, or in 'the spaces' surrounding instruments were almost funereal, reminding one panelist of the Townshend *Rock*. In some respects, the Basis was felt to emulate CD's better traits, but most felt that the player merely restated the LP's superiority.

Also unmatched was the heightened portrayal of very fine detail, especially sounds masked during passages with widely varying dynamic contrasts. Noted and with consistent repetition were sounds in the orchestra and audience such as feet scraping or pages rustling, while one listener noted, on a studio recording produced in London with ample high level electric bass guitar and drums, the low level, low frequency sound of a tube train passing by.

Conclusion

Assessing the worth of a product relative to its competition is difficult, but more so when the price is not known. This should make things easier and somehow more 'pure', as the product is then being rated solely for its performance. But in the high-end, price differences of even thousands of pounds won't affect certain lucky customers with deep pockets. In other words, if one can afford a Goldmund, one can afford an SME. If one can afford an SME, then one can afford a Basis. We're assuming that the Basis will sell for around £6,000, a hideously high price to pay for a turntable, but a bargain relative to most of its competitors - save for the *Rock Reference* and *Voyd Reference* decks. No, we can't call the Basis *Debut Gold Standard* a 'Best Buy', but we can recommend it without reservation to anyone interested in purchasing a final turntable to see the LP out in style.

Stop Press

It is likely that Basis will be distributed by Reference Imports (see Directory, page 151). The company suggests that the UK price of the *Debut Gold Standard* will be £5,995.

The Hi-Fi Choice Panel

The Basis Debut Gold Standard - restating vinyl superiority.



Power Amplifier

Carver Silver Seven

HW International, 3-5 Eden Grove, London N7 8EQ. Tel: (071) 607 2717

Carver's *Silver Seven* Mono Vacuum Tube Power Amplifier is described by the company as a classic circuit benefiting from modern developments. It's a recipe which applies to most new tube amplifiers, simply because there haven't been many new tubes developed during the past 25 years which could be exploited by amp designers in radical circuits.

More to the point, the Carver *Silver Seven* is designer Bob Carver's answer to challenges from America's high-end press. Carver is best known for a line of mid-level solid-state electronics, which the man promotes as high-end and which is sonically identical to products costing many times more. When American hi-fi journalists called his bluff, Bob Carver responded with this cost-no-object product, an over-engineered marvel with a price-tag to match.

The *Silver Seven* consists of four chassis, two mono power amps and two power supplies connected by multi-core umbilical cords. Each black lacquered chassis rests on four rubbery Simms Vibration Dampers, which are first situated on polished granite anti-vibration bases - this should eliminate any mechanical interference which might cause microphony. Each power supply chassis, measuring 252 x 452 x 245mm (w x d x h) including the feet and baseplate, features a large needle-type meter on its front panel. The meter monitors tube condition.

At the back are the fuses, the mains and umbilical leads and the on/off and stand-by switches. This is something of an inconvenience as users are unlikely to leave the *Silver Seven* on at all times because of the heat they generate and the way they devour electricity. Having the switches on the front would be preferable. The meter does nothing until something goes wrong, but it does monitor the health of the very costly valves. Accusations that this 'retro' touch is a mere styling fillip should be ignored.

Switch-on from cold takes three or four minutes until the 'soft start' relays click. Once underway, the user can switch the unit back into stand-by. Switching back on takes about one minute as the amp has been 'idling' to keep it primed.

Each 330 x 485 x 275mm (w x d x h) main chassis sports fourteen 6550 output tubes, plus a 6550 as a voltage regulator; KT88s are an added-cost optional extra. (It is believed by many audiophiles that the 6550 is the more reliable of the two valves.) A 12BY7 high-gain voltage amplifier pentode serves as the input valve and three paralleled 12BH7A power triodes drive the 6550s.

A tiny bar protects the four input valves

to exercise caution.

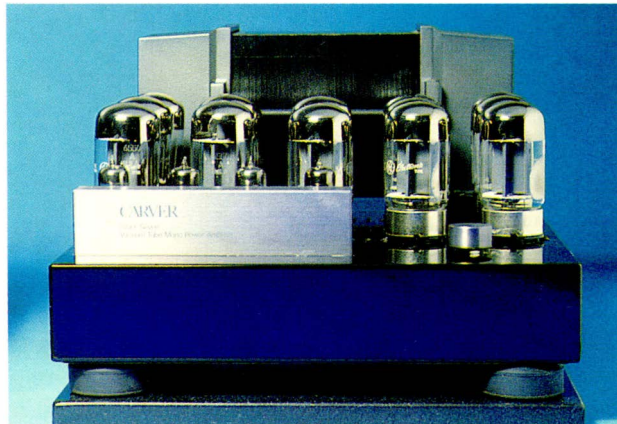
The '*Seven*' features automatic biasing, supplemented by a bias switch on the back which is employed when the valves have aged and the meter shows an idling current moving above 0.6 amps. Switch to 'high bias' and the life of the tubes can be extended, with the plate current falling back to between 0.2 and 0.6 amps.

The *Silver Seven's* speaker terminal arrangement consists of an array of screw fixings offering a choice of 1, 2-4 or 8ohm matching. Five-way binding posts would be a better choice in situations where bi-wiring will be employed because the screw terminals are inadequate for gripping the doubled-up leads or spade lugs.

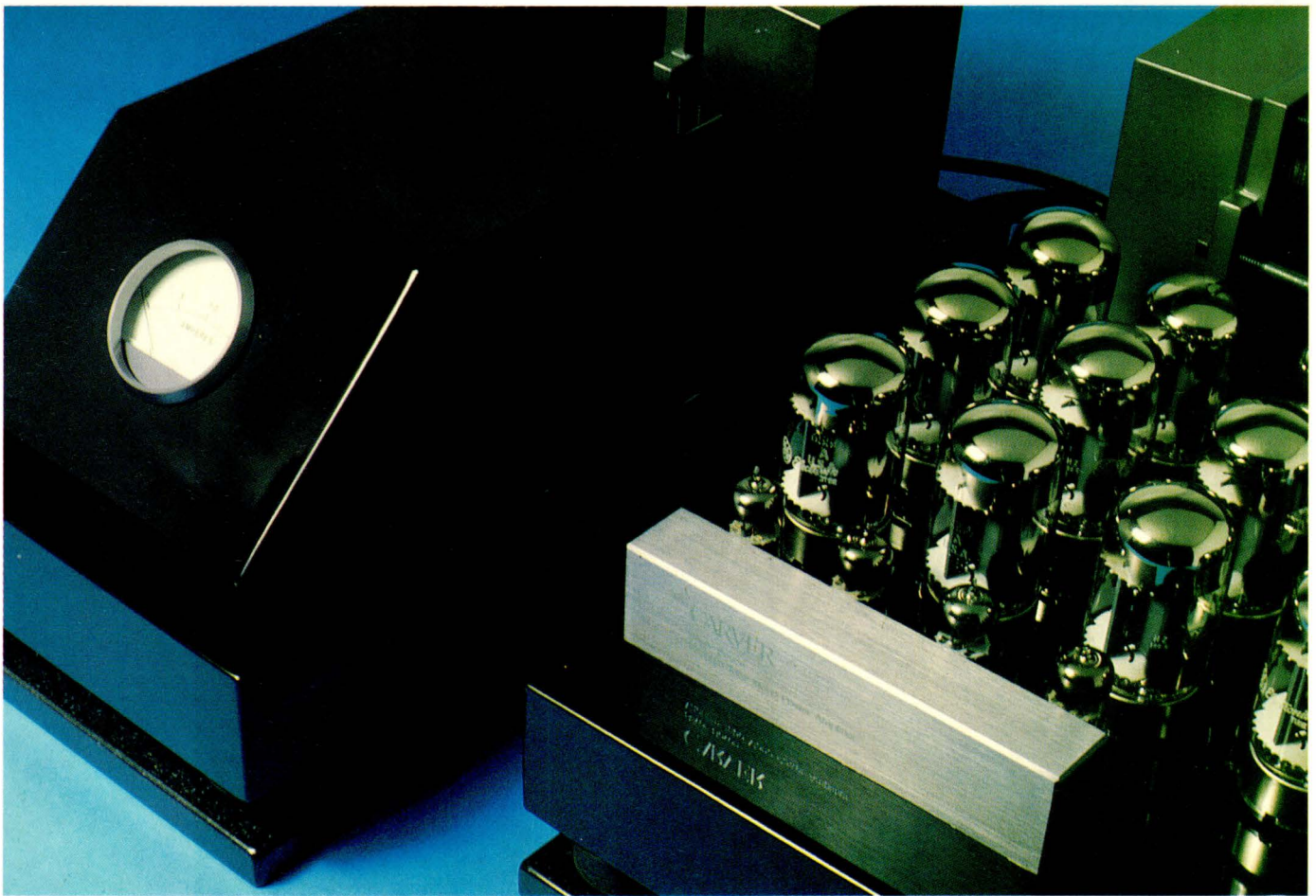
This amplifier derives its name from the use of silver wiring, silver solder and seven pairs of output tubes. The circuit employs traditional fully-balanced topology, massive wide bandwidth ultralinear output transformers and hand-picked valves. The 14 tubes per side produce a conservative 375W into 8ohms, with peak current on the 1ohm tap of 35 amps; energy storage is 390 joules. Carver doesn't deny that there are traces of the vintage sound in the *Silver Seven*, but this cherished quality

is tempered and updated by the absence of noise, the ability to drive modern, difficult loads and bandwidth, power and dynamics not available from products produced during the original valve era.

A variety of speakers were used with the Carvers to test the units' flexibility with differing loads. The list included the Wilson WATTS, Apogee *Divas* and *Stages*, as well as Celestion *SL700s* as the 'difficult' loads, while speakers from Monitor Audio, Acoustat, Tannoy and KEF were employed for their more sensible impedances. Sources included a Basis/SME/Koetsu *Urushi* analogue front-end and the Marantz *CD12*, Proceed and CAL *Tempest II Signature* CD players. Preamps consisted of the Audio Research *SP-14*, Mod Squad's passive *Line Drive* and



at the very front, essential as there are no covers supplied and it's likely that these huge chassis will be sited on the floor. To the right of the smaller valves is a gain control; the mains transformers sit at the back. Beneath these and at the rear are two gold-plated input sockets, one for all types of preamp and one for preamps guaranteed not to leak DC. The latter input is labelled 'Lab Direct' and is DC-coupled to the amplifier, while the 'Normal' input is AC coupled through a WonderCap. Although there are subtle gains to be acquired when using the 'Lab Direct' input, there are horrendous costs should the matching preamp leak DC. Considering the price of this amplifier and the likely price of speakers which would be matched to it, users are advised



Carver's C-19 valve preamp; the last-named is the predecessor to the forthcoming high-end tube preamp which will be a better match for the *Silver Seven*.

It's difficult to ignore the price of the *Silver Seven*, even in the context of *The Collection*, which is brimming with costly components. But £17,500 is as close to the top of the tree as you can get, and for that money, the product should be something special. And however well-made and stylish the *Silver Seven* may be, there are other ways to spend that sum if all you want is a piece of sculpture.

But it would be a mistake to think that this is just another example of Bob Carver's undeniable showmanship. The *Silver Seven* - regardless of the speaker it was driving - proved to be equal, or audibly superior, to any amplifiers in the review panel's experience.

Sound Quality

Although the 'classic' sound is evident at all times, the *Silver Seven* adds lower registers beyond the capability of any vintage valve amplifier. For those torn between tubes and transistors, the *Silver Seven* manages to 'ape' the best of the modern behemoths - Krells, Levinsons, Rowlands and the like - but it also possesses a richness missing in most solid-state designs.

Listeners well-versed in the behaviour of all-valve (as opposed to hybrid) amplifiers will be surprised by the control,

Torn between tube or solid-state? The Silver Seven could be the perfect solution . . .

a characteristic which stays with the sound up through the midband. The lower and lower-mid richness graduates to neutrality, settling in with crystal-clear upper-mid and treble regions. The result is a superior amalgam of the vintage and the modern, with both warmth and 'romance' (tube traits) plus accuracy and detail (modern traits) providing this amplifier with a unique and appealing balance of desirable traits. Its fast transients worthy of high-end solid-state designs, plus the sweetness of tube products, makes it a perfect solution for the audiophile torn between the two camps of tube and solid-state. And it does this better than any hybrid employing, typically, MOSFETs in the output section.

In spatial terms, the Carver displays precision and seamlessness available from some other high-end designs, so the company hasn't demonstrated any radical gains in terms of 'stagecraft'; neither does it disappoint. There's a 'rightness' to the portrayal of the recording venue, which - allied to the lifelike midband - makes this a perfect choice for those who listen to recordings of acoustic instruments recorded with purist techniques.

Where the *Silver Seven* reveals limitations is in terms of sheer oomph, despite the power rating. This amplifier does not behave like the beast the power

ratings may suggest, and this must be taken into consideration if the potential owner intends to mate the Carver with exceptionally hungry or awkward speakers. While it drove the various Apogeos to satisfying levels in a 7 x 7.5m room, it would not 'shake the rafters'. It is assumed, however, that anyone purchasing at this price level would be able to insist on a home demonstration to better gauge its suitability for the task.

Conclusion

The lack of seemingly limitless power doesn't prevent the *Silver Seven* from earning the accolade of 'one of the very finest amplifiers money can buy'. The *Silver Seven* is as much a statement as it is a real-world product, more so when you consider its price. Carver recognises this, too, and is content to use it as a selling point or marketing tool; the 50-plus sets which have reached end-users probably made no profit for the company other than in terms of prestige.

The tragedy is that so many would appreciate the virtues of the *Silver Seven*, but few can afford it. *Hi-Fi Choice* has learned that a less costly variant, the *Silver Six* will follow later. Despite whatever reservations one may have about hi-fi costing five figures, (in this case, £17,500), the *Silver Seven* comes highly recommended.

The Hi Fi Choice Panel

Amplifier

Classé DR-5/DR-8

Absolute Sounds Ltd., 58 Durham Road, London
SW20 0DE. Tel: (081) 947 5047

Krell has led the pack - the big'n'beefy amplifier brigade - for so long that things were getting too predictable. Whether or not Krell welcomes or needs some real competition is neither here nor there, because competition has appeared . . . and from Canada, no less. Classé has, in a seemingly short time, emerged as a genuine and highly desirable alternative to Krell, but with the added appeal of lower prices and slightly less in the way of snob value.

The DR-8 amplifier has that standard, black-front-and-handles, professional look. The Classé says 'no nonsense', with just the script and the on/off switch to identify it. At the back are fittings including a choice of balanced (XLR) or single-ended (phono-style) inputs, toggle switches to select stereo or mono operation and a three-pin IEC connector for the mains lead. Most prominent amongst the rear-panel hardware are the speaker terminals: massive bolts rather than screw tag strips or conventional binding posts. These require the use of a 7/16th inch spanner as supplied by Classé, and they will satisfy any user convinced that high-torque connections are *de rigueur*. The terminals accept bare wire or spade lugs with all the force you can muster.

To select between balanced and unbalanced operation, the lid must be removed to access internal adjustments. The internal construction belies the prosaic exterior, hiding as it does 'designer' components, superb workmanship and a profusion of heat sinks. The Classé DR-8 runs cool regardless of the speaker load; this plus the bomb-proof assembly suggest the reliability demanded of costly hardware. The Classé amplifier measures 482 x 380 x 180mm (w x d x h).

The DR-8 is a high current/high voltage design, based on the top-of-the-line DR-9. Although rated at 70W/channel, the DR-8 behaves like the 200W/channel-rated

Aragons and the 150W Lumley monobloks used for comparisons. The two channels share only the mains input and the primaries of the massive power transformer, each channel's power supply separately rectified and filtered by proprietary capacitors rated for 80,000uF in total. Classé suggests that the output section's power transistor capability is 2kW or 128 amps per channel. Safety is dealt with via a single mains fuse and a DC protection circuit.

The DR-5 preamp as well shares that wholly-functional, no-nonsense look. Also graced with handles, the fascia contains four rotary controls offering (from left to right) input selector, mode, balance and volume. The first selects between phono and four line inputs, three identical (CD and two auxiliaries) with 'tuner' padded down by 6dB to accommodate a tuner's typically higher output. The mode selector provides stereo, reverse, mono and L-only or R-only. Balance features a centre-detent, while the volume control operates in 32 'steps'.

Four toggle switches choose between tape/source, phono/bypass (for direct feed of the phono signal past the input selector, tape and mode switches), polarity inversion and mute, the latter a necessity as there is no 'mains-off' switch. Classé has noted correctly that the DR-5 sounds best only after full warm-up; from brand-new, it took four days for 'burn-in'; after the initial running-in period, users can expect warm-up to take 2-3 hours after switch-on for the '5 to sound its best.

The back features a row of gold-plated sockets plus a selector to choose between MM and MC operation. Loading is accomplished automatically through the use of self-adjusting impedance circuits, while MC gain is user selectable. Classé supplies a selection of resistors to allow the user to vary the factory setting of 24dB gain (in addition to the MM gain of 35dB)



in 2dB steps; the range is 20dB-40dB, allowing for a majority of cartridges bar exceptionally low-output types such as certain Audio Notes and Ortofons. The resistors 'press-fit' into gold-plated sockets inside the preamp; silver solder is supplied for users preferring a permanent fixing. The DR-5 also features an IEC mains lead input and the choice of balanced or single-ended operation.

The Classé devices were auditioned alongside the Audio Research SP-14 and Gryphon preamps and Aragon 4004 and Lumley 150 power amps. Also used in the review system were the Basis/SME V/Koetsu *Urushi* analogue sources, along with the CAL *Tempest II SE* and Marantz CD-12 CD players, Apogee *Divas* and *Stages* in bi-wire mode, Celestion SL700s, Acoustat *Spectra 11s*, Wilson WATTs and Sonus Faber *Electa Amators*.

Sound Quality

The DR-8 power amp is very much of a particular 'school' or type in that it is neither beast nor wimp. Some high-end juggernauts are all oomph! and little



delicacy, while others are all sound quality and devoid of guts. The Classé can deliver both force and finesse, a clever juggling act when you think about it - sort of like finding out that Arnold Schwarzenegger writes sonnets.

It's a matter of 'rising to the occasion'. The generous power supplies, the overkill construction and the no-compromise parts specification enable the Classé to coast or charge, depending on the music. But it does have its limitations.

While the midband and treble performance are on a par with the class leaders, the bass lacks the presence of the bottom octaves as portrayed by Krell. At times, the DR-8 sounds lazy, almost laid-back - which is not the same as saying that it's running out of steam. The phenomenon has also been noticed in certain Rowland designs, too, so it's not an unfamiliar experience. What it does demand of the user, though, are speakers which do not depend on the amplifier to tighten their sound. This can be approached either with speakers which don't plumb the depths - the DR-8 is, for

example, a delight with the Wilson WATTs - or by using speakers which are intrinsically well- or over-damped.

Instead, one should consider the DR-8 if transparency and midband accuracy are over-riding concerns. The middle region is open-sounding and natural, rivalling some legendary tube designs, while the treble is as sweet as you'd expect of a solid-state amplifier cured of transistoritis. What it does that few manageable tube amplifiers will do is drive all kinds of loads without ever showing any strain, including sundry Apogees, the WATTs and the SL700s. At its price, it could shake up the competition - including like-priced native gear.

The DR-5, however, is the stronger of the two products, though the DR-8 is more than worthy if you can overlook the reservations about the bottom octaves. The DR-5, first and foremost, will win friends because (despite the prosaic styling) it is not a hairshirt device. Everything that's required for controlling a complex installation is there, not the least being the balanced operation,

Class act: force, finesse and no-nonsense.

cartridge matching and polarity inversion. And the prosaic styling, or 'semi-pro' layout also makes operation virtually instinctive; this preamplifier is 'sensible' in the most positive way.

Like the DR-8, it is transparent enough to serve in systems where you'd expect a preamp costing twice as much to be serving time. The line stages (and the DR-5 has recently been made available in line-level-only form) are such clean 'conduits' that they'll fool users of passive preamps into thinking that the active stages can be by-passed.

The phono section, though, makes the DR-5 truly special, holding its own against the dearer preamps used for comparison purposes. While the Gryphon (reviewed on page 73) offered slightly finer detail and a greater sense of precision and the Audio Research SP-14 provided a touch of welcome warmth and 'musicality', the DR-5 nestled nicely in-between. The DR-5 matched both preamps in the crucial lower midband/upper bass region, thus providing a fine sense of rhythm and pace; this also enabled the DR-8 to perform of its best. What makes the DR-5 special is its ability to extract the most of a given cartridge, and users are advised to experiment with the fine-tuning.

Conclusion

To avoid colouring your perceptions, the prices have been left until the end of this report. It is hoped that you read the review in the context reserved for units costing £3,000-£5,000, which is where the Classés belong. The reality, though, is that the DR-5 costs £2,050 and the DR-8 £2,591. No, they are not budget products. Neither are they priced at the upper reaches of today's more exotic offerings. What Classé has done is lower the entrance fee for those who wish to join the State Of The Art Club. If you can dispense with the luxurious look and feel of Gryphon, Krell, Jadis and the like, or if you can tolerate slight compromises in the lower registers, the Classé pairing may be the best hi-fi investment you can make.

The Hi-Fi Choice Panel

Conrad-Johnson *PF1/MF200*

Audiodreams, 15 Linkway, Ham, Surrey TW10 7QT.
Tel: (081) 948 4153

Arguments will always rage about which electronics are the best to use in the design of preamplifiers and power amplifiers. Valve, bi-polar and FET - or some other combination - all find favour somewhere. Yet in my experience it really doesn't seem to matter which technology is employed if it's employed well. Ultimately, one technology may provide the best answer, but thus far the state of the art hasn't yet been developed to a point where this is revealed. This means that with any power amplifier, no preconceptions can be made as to how it's going to perform. Don't be seduced by technical claims - most amplifiers these days are technically competent - so choose the one which will deliver the performance you require, not the technology someone else says you need.

Many designers who like valves often use FETs, which can have similar attributes and lend themselves to similar circuit design when for one reason or another valves are inappropriate. This Conrad-Johnson pre/power amplifier combination uses all FET stages and, in the classic C-J tradition, overall feedback is a term deleted from the design books.

PF1 FET preamplifier

While decidedly 'audiophile' in execution, the *PF1* is not without a fair share of facilities - including a tape monitor control which handles two tape recorders, an 11-position balance control and a right/left/stereo/mono/reverse switch. A rotary selector switch chooses between phono, tuner, CD, tape 1 and tape 2 inputs.

There is no on/off switch. Power consumption is so low, however, that it shouldn't put up your electricity bill even

if you do leave it permanently powered. Internally the *PF1* is interesting - all FETs, yes, but also there are no electrolytic capacitors anywhere. Instead, a small transformer feeds a large (but not large in electrolytic terms) polypropylene capacitor. All the components are fitted onto one large printed circuit board which leads to a minimum of wiring. Build quality is workmanlike. Simple zener transistor regulators are used for each stage. A simple single-ended FET input is followed by a passive RIAA filter, which in turn is followed by buffer and gain stages. From here it goes to the tape outputs or the volume control and on to a final buffer line stage. All the stages are capacitor-coupled by 2 x 0.5uF polystyrene capacitors with good quality polypropylene capacitors used for decoupling.

Sound Quality

Sometimes a product appears which upsets the status quo somewhat, and this is one such product. It really is exceptional. I have heard many of the world's highly rated preamplifiers and, while the *PF1* is far cheaper than most of these, as a phono amplifier it stands comparison with the finest in the world - irrespective of price. At £1,350, this product represents fine value for money in terms of sound quality - especially for vinyl lovers. I used several cartridges, including a vanden Hul *MC10*, a Linn *Troika*, and a Koetsu *Red Signature*. The *Troika* was a little low on output to be an ideal match and the preamp really runs out of gain; however, with moving coil cartridges with reasonable output (and moving magnets, of course) there should really be no trouble. On our review

sample the line stage seemed to have too much hiss. The importer has checked this out and although he was unable to supply a replacement model to prove the point, he assures me that this is abnormal. Still, I reckon it's worth checking that the hiss level is low enough to satisfy your needs.

Starting with the treble, it's low in grain, detailed and transparent, the midrange likewise, and the bass quick and agile. The *PF1* probably sounds a bit lightweight in comparison with some of its peers, but I liked it for its speed and agility. What was striking about the preamplifier - apart from its ability to create space, focus, depth, transparency and all the usual things you would expect from an American preamp of this type - was the fact that it was coherent in the time domain. This preamp was definitely upbeat, and intensely interesting in musical terms. With the *PF1* the band plays together and the whole bounces along nicely. The sound stage has excellent depth - some of the best depth I have come across.

The line amplifier is not the best, which means that the phono stage must be something rather special. In comparison with a quality potentiometer driven from a Meridian *203*, I found the line inputs just a little lacking in some areas. There was some apparent tonal alteration and loss of ambience. It sounded just a little veiled and 'shut in' in comparison with 'no preamp' (ie, levels matched by resistor network).

It doesn't really add any analogue warmth, is basically neutral, and while some listeners might consider it just a little too laid back, for me it's just right. On disc the *PF1* pulls things together like no other preamp at this price. It just makes music and forces you back to analogue from digital. It shows what's wrong with digital in no uncertain terms!

MF200 power amplifier

For an imported American stereo power amplifier with a good pedigree delivering over 200W/channel - and maintaining this level into four ohms - £2,150 is not a hefty price to pay. Equivalent British amplifiers tend to cost equivalent sums, so in the States this must be an almost 'budget' model in the high-end arena.

The *MF200* is styled to match the *PF1* preamplifier's gold anodised front panel



and black steel case. At the back there are some substantial vertical finned black anodised alloy heat sinks. These are not of the Krell type - they are smaller and less obtrusive. They get fairly warm in service, but not too much for comfort. Socketry is minimal, using gold plated phono inputs and 5-way binding post outputs, all of which are good quality.

The amplifier circuitry is entirely FET. Hitachi MOSFET output stages with three pairs of complementary FETs per channel should enable reasonable current capability and hence power delivery into all but the most difficult loads. Loudspeaker protection is provided by supply line fuses.

The power supply is shared between the channels. A large laminated core transformer is located centrally and near the front of the amplifier. Behind this are two large 59000uF 75V electrolytic capacitors which are mounted straight onto a printed circuit board which also carries regulators for the input stages. The power amplifier active circuitry is double mono, built on vertically mounted printed circuit boards on either side of the supply. The circuitry used is fairly straightforward and, as mentioned earlier, there is no overall feedback. Good parts are used throughout with polypropylene capacitors employed for decoupling.

Sound Quality

The performance of this amplifier compared to other power amplifiers does

Another string to the C-J bow: this combination is worth shortlisting.

not match that of the PF1 preamp when compared to its rivals. This came as no great surprise, for if it were so the combination would have been all-conquering. So - I have heard better, but make no mistake, it would be difficult to find many amplifiers which are comparable when price is taken into account.

It boogies fairly well and always sounds coherent. Perhaps more at home on classical music when not driven too hard, the MF200 tends to get harsher as the volume and the strain on the amplifier increases. It is basically transparent, far more so than the vast majority of power amplifiers available, especially at low power levels, and more transparent than all but a small handful of the competitors capable of high power delivery. However, in comparison with the very best, I find it just a little veiled, losing the nth degree of finesse.

The balance is neutral at low volume levels, and it produces a good sound stage with plenty of depth. Although images are created well in space, they are just a little fuzzy around the edges. It's not high definition in the way some amplifiers etch the images definitely and sharply. The bass is a bit soft, lacks some articulation from the source, but it's never sour or hyped. The midrange is tonally pure and considerably well balanced, but it doesn't

quite have the detail found in the very best power amplifiers.

Conclusion

Together these pre and power amplifiers combine to produce a very competitive association. On its own, the power amplifier has considerable strengths, but I don't feel that it's quite complete enough to gain an altogether unreserved recommendation. Nevertheless, I'm pushed to find a comparable amplifier to recommend in this market sector and hence would propose you include it on your shortlist. Meanwhile the preamplifier offers vinyl magic, at an affordable price. It satisfies my phono preamplifier needs and as such must be strongly recommended.

Chris Bryant

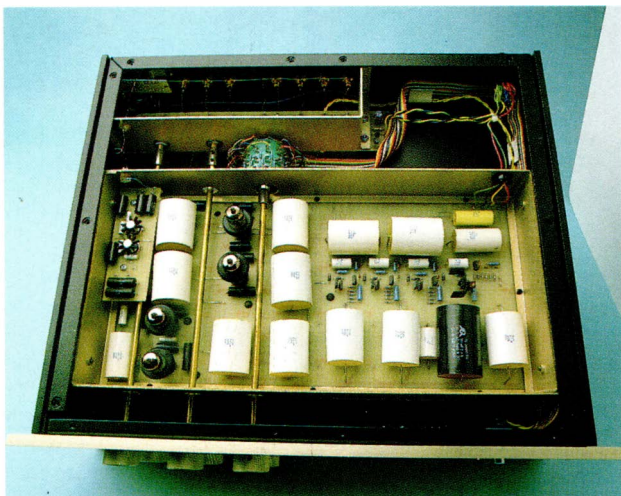
GENERAL DATA

PF1 preamplifier	
Maximum output	10V
Distortion	<0.1%
Gain: phono	40dB
line	21dB
Hum and noise: phono	<-74dB (ref 5mV)
line	<-80dB (ref 0.5V)
Dimensions (w x h x d)	48.3 x 8.9 x 31.8cm
Weight	7.0kg
Price	£1,350
MF200 power amplifier	
Power output	23dBW 8ohm load (20Hz - 20kHz)
Distortion	<40dB (for rated power 20Hz - 20kHz)
Sensitivity	2.2V (for rated power)
Hum and noise	-98dB (ref rated power)
Input impedance	100kohms
Dimensions (w x h x d)	48.3 x 22.3 x 39.7cm
Weight	26.8kg
Price	£2,150

Preamplifier

Conrad-Johnson *Premier 7a*

Audiofreaks, 15 Link Way, Ham, Surrey TW10 7QT.
Tel: (081) 948 4153



Think back to last year's *Collection* issue (July '89) and you'll recall the Conrad-Johnson *Premier Seven*, the most exotic preamplifier ever to have graced the pages of *Hi-Fi Choice*. Priced over £7,700 (at the time) and designed without compromise, this all-tube preamplifier is a dual mono design through and through - right down to the power supply which has two mains leads (one per channel) and two on/off buttons.

What better excuse for the editor to get his hands on this exquisite statement of the audio engineer's art once again for 1990's *Collection* than the fact that the *Seven* has been modified and further uprated during the past 18 months to become the *Premier Seven-A*. Not content with leaving well alone, US designers William Conrad and Lou Johnson have been tweaking their top-of-the-range preamplifier, modifications to the original design including the addition of a complex multi-pole mains filter in the power supply, an

improved phono stage (!) and a re-working of the (originally rather crude) suspension system for the circuit boards to reduce microphony. To my ears, and the ears of many other commentators around the globe, the *Premier Seven* was already indisputably one of the finest preamps money could buy. Nothing has changed, other than the fact that C-J's competitors now have even more work to do in

order to save face in audiophile circles.

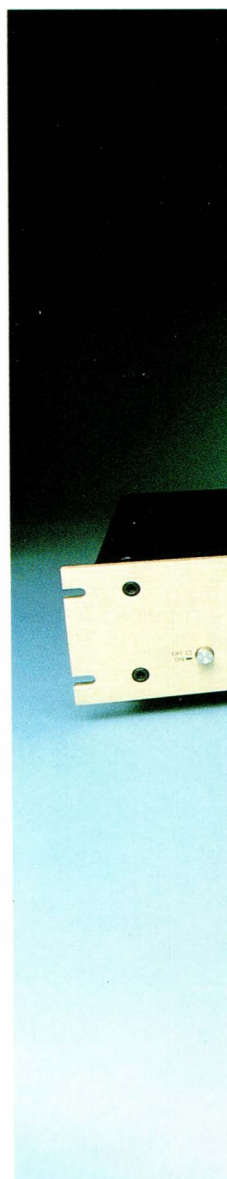
To recap, briefly, for those readers unfamiliar with the beast, C-J's *Premier Seven* is a cost-no-object exercise in all-tube preamplifier design. I've already mentioned the dual mono construction. This has its drawbacks in terms of operation, in that Messrs C and J deemed it too much of a compromise to include even a common mute button. So you've two of everything: to switch inputs (from phono to CD, for example) you must switch first one channel, then the other; volume setting is via two independent switched attenuators; and to mute the signal while switching sources or simply changing a record, you must mute first one channel, then the other. The things we have to put up with in the name of fidelity . . .

Talking of no compromises, each of the custom-made stepped attenuators (which switch discrete pairs of resistors) is in fact *two* attenuators. The part which regulates signal gain is physically separated from

the part that controls the row of LEDs on the fascia, there to ensure correct channel balance when you're setting the levels. One significant change in this latest *Seven-A* version is that the gain can now be adjusted in much finer increments.

Facilities are as before, with just four line level inputs but the bonus of separate Listen and Record selectors which are always useful. Sockets on the rear are all top quality Tiffany RCA phonos and there are two main outputs for bi-amped systems. Positioned next to each disc input is a small ten position rotary switch (one for each channel, remember) to adjust input impedance between 70ohm and 47kohm.

Internally the flavour is about as 'audiophile' as you can get. There are no electrolytic capacitors whatsoever, wiring is linear crystal solid silver cable, and wire-type Vichi resistors are used in the critical phono stage. The phono stage, incidentally, now employs two low-noise nuvistor valves rather than just the one used in the old *Seven*; this further improves signal-to-noise ratio, although C-J isn't making a fuss about it. The circuit is based around single triode valves with no negative feedback, and to absolutely isolate the preamp's individual gain stages (three per channel), each stage has its own discrete solid state regulated power supply (FETs). The separate box which houses the power supplies connects to the preamplifier via two chunky umbilical



conrad-johnson
Premier Seven

conrad-johnson
Premier Seven

conds. Yes, one per channel, of course!

In addition to the liberal use of tube dampers to reduce microphony in the valves, the circuit boards which house the audio circuitry and associated power supply regulators are 'suspended' on springy mounts. The suspension system has been improved considerably for the *Seven-A*, and instead of having to remove the lid to 'unlock' the suspension after shipping you now simply unscrew eight Allen bolts which are countersunk into the side panels. This means you've a new party trick with which to impress your friends - demonstrating the improvement in sound quality as you loosen the final bolt. Oh yes, it works!

Sound Quality

Our audio memories are short to be sure, and with the best will in the world I can't say, "The *Premier Seven-A* improves on the old *Seven* in the way it does this and that. . .". I have to say, however, that this year's hedonistic sojourn with C-J's flagship preamplifier proved to be an experience like no other.

I'll have to take their word for it that it's

'better' than its predecessor; in the 18 months since I last played host to a *Premier Seven* my system has improved so much anyway, that inserting the *Seven-A* into the system was always going to be an uplifting experience. Perhaps 'enlightening' is a better word to use, especially given the extraordinary bandwidth and unexcelled level of fine detail resolution going up into the supersonic regions. Treble purity - those 'silky highs' - had me rediscovering and re-evaluating recordings. And the power and drive in the bass is really quite fantastic. The even and natural midrange, always a C-J hallmark, remains unequalled in my opinion, while the resolving power of very low level detail is such that your system is being fed with far more information than usual - which means you get tremendous image depth, height, and size of soundstage.

Conclusion

Looking back to my comments of 18 months ago, when I tried to put in to words what makes the *Premier Seven* so special, I see that I failed miserably. I'm

The Conrad-Johnson Premier Seven-A: an audiophile's dream.

going to fail this time, too, because words alone are inadequate to describe the listening experience.

With this latest incarnation of its flagship preamplifier, the Conrad-Johnson company proves that the *Seven* is a 'living' product, and for its designers it doubtless will always be a labour of love. More than simply fabulous hi-fi, it's also supremely musical and enthralling to listen to. I guess they called it the *Seven* because it sends audiophiles who hear it straight into seventh heaven.

John Bamford

GENERAL DATA

Size (w x h x d):	19 x 7 x 16in
Preamp:	19 x 3.5 x 15.75in
Power supply:	60lbs
Weight:	40dB
Gain (phono stage):	29dB
Gain (line stage):	70ohm - 47kohm (variable)
Input impedance (phono):	20V RMS
Maximum output:	<200ohm
Output impedance:	£8,995
Price:	

Amplifier

EC Audio

Finestra

Unit E, Loddon Court,
Roentgen Road, Daneshill, Basingstoke
RG24 0NT.
Tel: (0256) 810858



Nine times out of ten when a new 'specialist' component arrives on the UK hi-fi scene - whether it be a turntable, amplifier or loudspeaker - it's a hand made item 'built to order' in some enterprising audio engineer's small workshop. However, the background to the *Finestra* preamplifier which began to appear in some good quality hi-fi shops earlier this year is quite, quite different.

The design of the *Finestra* is one man's vision of how a high quality preamplifier should be constructed, but here any similarity with the majority of new British-built audiophile components ends. Designer Tom Evans works in the heart of the UK's 'silicone valley' (around the infamous M25 'corridor'), where he is employed by a large hi-tech electronics company. The service this company provides includes computer aided design and manufacturing (CAD/CAM) of all kinds of electronics components - some of it doubtless highly secretive work for the Ministry of Defence. (They don't talk about it.) Tom is a hi-fi enthusiast, and has some unique ideas in amplifier design. A couple of years ago he persuaded his employer's board of directors to invest some time and money in a new venture: manufacturing hi-fi amplifiers. Consequently EC Audio was formed as a subsidiary company and the first fruits are what we see here, the £1,299 *Finestra*. £1,150 buys a line-only version for households with no record player; if buying a full-blown *Finestra* with

on-board phono stage, ideally you should specify MM or MC sensitivity/EQ. Switchable MM/MC costs no extra and is readily available if that's what you *must* have, but EC Audio says the sound will not be *quite* as good as a preamp optimised for one or the other.

RF shielding

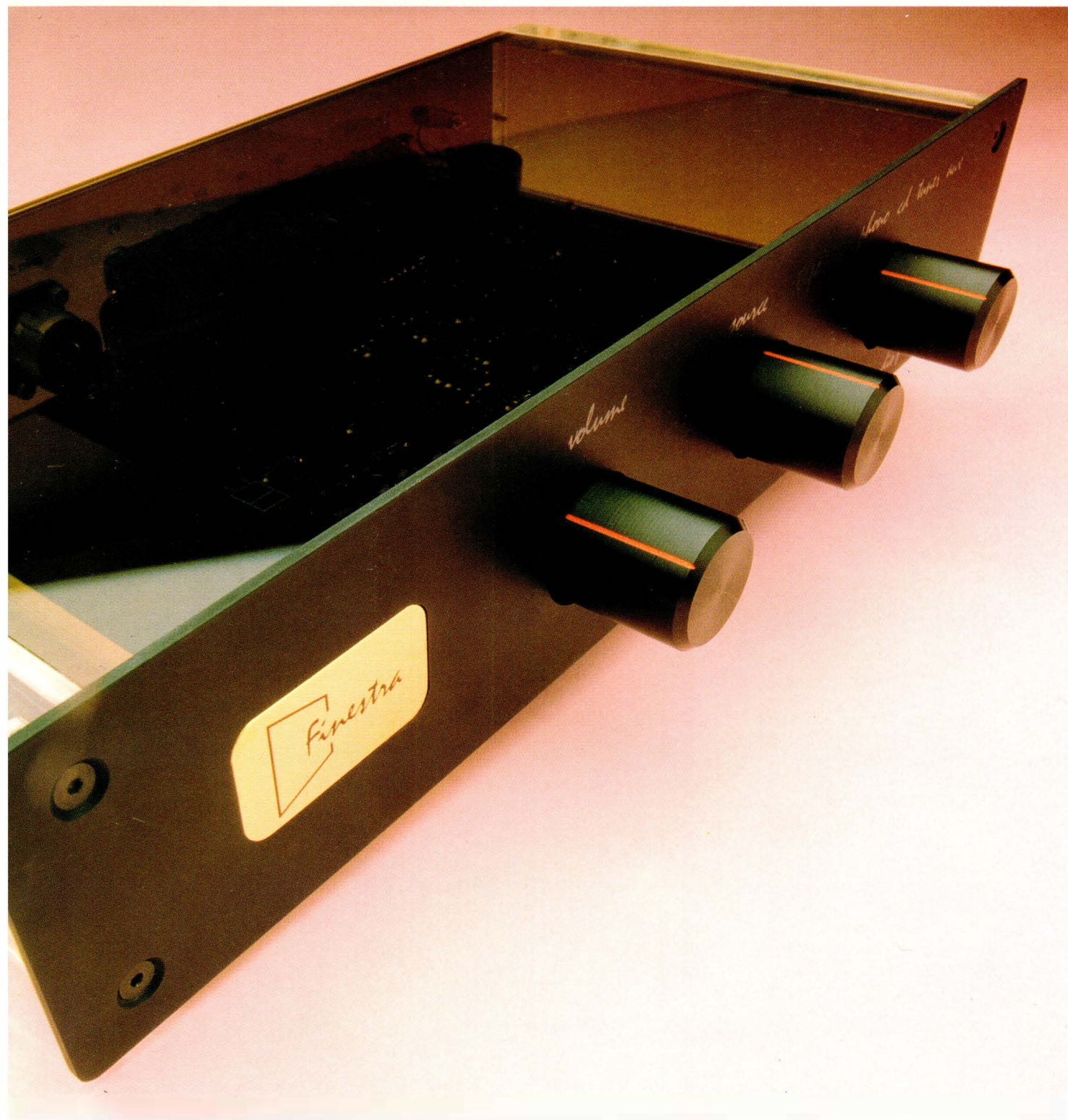
As you can see from our photographs, the *Finestra* is stylishly housed in acrylic - which is not just for show (though it does look nice) but helps sound quality too. Just ask DNM! Inside the clear case lies a (very) hi-tech six layer board with star earthing, fully shielded from RF. (Using a multi-layered board helps reduce RF problems, says the designer.) What goes against the grain, however is the *Finestra's* use of integrated circuits (ICs) when many audiophile preamp manufacturers make a big noise about the fact that they use only discrete transistor circuits - or valves, of course, but the valve versus solid state debate is a separate issue.

So how can the *Finestra* be a serious bit of kit when it uses ICs? What the designer says is this: "You should really regard the *Finestra* preamplifier as a composite amplifier. It uses op-amps the way most designs use transistors."

The company isn't giving much away about its theories, having spent a small fortune developing the ideas and patenting designs. I'm told that components have been selected for sound

quality not steady state measurement characteristics, that *Finestra* runs from "an overkill power supply", and that absolute phase integrity was high on the list of priorities when engineering the device. "Essentially our design philosophy is simple: small signals can be corrupted, and errors will be magnified later in the amplifier chain. And phase integrity is *vital* - including absolute phase."

The *Finestra* is certainly not what we've come to expect a high-end preamp should look like in 1990, but since first prototypes began to be auditioned by selected dealers in the UK it has caused quite a stir. I've



been fortunate enough to hear a *Finestra* in a variety of systems during the past few months and it's clearly going to win many friends. For my money it has got none of the transistor glare and 'congested' sound so commonly found in amplifiers which use ICs. Bandwidth can sound unimpressive on some systems, but this is a subjective effect which sometimes says more about the system than the transparency of the *Finestra* itself. It needs careful auditioning, because when suitably partnered it can give some very expensive audiophile components a run for their money. I've heard the *Finestra* fail

Finestra preamp: "It uses op-amps the way most designs use transistors."

to impress, and I've heard it sound quite superb. When it's superb you will hear valve-like sweetness and soundstaging coupled with extremely sharp focus and fast leading edges. The preamp's MC stage is also supremely quiet, while detail resolution is in the super-league.

It's a thoroughbred built to price, and while over £1,000 is a lot to pay for a preamp - any preamp - the *Finestra* is in fact competitively priced for the performance on offer, and is a snip compared to the

majority of high-end components.

And that's not to mention pride of ownership, which will doubtless further increase when EC Audio produces a similarly radical power amplifier to partner it.

John Bamford

First reviewed in *Hi-Fi Choice*, issue No. 81

GENERAL DATA

Input sensitivity (MC phono):	0.1mV
Input sensitivity (CD):	240mV
Input sensitivity (tuner/aux):	200mV
No. of line inputs:	4
Size (w x h x d):	395 x 85 x 230mm
Prices:	£1,299 (line only) £1,150


New Phases . . .

Absolute Sounds represent the world's finest names in audio. Here are just a few of the exciting new products currently available through selected dealers — our partners in perfection.



When it comes to Valve technology, Audio Research rule the air waves. With new advances in Valve/Solid-State hybrid systems, they continue to push back the sonic barrier and create products that become legends. A new amplifier has arrived which sets new standards - the 'Classic' 120 - a mono block destined to become yet another legend from the master craftsmen in audio design. Audio Research products continue to set the pace.

audio research



From PS Audio we are pleased to be offering their brand new 'Digital Link' CD interface. This advanced system is designed to give outstanding 'musical' quality to your CD transport. Imagine all the qualities of the best analogue systems - superior imaging with solid bass and smooth top-end - everything that CD ought to be! Add to this the stunning new PS-6 preamplifier and it's clear that PS Audio demand your audience.




Wilson Audio remain firmly at the very forefront of speaker technology and design. The Wilson 'WATT' with the 'PUPPY' woofer system is designed to deliver astonishing quality from compact units at all sound levels. Precision crafted to exacting standards, these loudspeakers can be tailored to suit both your system and the listening room. Wilson Audios' loudspeakers elevate moving coil performance up to a higher plane.

WILSON AUDIO




The new line-up from Krell in the summer includes a startling low cost amp - KST100 as well as two new 'super' amplifiers - KSA150 & KSA250. Words are totally inadequate when trying to describe how they sound. From Krell Digital come the MD1 and MD2 CD turntables and the SPB32X & SPB64X processor and power modules. They are stunning in both looks and sound.



Valves in digital CD players? Then it can only be from the master exponents of an exciting technology. The California Audio Labs CD players are designed to offer audiophiles the best of both worlds. Digital quality and that special sound only valves bring. The new line-up of CD players includes the 'Aria MkIII', 'Genesis', 'Tercet MkIII' and 'Icon'. All bring a special new magic to the world of CD. C.A.L. put the music back in CD!

CAL



Koetsu moving coil cartridges are all legendary. Each one a masterpiece, each one designed to deliver sonic perfection. A Koetsu is the ultimate cartridge for the truly discerning audiophile - every one handbuilt and individually tested to be statements of Mr. Sugano's craft. Now, with their new cartridge 'Urushi', Koetsu has once again achieved international acclaim and set even higher standards. Koetsu cartridges are music.



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Preamplifier

The Equinox

Equinox Audio, 39 Fraser Close, Daventry, Northants NN11 5HD. Tel: (0327) 704231

Don't be misled by the wording on the front panel. Although Equinox Audio chose to call its first domestic hi-fi product a 'moving coil head amplifier', the *Equinox* is in fact a moving coil *phono amplifier*. This means it is far more than just a 'signal booster'; it is a dedicated MC phono stage and RIAA amplifier.

The output from the *Equinox* is at 'line level', around 0.5V (depending which cartridge you use); therefore it connects to any of those inputs labelled Tape, Tuner, Aux or CD, for example. Designed to be of top-notch quality, the idea is that it should be used instead of the phono stage which is built into your amplifier, the implementation of which is bound to be compromised in one way or another. And in esoteric systems, the *Equinox* can be partnered with a passive preamplifier or one of the new breed of 'line-only' preamplifiers which seem to be becoming ever more popular in these days of the compact disc. Equinox Audio has just launched such a component - and we managed to procure a review sample just in time for this *Collection* issue.

Battery power

The *Equinox* phono amplifier costs a cool £795 and for this not insubstantial sum of money you get a serious bit of kit indeed. Small but impeccably formed, its power supply is a pair of sealed lead acid batteries housed in a chunky case and kept on continuous float charge from the mains, while the amplifier itself is no larger than a packet of cigarettes. Constructed using surface mounted components, it provides a low noise *balanced* input followed by a passive RIAA equalisation stage, the buffered output being via a pair of gold plated phono sockets.

The amplifier is mounted in a housing machined from solid aluminium and is designed to be mounted on the leg of your turntable table, as close as possible to the base of the record player's tonearm. A special (balanced) arm lead is provided, dealers being instructed to ensure that the lead is kept as short as possible.

One thing you notice immediately on wiring the phono amplifier in to your system is the remarkable 'silence'. This is

just the device for owners of *very low* output cartridges - like the Ortofon MC3000/11, for example. Used with my Townshend *Rock Reference* and an Audio Technica OC9 moving coil, the *Equinox* offered a relaxed and civilised sound - clear and smooth yet superbly dynamic and detailed too.

Less is more . . .

It shows its pedigree in its superb soundstaging and recreation of depth perspectives. Never before has my system produced such 'out-of-the-box' images, using loudspeakers as diverse as KEF 105/3, Snell *Type C* and the superb JBL *XPL 200s*. At first I thought the *Equinox* phono amplifier a shade 'dull', suspecting a gently rolled-off treble response. What I was observing, in fact, was the total absence of electronic 'hash'; the *Equinox's* response, I'm told, is ruler flat. Less is more, as the saying goes. . .

Clearly £795 is a hefty price tag, but with top-flight moving coil cartridges costing as much as this and more, many audiophiles looking for the best will consider it a steal. Construction of the *Equinox* is first class, it comes with a three year guarantee, and once installed in your system you'll wonder how on earth you ever lived without it.

Equinox Audio's line preamplifier is a

serious bit of kit too, having been designed with fantastic attention to fine detail. At £1,850 it's far from cheap - but for this princely sum you get a state-of-the-art control amp featuring top-flight semi-custom Penny & Giles potentiometers, all the circuitry having been carefully configured to make the signal paths as short as is humanly possible. The separate left and right channel volume controls are friction locked, and one really nice touch is that the controls connect to the front panel knobs via non-magnetic stainless steel shafts mounted on tonearm bearing-style ball races. This gives the controls an expensive, 'silky-smooth' feel.

There are six line inputs, one of which would normally take the output from the separate phono stage, plus a tape monitor loop. All the phono sockets are insulated from the rear panel, while there are two earthing posts, one connected to mains earth and the chassis (labelled 'ground') and the other insulated from it (labelled '0V'). Flexibility is the name of the game here, for the lowest possible hum levels in your system, and there are two sets of outputs for bi-amped setups.

It's a class act, that's for sure, and as a combination the line amplifier and phono stage work together beautifully. The phono amplifier, as I've intimated above, is one of the finest I've ever had the pleasure to hear, while auditioning the line amplifier with CD and DAT sources showed the device to be superbly transparent. Assuming that you don't mind paying the price for top quality performance, I can recommend it highly.

John Bamford

First reviewed in *Hi-Fi Choice* issue No. 88



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MAINS PURIFIER



PANDORA

Goldmund *Mimesis 4*

Absolute Sounds Ltd., 58 Durham Road, SW20 0DE. Tel: (081) 947 5047

Looking down the current price list of Goldmund wares is a sobering experience as even their cheapest products cost more than many respectable hi-fi systems. The *Mimesis 4* tuner is no exception and costs £4,900, but it isn't the most expensive hi-fi tuner around. That prize still goes to Davidson-Roth's *Day-Sequerra* 'FM Broadcast Monitor Tuner' at £14,046.

The *Mimesis 4* tuner is housed in Goldmund's standard slim but deep rack mount case. The frame is made from fairly thick natural aluminium alloy panels, with top and bottom covers finished in black.

On the inside, the construction is to the familiar Goldmund standard, with good quality components and excellent quality double-sided printed circuit boards. Two boxed transformers feed ranks of Philips wire-ended reservoir capacitors, which are followed by discrete DC regulators. The RF and IF circuitry are housed in a screened can which stretches the depth of the box. A centrally-located board deals with logic for the presets and tuning. The audio output stage is close to the output phono and is DC coupled.

Lab Test

The sensitivity for both stereo and mono is a little lower than I had expected and somewhat below that available from the majority of current Japanese tuners. Ultimate signal-to-noise ratio was also unexceptional although good enough under most conditions. Pilot tone rejection was well above average for both the 19kHz and the 38kHz tones with all sidebands well suppressed. AM rejection measured a fairly standard 62dB down. The muting threshold was sensibly set and alternate channel selectivity was very good on the narrow setting and practical on wide. I have seen better capture ratio figures but the compromises made are in keeping with the other performance figures and should in practice be good enough to suppress unwanted stations.

Total harmonic distortion is low enough but once again unexceptional as was stereo separation, although in practice the better-than-30dB separation up to 10kHz is up to the job when the quality of



the broadcast signal is taken into account. Channel balance is very good and the output level of around 600mV for 100 per cent modulation coming from a source impedance of 600ohms should mate well with most preamplifiers. The frequency response was perfectly flat through the important midband area and up to some small in-band ripple caused by the 19kHz filter, which produces a 6dB spike at around 17kHz before falling rapidly.

Sound Quality

On switch on, the audio outputs are muted until the circuits stabilise (basically because they are DC connected) and the time constant used is several minutes; you have to hang around for a while before any sound is available. When it eventually is, it's worth waiting for, because it is very transparent to what is being transmitting. Unfortunately for the majority of radio stations - those playing mainly CDs - it shows up limitations in the stations' replay equipment. It is only on live broadcasts that the true worth of this tuner becomes apparent and everywhere it works exceptionally well.

The sound is balanced, transparent and has good articulation, detail and life. On most material it sounds a little shut in. It lacks a touch of treble air, but that is mainly a problem with the medium, not this particular tuner. Stereo stage width and depth are first class. Images have great solidity and it brings radio plays to

life with uncanny reality. It goes without saying that the *Mimesis* needs an exceptional system to show how good it really is.

Conclusion

The measured technical performance of this tuner is adequate without excelling in any one area. If specifications are important to you, then the *Mimesis* will be of no interest. I liked the styling and the simple ergonomics. The sonic performance seemed limited by the majority of broadcast material received, such is this tuner's transparency. But unless the information was exceptional (as found with one or two live broadcasts) then it was difficult to justify the high price tag. However, it must be of interest as a high-end tuner and one which certainly complements the rest of the Goldmund range.

Chris Bryant

TEST RESULTS

RF Sensitivity for 50dB S/N ratio:	Mono 5uV Stereo 40uV
S/N ratio (CCIR/ARM weighted, 1kHz ref):	Mono 69dB Stereo 63dB
Pilot tone rejection, 19kHz/38kHz:	49/88dB
AM rejection:	62dB
Muting threshold, R.F. level:	25uV
Alternate channel selectivity:	>80(narrow)/2(wide)dB
Capture ratio:	6(narrow)/2(wide)dB
Output level, 100% modulation:	596mV
Output impedance:	600ohm
Channel balance (stereo):	0.10dB
Stereo separation, 1kHz, 5kHz, 10kHz:	32/32/31dB
THD at 100% modulation, 1kHz:	45/43dB (mono/stereo)
Dimensions(w x h x d):	482x54x427mm (WDH)
Price(typical):	£4,900

Preamplifier

The Gryphon

Gryphon Audio Designs, Hermodsvvej 3a, 8230 Aabyhoej, Denmark. Tel: (86 15 15 88)

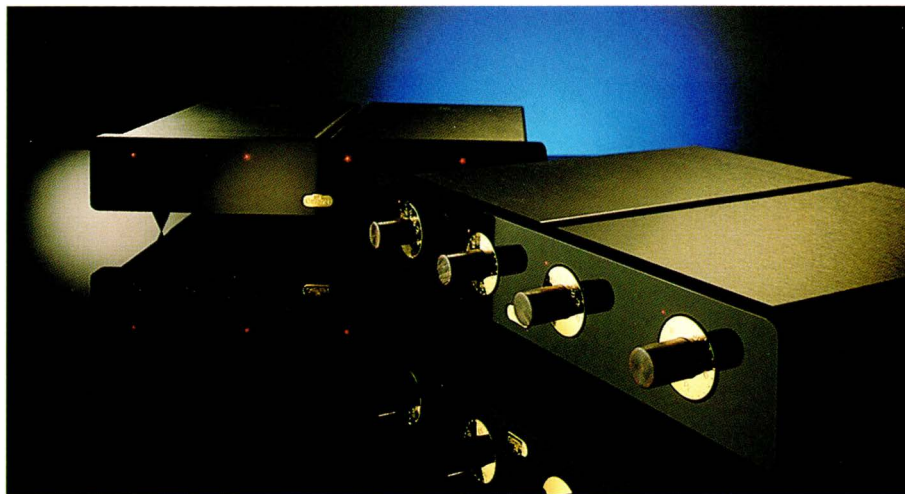
The *Gryphon* preamplifier is a classic case of 'less is more'. It strips a preamp down to the absolute basics: volume control and source selector. Although this suggests only two knobs and an on-off switch, the company manages to pack in all manner of options without compromising the minimalism.

The preamplifier is completely dual-mono, the fascia actually connecting two entirely separate enclosures. Because of the dual-mono design, separate left and right controls are required for the two primary tasks, but positive detents make the settings easy to repeat and match.

The back features WBT gold-plated phono connectors for phono, CD, tuner, tape and auxiliary, two main outputs (for bi-amping or running two systems), and screw connectors for the power supplies. No tape loop is provided, but the second set of outputs can be used for recording if the user doesn't touch the volume controls while the recording is in progress. Each chassis has its own earthing post and there's an additional socket above the phono input to accept resistors for setting correct values for moving-coil cartridges.

The basic version comes with four separate power supplies (or two, if purchased in line-level-only form), requiring four mains sockets. These are housed in small die-cast boxes. The new, 'deluxe' power supply requires only two mains sockets, as each half (identical to the chassis which make up the preamp section) also powers the phono stages. The new power supply features the same faceplate as the preamp, minus the controls, for a far more aesthetically-pleasing presence. Both units rest on large Tiptoe-style feet for Goldmund-style 'mechanical earthing'. Other supplied niceties include a perspex tray pre-drilled to hold the resistor plugs when not in use and a pair of white gloves to wear when handling the preamp.

The internal contents are impressive, including hand-made, Swiss 24-position passive resistor volume controls. Behind each pot is one of the very few wire links in the *Gryphon*, as the majority of connections are direct. This link is to the line preamp board, followed by the RIAA



network, then the MC board. (Gryphon fits a blank board in the MM version.) The rest of the chassis is occupied by the mains filtering network. This concern is reflected throughout the unit, as Gryphon considers mains quality and the way the mains input is handled as a top priority. Additionally, the company goes to great lengths to entice the user into experimenting with earthing arrangements, one of the features being a massive busbar to allow star-earthing of the entire system if so desired.

Other Gryphon trademarks include fully discrete circuitry, non-resonant and non-magnetic chassis materials, zero negative feedback, separate regulated power supplies and modular construction with little or no internal wiring. Gryphon prefers to employ custom components, including the C-core transformers, or items sourced from the computer industry.

System matching, like day-to-day operation, is straightforward, the preamplifier working beautifully with an array of amplifiers including the Classé DR-8, the Aragon 4004, Counterpoint SA-1000 and others, but the *Gryphon* is exceptionally fussy about interconnects. Masterlink proved an excellent match, as did Audio Research interconnect.

Sound Quality

The *Gryphon* in upgraded form leads the pack for retrieval of fine detail and overall precision. The top end remains unchanged, still clear and crisp, with lightning-fast transients possessing perfectly formed edges. What the new

power supply adds to the recipe is even greater dynamic capability and an absence of any form of constraint.

Good though the *Gryphon* sounds straight out of the box, it needs an exceptionally long run-in period to reach a state where the more clinical traits of a highly detailed performer are exorcised. After two or three weeks of constant use, the sound acquires some warmth, bringing it closer to a valve sound than is at first suggested. Then, one can better enjoy the truly holographic imaging, rock-steady positioning and openness. Additionally, the *Gryphon* is so quiet that newcomers to the high-end who were weaned on CD will find an instant rapport.

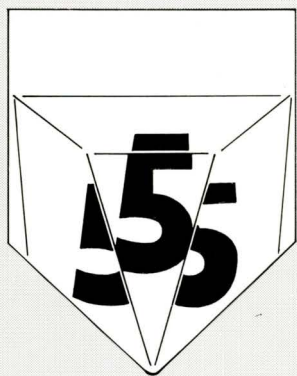
The price one pays for such authoritative handling of the programme material is marginal over-damping in the lower registers, and ruthless exposure of weaknesses in the source components. Bright or sibilant front ends should be avoided, and any CD player suffering from digital nasties should be avoided.

Conclusion

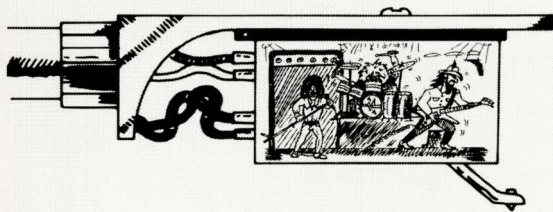
At a price of around £6,500, the *Gryphon* must compete with the finest preamps money can buy. And - even forgetting its peerless finish, build quality and the pride of ownership - this product does rank with the all-time greats. Provided that the rest of the system can keep pace with the demands made by the *Gryphon*, the preamplifier must be regarded as a contender for the state of the art.

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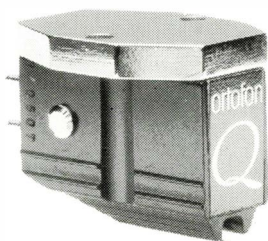
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Loudspeaker

JBL XPL 200

Harman (Audio) UK., Mill Street, Slough, Berks SL2 5DD. Tel:(0753) 76911

Now that's what I call a loudspeaker," declared Chris, our photographer, as I manhandled the XPL 200 out of the service elevator and into his studio. It was a natural enough reaction, I guess, as one look at this giant JBL monitor is enough to tell anyone that the speaker means business.

JBL describes its £2,000 XPL 200, top model in the XPL range introduced to the UK last autumn, as 'the most refined home loudspeaker JBL has ever made'. In its literature the company holds great store by the fact that it makes its own drivers, crossovers and cabinets, components which are designed and built to work together without compromise. 'The XPL series represents the limits that this approach can be taken (*sic*) within the confines of present technology', is the company's bold claim. Is JBL really saying, therefore, that the '200 - the top of-the-range XPL - is the best loudspeaker it can make? What about the awesome £20,000 horn-loaded K2s?

Well, perhaps it is the best speaker the company can make. Certainly it's one of the finest sounding transducers I've ever had the privilege to enjoy in my living room, rating up there with the Duntech *Marquis* and *Crown Prince* for drama, excitement and dynamics. Having had the opportunity to play around with the '200 at home for many weeks, experimenting with subtle changes in room positioning as well as partnering electronics, I've had these speakers really singing. Imagine a kind of grown up Yamaha *NS1000*, with explicit detail and fast dynamics, coupled with tremendous bass power and control. That's the XPL 200. There's no strain, no nasty high frequency aberrations or 'glare' (often a criticism of high-power monitors), just a satisfying solidity coupled with a massive soundstage.

The loudspeaker has proved extremely transparent to source equipment, and is so clear and effortless in the bass that it



makes for a great reviewer's tool when assessing electronics. And the great thing is, you can drive it with just about anything. The load is nothing to worry about, sensitivity is high at 90dB for 1 watt, so even with low-powered triode valve amplifiers I've been in danger on several occasions of committing a serious breach of the peace.

Off the floor

The XPL 200s came into their own when I got them off the floor. You can use them floorstanding, adjustable feet at the front enabling you to tilt the speaker as required, but JBL manufactures some matching MTX stands which screw into the base of the enclosures and in my set up these made all the difference. Standing nearly

five feet tall on their stands, they sound as business-like as they look.

The trapezoidal enclosures are extremely solid, made from MDF and weighing 90lbs each. The baffle is a multi-layered affair of reaction moulded foam, stepped to provide some degree of time alignment with a neoprene surface coating to reduce diffraction effects. The tweeter, of course, is JBL's by now familiar ribbed titanium dome, married to a new titanium midrange driver which has a substantial 3 inch voice coil. The XPL 200 is actually a four-way system, a 6.5 inch mid/bass driver operating in its own sealed sub-enclosure down to 300Hz which is where the 12 inch woofer takes over. A tuned port vents on the rear.

Other details include a high frequency (-3dB) contour switch (totally unnecessary in my opinion), gold plated terminals with bi-amping facilities provided, and a switch which takes the crossover partly out of circuit. JBL makes a two-way active crossover for its '200, and based on what I've experienced from these monitors I'd bet experimenting with some form of active drive could be a lot of fun.

John Bamford

First published in *Hi-Fi Choice*, issue No. 85

GENERAL DATA

Power handling:	200W
Nominal impedance:	6ohm
Sensitivity (2.83V @ 1m):	90dB
Crossover frequencies:	300Hz/1.1kHz/4.5kHz
Biamp crossover frequency:	250Hz
Weight:	40.82kg (90lb) each
Dimensions (w x h x d):	40 x 100 x 35cm
Price:	£1,999

Jeff Rowland *Model One*

Gamepath Ltd., 25 Heathfield, Stacey Bushes, Milton Keynes MK12 6HR.
Tel: (0908) 317707

Jeff Rowland has come a long way since the launch of his first rudimentary Class A amplifier over a decade ago. He's also come to appreciate the problems of marketing what are, by UK standards, outrageously priced components. Hence the new *Model One*, not exactly cheap at £2,500 but still the baby of the Rowland range. By way of justification the *Model One* is said to include no coupling or compensation capacitors, cutting harmful dielectric absorption to a minimum. Furthermore, it also plays host to JR's sophisticated DMT electronics, but more of this later.

Superficially, the *Model One* looks rather like a scaled-down *Model Three* with its 12mm milled-alloy fascia and row upon row of fluted heatsinks. Yet despite its prodigious bulk, the *Model One's* sleek lines and contoured edges prevent it from looking brutish. Indeed the silver-anodised version can appear quite elegant when pitched against much of the US brawn. Neither is there too much fresh air inside the amp - JR couldn't reduce its size even if he really wanted too!

The rear panel is equally busy. Bristling with multiple screw-down speaker outlets for bi-wiring, there are also two DIL switches enabling you to alter the input impedance of the amp. Its high 100kohm setting is most appropriate for use with valve preamplifiers while very low-output impedance preamps, such as the Deltec *DSP-50S*, are quite happy driving the minimal 3kohm setting. Otherwise the standard 20kohm option is a safe bet.

More important is the feasibility of direct-coupled balanced operation via the pair of XLR terminals. Conventional single-ended operation is available through either of the phono inputs (inverting and non-inverting), the mode most likely to be employed with 99 per cent of preamps. Balanced output preamps are few and far between while JR's own *Coherence One* is prohibitively expensive at £4,000. Kenwood's *L-1000C*

preamp represents a worthy and affordable alternative, and it will certainly allow the benefits of JR's DMT topology to be realised.

DMT is an acronym for Differential Mode Technology, a feature of all previous JR power amps as well as his high-end preamplifiers. It's really an electronic version of the transformer-coupled balanced operation used in most professional installations. It concerns the use of anti-phase signals that are summed in a differential amplifier, this responding only to the difference between positive and negative inputs.

Consequently, any signals, such as noise and distortion, that are common to both inputs are cancelled out. Hum and noise picked up from mains transformers, radiated RF noise and symmetrical harmonic distortions are all examples of common-mode noise. Of course, in practice the degree of suppression is determined by the amp's Common-Mode Rejection Ratio (CMRR), JR's figure of 90dB (32000:1) being a particularly good result.

Under the cover, pride of place goes to a 600VA toroidal mains transformer which is both encapsulated and shielded in a separate can next to a pair of huge 32000uF reservoir electrolytics. And this is a 60W amp? Well, in reality you can squeeze about 75W into 8ohm with a healthy +2.3dB rise to 130W into 4ohms. It's this exceptional load tolerance that distinguishes the *Model One* from the everyday 60W integrated amp. You can push it hard into 'difficult' speakers but, unless the boxes are particularly insensitive, the *Model One* will rarely get out of its depth.

Accordingly it's also dual-mono in construction with the output circuitry mounted directly on the rear face of the heatsinks. JR has stuck with his tried-and-tested Class A emitter-follower driver stage followed, in this instance, by another five pairs of devices acting as parallel

current-dumpers. These are richly biased so the amp heats up considerably while standing idle. Oddly enough, it seemed warmer, relatively speaking, than I remember either the *Model Three* or *Model Seven's*, an observation that might have subjective repercussions.

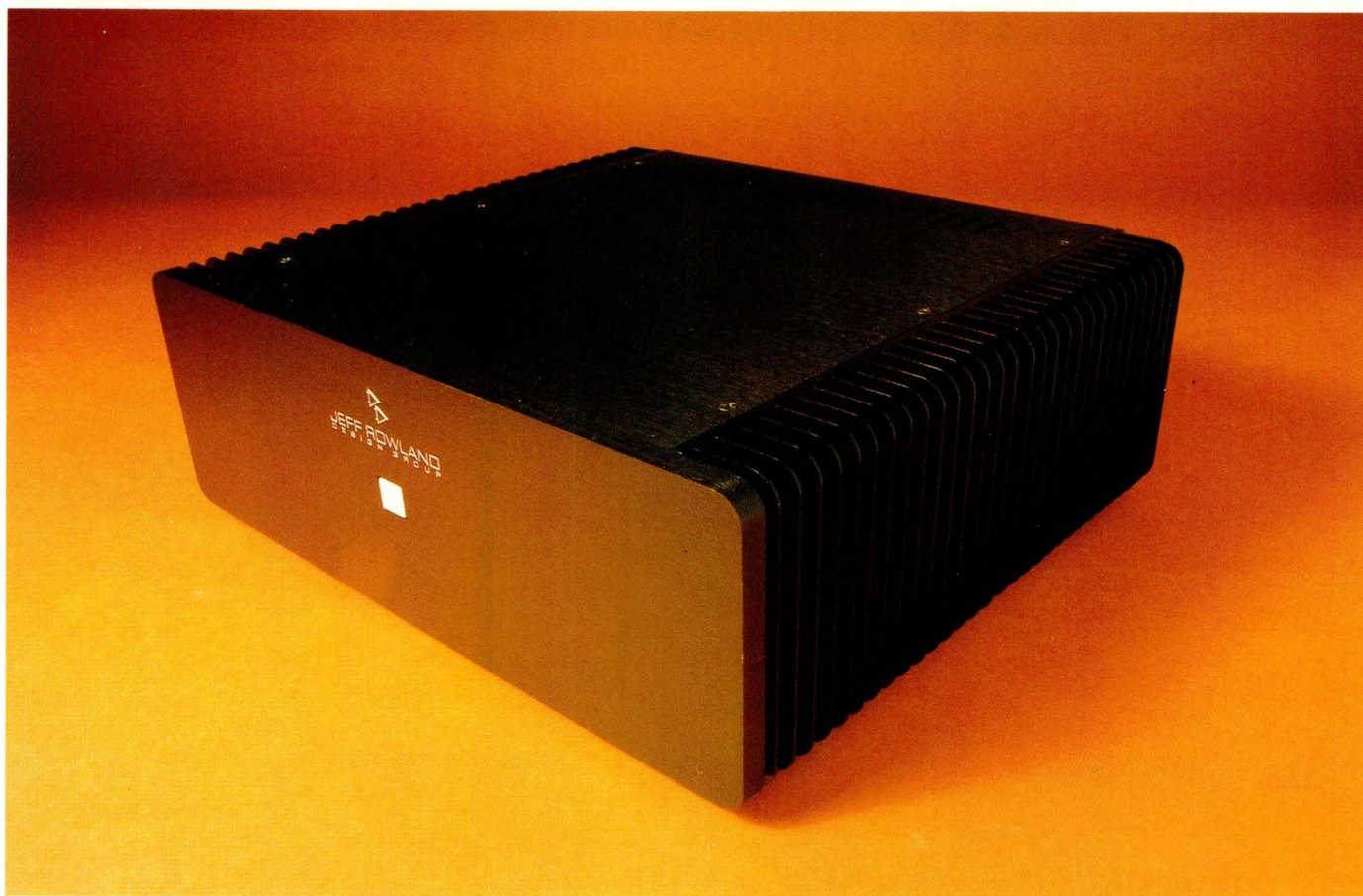
Still, JR has included a nominal 'standby' mode whereupon the power consumption drops to just 25W, sufficient to keep the lower-level input circuitry ticking-over. This is where we find all the action. Easily missed on brief inspection are two modular input blocks which contain the crucial DMT circuitry within a single direct-coupled stage.

By potting this FET-based differential amplifier in epoxy resin JR ensure very tight thermal and mechanical stability - remember, there's no coupling caps nor any significant degree of localised feedback. Still, in the rare event of failure, it remains a simple matter to replace either 'block'. JR has also had the presence of mind to include extra non-invasive protection circuitry and, if all else fails, a couple of fast-blow 5A speaker fuses!

Sound Quality

I was able to use this amp for a good two weeks, more than enough time to experiment with different preamps (including the new Deltec *DSP-100S*) and speakers. Snell's *Type EII* were a particularly good match, their high sensitivity and neutral balance proving a transparent window to the undoubted charms of the *Model 1*.

This is an amplifier that brings the subtlest and most obvious of sounds into sharp relief while maintaining, subjectively at least, a genuine sense of proportion. Technically it's not as precise or as icily transparent as the very best even though its balance remains both neutral and free of discontinuity. It certainly provides a clean backdrop for the construction of a broad, deep and delightfully open acoustic.



So, in practice, it seemed easy to hear way back into the recesses of the soundstage, unhindered by any compression or abruptness in its portrayal of the music's more immediate elements. I certainly never found the need to consciously hunt down and identify stereo images of individual performers or instruments - tactility and presence are JR's watchwords.

I must admit it was this particular facet of its performance that most endeared me to Rowland's *Model One*. As has been highlighted in successive issues of *Choice* amplifier reviews, few designs are able to fully realise the undemanding yet effortlessly fluid sound available from a good PDM source. The *Model One* comes closer than most in this respect, easing the music from the speakers with an unhurried yet masterful sense of control.

It's almost as if there's an intelligence behind its reconstruction of a believable acoustic just as there is behind each precisely focused stereo image. But the overall effect is not a deliberate or obvious one - these aspects of its control merge seamlessly to afford a captivating and convincingly musical performance.

This held true almost regardless of the complexity of the music itself. A simple yet effective passage, such as *Night Falls* from Peter Gabriel's *Passion* CD, sparkled with life as the delicate patter of finger-cymbals danced like fire-flies around the expansive, ambient core of flute and violin. The music is elementary but, via the Rowland *Model One*, its emotive power

The Model One can handle the most demanding music.

was unexpectedly disarming.

Power, in its crudest sense, is not abundant in the *Model One*, yet the signs of impending clipping are gratifyingly innocuous. There's a slight hardening to brass instruments, for instance, while strong female vocals lose a little of their warmth and lucidity. It does not begin to sound crude or ragged, just a little stressed.

In this respect, the *Model One* must bow to the *Models Three* and *Seven* with their substantial headroom. Nevertheless, I was left with the impression that the *Model One* was more capable of tracking the dynamic contrasts of a vivid orchestral performance than these more costly amplifiers. The abrupt changes of mood that accompany Mussorgky's *Night On Bald Mountain* (now on MFSL gold) border on the schizophrenic, yet these contrasts were revealed in grand perspective by this baby of the range.

The dull roar of strings and drums reached thunderous proportions as the amp drew deep into its reserves, still saving sufficient breath to cope with the abrupt, raw announcements of the horns. The sound bustled with activity, each instrument revealed in glorious colour and bristling with a natural energy that, though easy to identify, did not encroach upon the subtle tonal hues of its neighbours.

Once again, there was this sense of

perspective, proportion and order, the individual characters of each instrument dove-tailing like the pieces of a jigsaw. The *Model One* belongs to an underpopulated group of amplifiers that refuse to collapse when faced with the most demanding styles of music. Neither is its 'sound' particularly difficult to appreciate. It's not perfect but neither is it demanding or glossy, just exceptionally pleasant!

Conclusions

This is one of those rare amps that neither glamorises nor suppresses the natural enthusiasm of music, almost regardless of its origin or style. At the heart of a good system it will leave you with, to all intents and purposes, an uncompromised view of events. A view that few listeners could fail to endorse despite what is an extraordinary sum to pay for a 60W amplifier.

But then the *Model One* is no ordinary 60-watter. Think of it as a manageable, lower-powered version of the *Model Seven* with the dividend of superior sound quality!

Paul Miller

GENERAL DATA

Rated power (bridged):	60W (240W) into 8ohm 120W (360W) into 4ohm 215W (500W) into 2ohm
THD:	typ <0.035%
Sensitivity:	136mV for 1W, 8ohm
Dimensions (w x h x d):	430x145x380mm
Price:	£2,500

KEF 105/3

KEF Electronics Ltd., Tovil, Maidstone, Kent
ME15 6QP. Tel: (0622) 672261

About five years ago, with the introduction of the 104/2, KEF embarked on the development of a new range of *Reference* models characterised by new technological and design techniques such as Coupled Cavity Bass and Conjugate Load Matching. What makes the 105/3 so special is not so much the fact that for the first time all KEF's ideas and techniques have been combined into a single speaker, but that for the first time they have truly gelled. The promise inherent in speakers such as the 104/2 and *Reference 107* has finally been realised.

Active bass equalisation

KEF's Uni-Q driver, Coupled Cavity Bass system and Conjugate Load Matching in the crossover has been well documented before - and space doesn't permit a rehash here. However, what we must talk about is KEF's active bass equalisation system, designed to extract greater bass extension from domestically compatible boxes. Taking the form of the *KUBE*, a small box of electronics that sits between pre and power amps (or in the tape loop of an integrated amp), the concept has finally reached fruition with the 105/3 - it doesn't necessarily have one! KEF realised that many people were unhappy with the existing *KUBE* used in previous *Reference* loudspeakers. Customers and dealers were unclear on its functions and use, and suspicious of its build quality. The company decided to ask around and find out why *KUBE* wasn't the major selling point it thought it should have been. And to its great credit, KEF actually listened to

the answers it received and acted on them. The new *KUBE* is an optional extra, and is built to far higher standards than the old model. It is also much simpler and more versatile in use.

A largish box at 110cm high, the floor standing 105/3 achieves elegance by dint of its narrow (280mm) baffle. Indeed, with the grille in place it looks almost svelte. Veneers available are black, walnut, and rosewood. With the grille off, which is how it will be used by most people, it looks imposing without being aggressive, the finish of the drivers and sub-baffle being to a high standard. Both spikes and hard plastic feet are provided. The overall effect is one of elegance coupled to latent power and whilst I can't fault the standard of finish, a few more imaginative finish options would be nice.

Extremely heavy, the 105s are actually easy to manoeuvre and position due to the ready hand hold provided by the bottom of the sub-baffle. I've used them now in three rooms of different sizes and find them surprisingly tolerant of positioning. If you can give them a good foot to the back wall and toe them in to fire right at you or just to either side you shouldn't have too many problems. Having said that, they will improve with space, and in the largest room I had access to, about two feet behind and three feet to side walls gave the best balance. The point here is that they are surprisingly unfussy, and, should you choose to use the optional *KUBE* equaliser, should become even less so.

When it comes to hooking them up, a few guide lines are in order. You must bi-wire these speakers! I used both RS solid core and DNM cables from the reasonably priced end of the market, and Audioplan *LS12* from the opposite extreme. Other equipment used included Roksan and VPI turntables; Audio Research, SP Audio *SP 1.5* and DNM preamps; Audio Research

Classic 60, biamped DNM *Gems*, and Jadis *JA30* amps; and Arcam and Micromega CD players.

What did I compare them to? Live sound as I know it, but also a number of other speakers, and here we run into the first problem. The 105/3 tends to defy comparison for reasons that I hope to make plain. As to its sound? Well. . .

The 105/3 is remarkable. It is genuinely neutral and exceptionally coherent, simply sounding like whatever you feed into it. It does err very slightly in the treble where there is a touch of hardness not found with the best electrostatics and ribbons, but it has none of the glassiness or synthetic brilliance which I associate with many metal drivers. Its tonal palette is exceptionally wide, rivalled only by the Audioplan *Kontrasts*. Different instruments are presented with their own distinct spectral balance and tonal character, while different singers likewise have their own voices and personalities.

A seamless journey . . .

Integration of the drivers is exceptional. The merest blurring of massed cellos, a slight softening of bass guitar and some synthesiser lines are the only glitch in a seamless journey from deep bass to high treble. As each parameter of performance is assessed, time and again the 105 pushes close to being the best of British loudspeakers. Transparency and imaging, bandwidth and dynamic range. . . in every traditional area the KEF excels, setting new standards at its price and approaching the undermining models at



two to three times its cost. This doesn't in itself make it a great loudspeaker. To achieve greatness it must combine these virtues into a musically satisfying whole. The world of hi-fi is littered with products which make great hi-fi but lousy music. The KEF doesn't fall into that category, avoiding it through a combination of attributes directly linked to the technology which has gone into it.

The coincident source arrangement of the drive units in the 105, allied with the low coloration cabinet allow the speaker to present a mass of fine detail. More importantly, they allow it to be presented in an integrated and intelligible fashion, they don't just fire detail at you. The sound coming out of the 105s makes sense. Images are presented specifically, in space and in relation to each other with a sense of dimension and solidity. They do not move. They do not leap forward or climb upwards with changes in level. The sonic

The KEF 105/3: begs comparison with much more expensive products.

picture is stable, never leaving you in any doubt as to who or what is playing.

Even without the *KUBE*, the 105/3 has exceptional bass extension and control. This brings not only previously unheard bass information to light, but also provides the all important clues which create a believable soundstage and image. The soundstage thrown by the 105s can be massive, extending far beyond the speakers with real depth and height where appropriate.

The ace in the hand: Conjugate Load Matching and high sensitivity makes the 105 easy to drive. Real easy? No, this, doesn't mean that you can hook them up to a *Cyrus One*. What it means is that you *can* use low powered but high quality amps like the *DNMs*, the *Lectron JH50*, or the fabulous *Jadis JA30*.

My preference for the above devices is well known. I revel in their ability to resolve the tiny changes in dynamic range and level which brings a performance to life, the little clues which give you the sense of a person playing an instrument rather than a machine. The accent of a note, the tiny sustain, the rasp of resin and the click of finger nails. These things all bring music to life. Because of its sensitivity and ease of drive, the KEF transmits this information with alacrity.

Buried in the back of my record collection is an album I love. It's on bright yellow vinyl, it's by Cheap Trick and it's called *Live at the Budokhan*. It's also one of the few live albums I've ever heard that conveys the sheer energy of a totally over the top rock band. With the 105s it sounds like the boys are in your front room!

Taken together, the intelligibility, the palpable imaging under-pinned by that deep bass and, finally, the sheer sense of life all adds up to a speaker which convinces. In the theatre they talk about the willing suspension of disbelief, the crossing of the bridge so that you believe in the characters on the stage, their lives and their emotions. For recorded music, the 105/3 shortens that bridge, and with the best recordings it all but demolishes it! That's what makes it a *great* loudspeaker.

Conclusion

How can you sum up such a prodigious breakthrough? Owing more to the likes of the big *Infinity's*, the *9 Kappa*, *IRS Gamma* and *Delta*, and offering the neutrality and coherence of the better dipoles, the 105/3 constantly begs comparison with much more expensive products. It trounced KEF's own 107 at a considerable cost saving, forcing a major revision of the flagship model. Like every good middleweight boxer, it offers a near perfect blend of power, speed and finesse. Balance is its secret, not doing anything badly, and doing the important things well.

A wide open window into the state and character of your system, the £1,850 105/3 is without peer as a set up tool. If it sounds bad, look at the room, look at the equipment, but don't blame the speaker.

Roy Gregory

First published in *Hi-Fi Choice* May 1990

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Koetsu *Urushi*

Absolute Sounds Ltd., 58 Durham Road, London SW20 0DE. Tel: (081) 947 5047

Analogue's strongest supporters inhabit the high-end, so the appearance of new (and expensive) cartridges continues well into the digital age. Koetsu, doyen of the upmarket cartridge makers, has followed last year's 80th Anniversary model with another exotic device which proves yet again that there's still more lurking in the grooves for us to discover.

If hi-fi products can be described as 'beautiful', then the *Urushi* is probably the most beautiful cartridge ever seen. The unusual finish rather than the body shape provides the cartridge with its unique appearance and its name - 'urushi' is a lacquer made from the sap of a Japanese tree called urushi. The body is made from solid aluminium in the standard Koetsu slab-sided rectangle. The hand-painted splatters of rust, gold, red and copper give each cartridge an individual look, not harming one bit the *Urushi*'s appeal amongst the carriage trade. Urushi lacquer also has a virtue other than aesthetic, in that it hardens with age, increasing the strength of the body and eliminating whatever traces of resonance might remain.

Although not the top model in the Koetsu line - that title belongs to the new *Reference* - the *Urushi* features a Boron cantilever and fineline stylus as found in the earlier *Signature* models. The motor now incorporates materials regarded as the state of the art for moving-coil cartridge design in Japan, so it might be regarded as the first of a new generation. The most important new ingredient is a platinum-core magnet, a material employed not just for magnetic strength but for control of eddy currents and overall behaviour. Also featured are iron in the magnet of '3N' purity (99.999%) and ultra-high purity copper throughout.

Set-up is absolutely straightforward because of the parallel sides and flat front and top plate, traditional features which make Koetsus among the easiest of all cartridges to install. A weight of 12g, though, may require the use of auxiliary weights with some tonearms. VTA is established correctly with the top of the body absolutely parallel to the LP. A

tracking force of 1.8g proved to be the best setting for both sound and tracing/tracking ability, while output is high enough to allow for direct insertion into a 47kohm phono input.

Sound Quality

One aspect of the *Urushi*'s performance is enough to place it above its brethren and the competition, a quality so strong that it will sway listeners who need proof that analogue can still embarrass digital. Beyond doubt, the bass performance of the *Urushi* is unrivalled for richness, extension and a perfect balance between control and decay. It is inadequacy with the latter which identifies digital bass: overdamped and with unnatural ambience and harmonics. The *Urushi*'s bottom octaves - and this revelation is best experienced for the first time with acoustic bass recordings - convey the harmonic structure and the rhythmic patterns with absolute authenticity.

A highly desirable by-product is the way that the Koetsu separates layers of sound wherein a number of instruments are competing for prominence in the bottom octaves. Any confusion manifested by hyperactive bass, drumming, guitar and/or synthesizers is rendered insignificant, the various sounds being easier to decipher and therefore to follow; the result is a more cohesive, supportive foundation for the midband and treble.

The rock-solid, three-dimensional nature of the lowest registers remained consistent up through the frequency spectrum. Imaging benefited because this kind of performance results in pinpoint image placement and a sense of width, depth and height often compromised by lesser designs. While many studio recordings, with artificially derived spatial

contrasts, can be used to verify this claim, it's best to audition the *Urushi* with live recordings using sensible microphone arrays, including a number of LPs from Sheffield Lab and Reference Recordings. The recreation of space - all aspects of it - is another *Urushi* speciality.

Koetsu veterans will recognise the midband, a happy blend of detail and transparency, but with the kind of warmth



associated with valve electronics. The transition from the still-magnificent *Red Signature* is therefore an easy one for those wishing to upgrade. What the *Red Signature* user will find shocking, however, is the far greater authority at the frequency extremes. In this respect, the *Red Signature* is more like the 'classic' Koetsu, a prime example of the traditional sound of those wooden-bodied wonders. The *Urushi* gives you all of that and a bit more.

Conclusion

Do people still buy cartridges selling for £1,612 including VAT? Considering that you may have to wait for your *Urushi* unless you can find a dealer with one in stock, it's safe to assume that demand is outstripping supply. And considering that two of the reviewers for *The Collection* keep *Urushis* among their reference cartridges, you can also assume that a firm Recommended rating is in order.

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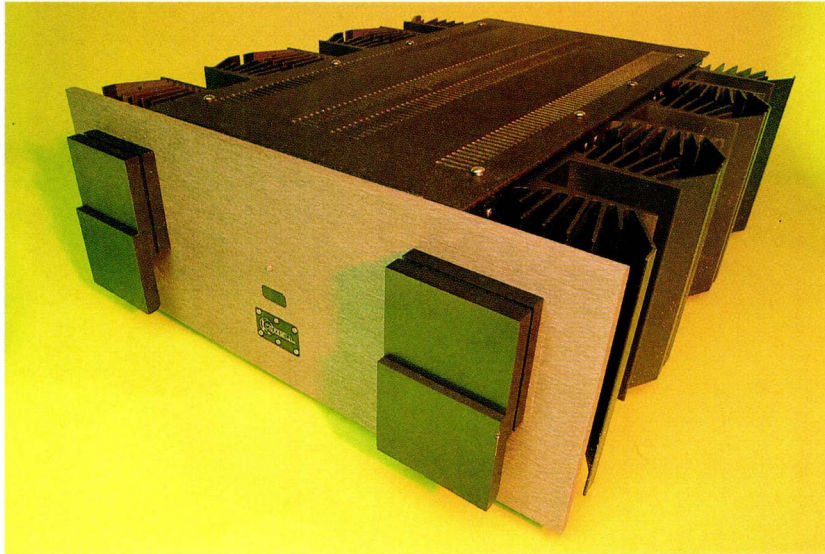
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Power Amplifier

Krell KSA-250

Absolute Sounds Ltd., 58 Durham Road,
SW20 0DE. Tel: (081) 947 5047

A late addition to the present KSA range of Class A power amplifiers, the KSA-250 came about almost by accident. As conceived, the range began with the KSA-80 followed by the '200, each then convertible and/or available as mono blocks, known respectively as the KMA-160 and the KMA-400. While the '80 and the '160 were successful, and the performance of the '200 was exemplary, it suffered some reliability problems associated with its physical design and concerning heat and electronic stability. Accordingly, a programme was started to simplify and better organise the construction of the KSA-200 and, in particular, to reduce the amount of internal wiring, long a feature of the Krell Class A series. The result is the so called 'wireless' (or nearly so)



Krell KSA-250, uprated to 250W per channel and now replacing the '200. Some troublesome 200 units have in fact been exchanged for the '250.

Excellent speaker load tolerance is a specific feature of the Krell KSA-250. Of considerable depth, with external heatsinking running down the sides of the case, it runs silently without the need for fan cooling but it also runs hot and requires adequate free flow ventilation. It will also warm up your listening room with around 1kW of standing dissipation.

The outputs are from large pairs of gold-plated binding posts and aid in loudspeaker bi-wiring, while the audio inputs are all gold-plated, both phono and XLR, balanced and unbalanced termination. Mains input is via an IEC detachable 3 pin cord and heavy gauge mains cable is recommended and supplied to avoid any loss of power or dynamics.

Sound Quality

For the test, the available references included a Krell KSA-80B and the ARC CL 120. The amp was used with moving coil speakers and ribbons, notably in bi-wired mode with the Apogee *Duetta Signatures* and the Apogee *Stage*. Signal sources included the Krell MD-1/64X CD player plus the Meridian 602/603 combination for digital, while my Goldmund *Studio/T4/* Koetsu *Red Signature* combination

replayed selected recordings on vinyl.

Unmistakeably, the KSA-250 is a Krell, warming up relatively quickly over the first hour and proving itself to be a thoroughbred. Significantly improved over the already remarkable KSA-200, the '250 gave an immediate sense of rightness. Power was available in magnificent abundance, never overplayed and delivered with a consistently high ability over the entire audible dynamic range. The '250 can get as loud as you could wish for, and did not harden up at high levels.

Essentially neutral, this amplifier has a slightly cool, restrained temperament, never sounding brash or excitable. Yet those and other aspects in the music are readily communicated, such is the very high resolution and clarity of this design. Stereo focus is first rate, while stage width is very good. Fine impressions of stage depth are possible, although there is a characteristic hint of dryness towards the back of the perceived sound stage.

Highly controlled, the treble is a major feature, virtually grainless, and strong on fine detail as well as transient fidelity. Krells are famed for their bass and the KSA-250 does not let the side down. As Ken Kessler might put it, compared with ordinary amplifiers the Krell 250 bass is awesome. It defines the present art in many areas - slam, depth, articulation and sheer foundation.

The '250 is one of the world's finest,

managing to capture much of the virtue of the delightful KMA-160 and the outright authority of the Reference series. Consistency is a key virtue: the high standard is maintained over a wide variety of loadings and power levels.

Conclusion

In previous reviews of the present Krell series, I placed these amplifiers at

the forefront in terms of sound quality alone. The new KSA-250 is a worthy member of the range, with a sound quality which fully justifies its price and position. Indeed, it remains a difficult task to find sources and preamplifiers of sufficient quality to do it justice. With almost boundless power, ultimate load tolerance, excellent build and superb finish, it actually represents substantially good value in the rarified and specialist audiophile amplifier market.

Offering great neutrality, it does not significantly betray its solid state design and this may be used in a wide variety of systems using mixed technologies. Such universal application is rare indeed, and makes it very easy to provide a strong recommendation for the product. Is there really any need to go further than this?

Martin Colloms

GENERAL DATA

Rated output:	Class A, 250+250w, 8ohms
Max programme power:	approx. 325+325w, 8ohms
Output, 4ohms:	Class A/B, 500+500W
Output, 2ohms, short term:	Class A/B, 1,000+1,000W
Output 0.5ohms:	Class A/B, 4,000+4000W
Distortion:	typically below -80dB
Load tolerance:	excellent
Standing power consumption:	1kW approx. 20 to 40 min warmup
Dimensions (w x h x d):	50 x 22 x 61cm
Weight:	65kg/141lb
Inputs:	balanced and unbalanced
Outputs:	3 way binding posts, bi-wire
Price:	£5,748

Audiophile CD systems are finding their place in the high end market as analogue disc separates continue their slow decline. A rash of decoders and, more recently, CD transports are at last appearing on the scene and it seems everyone wants to get in on the act. Well known for finely crafted high-end amplifiers, many of which have acquired top review ratings over the years, Krell has recently set up a division entirely

vibration and acoustic coupling and certainly looks the part. The aura of a high-end turntable is successfully conveyed. Physically, the transport is derived from a top end Krell preamp while an ingenious internal system forms a concealed high mass sub chassis and a sprung suspension system. The four black knobs provide for some levelling, should this be required.

Just a few basic control buttons are provided on the transport, while the utilitarian Krell-made remote handset does not really look the part and in any case only adds 'pause'. No numeric key array is provided, reinforcing the audiophile 'manual play' character. Optical and wired digital signals may be sent by the *MD-1* and received by the *64X*.

Briefly covering the transport

interface input. The audio output is DC-coupled, and the analogue circuitry following the DAC is to Krell's best discrete component practice.

Lab Report

Lab tests for the transport confirmed a good level of disc error protection, and an excellent immunity to external vibration as well as acoustic feedback. In addition, it resisted mechanical shock very well.

Some mild motor noise could be heard from the transport under quiet conditions. The *'64X* showed linearity very close to a theoretical 16bit performance, with a very good signal-to-noise ratio and excellent low level resolution. Interestingly, the frequency response was very flat over the bulk of the

whole range but rolled off at 15kHz to almost -4dB at 20kHz. The treble, however, did not sound dulled, and I suspect that this may be due to the relatively high level of unfiltered spurious signals above 20kHz, which under some test conditions, were just 8dB below the chosen test tone. This might be associated with the strongly 'zingy' treble sound and some mild variation in quality observed with other amplifiers, perhaps a result of their behaviour in the presence of such ultrasonic spurious signals.

As regards other aspects of its performance, the distortion levels were moderate, channel separation fine and the output was absolute-phase correct, nearly spot on at 1.95v and sourced from a standard 315ohms output impedance.

Sound Quality

With the production *MD-1* showing an improvement in sweetness over the pre-production units, the combination was heard to improve in clarity and poise over

Krell MD-1/SBP-64X

Absolute Sounds Ltd., 58 Durham Road, London
SW20 0DE. Tel: (081) 947 5047

devoted to digital audio, called appropriately enough, 'Krell Digital Inc'. The company specialises in the design and production of source components in the CD field. The first statement products are the *MD-1* transport and the *SBP-64X* decoder, the pair forming a three box CD player at a premium audiophile price of £15,689. A more moderately priced transport is also underway, while the decoder line has now expanded downwards from the £9,900 *'64X* to the *'32X* at £3,288.

As with all Krells, the units were beautifully presented in a combination of textured black enamel and black satin anodising, the casework complemented by thick, solid aluminium front panels, the latter in silver grey. As for the *MD-1*, its distinctive and unmistakable appearance derives from its use of a manual, top-loading CD mechanism, with a gold plated centre clamp, the whole protected by a massive faceted acrylic lid. Carved from the solid, this lid minimises

technology, this employs a high precision Philips drive, the die-cast *CDM3*, with glass optics and a powerful direct-drive Hall-effect motor. Inside, much of the servo and microprocessor design emanates directly from established Philips practice.

As for the *64x*, it is distinguished by a massive separate box power supply as is the practice with many high end preamps. The main unit has no facilities, except for a few indications to confirm the presence of a digital signal and locking.

Krell recommends the wired connection, resorting to optical mode only when muting occurs in the presence of unavoidable electrical interference.

Krell uses its own signal processing technique in the digital domain, using 56 bit DIP chips and an oversampling/ filtering code held in ROM and available for a future upgrade. The final sampling rate is a high 64x feeding a Burr Brown *PCM64* multi-bit DAC, one per channel chosen for their high speed, parallel



a running-in period of several days. With the performance stabilised, it fell very naturally into a high-end system, comprising Krell bi-amped *KSA-80Bs* driving Apogee *Duetta Signatures* via a Krell *KSP-7B* preamplifier. A passive, hard-wired pot provided an even closer approach to a direct connection from CD decoder to power amplifier.

While other high performance decoders have become available and in some areas compare favourably with the '64X, it has to be said that the top end Krell combination performs right at the limits of the state of the art in several fundamental areas. In the Krell tradition, it sounds very well founded, confident, stable and authoritative. This effect is conveyed by first-rate stereo focus of near-holographic dimensionality and a deep, solid and powerful bass. Many other pretenders to the CD throne sound anaemic and flashy by comparison. A further key aspect is this unit's ability to deliver a high degree of expression, liveliness if you like, coupled with strong dynamics. In these areas, the *MD1*/'64X strikes closer to the original source, despite a mild trace of mid hardness and of similarly light but audible treble exuberance.

If perceptibly 'zingy', it remains hard to fault the treble. It is superbly detailed, harmonically true and blending beautifully with the lively 'open' midrange. The sound is consistently uniform over the whole audio bandwidth. Both stage width and perspectives were excellently defined and the replay also shows very good depth, just held back from a known expectation of excellence.

The sound drove along with a good feeling of involvement and this did set the combination in an area where many other systems sound a bit slow and quiet, rather muted and too restrained.

Conclusions

Here we have one of the world's finest CD replay systems. Indeed, in matters such as bass slam, dynamic power and general authority, it is pre-eminent at present. It offers remarkable focus and clarity with a lively, involving presentation, uncommon with much CD replay.

Yet some flaws were apparent, for example, the ultrasonic spurious noted on test and the slightly premature treble roll-off. Tonally, it is a touch lean, though good system matching and balancing should take care of this. When you are buying the best, it is hard to take a sensible

Beautiful presentation and fine sounds from the experts at Krell.

view of price. With this CD player, you will be in no doubt concerning the excellent finish and build, the maker's high reputation and last, but by no means least, the fine sound quality.

Martin Colloms

TEST RESULTS

MD-1	
Error correction	2mm gap
Track access	3.5 seconds, typically
Mechanical noise	moderate spindle motor whine
Shock/vibration	excellent rese
Acoustic feedback	excellent
Digital outputs	Toslink optical + phono coaxial
Price	£5,789

64x	
Channel separation	90dB typically
Channel balance	excellent
Full level distortion	-73dB
Full level intermodulation	-71dB
Signal/noise unweighted	108dB
De-emphasis	accurate
Error at -90dB	-2dB average
Frequency response	DC flat to 15kHz, -4dB to 20kHz
Output	linear phase impulse, absolute phase correct
Price	£9,900

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Marantz CD-11 PDM

Marantz Hi-Fi (UK) Ltd., Kingsbridge House, Padbury Oaks, 575-583 Bath Road, Longford, Middlesex UB7 0EH. Tel: (0753) 680 868

Marantz's CD-11 one-bit player heads a range still dominated by 16-bit technology. Its die-cast fascia, matt champagne gold finish and discrete fluorescent displays are all reminiscent of its sister company's -ie, Philips' LHH one-bit players as, indeed, is much of the digital circuitry. A chunky die-cast CDM-4 mechanism helps with the high-end image as do the optional balanced XLR outputs.

Marantz has eschewed the conventional 'BitStream' logo in favour of one reading 'Class A DAC'. Justifying this, Marantz liken the absence of zero-cross distortion in the PDM DAC with the similarly unperturbed characteristics of a Class A amplifier.

In reality, and in common with most front-line PDM players, the CD-11 is equipped with two standard SAA7321 DACs configured to operate in differential mode. This technique suppresses common-mode noise, improving the S/N and linearity of the system while reducing even-order distortions.

On test, however, the CD-11 did not yield state-of-the-art results as far as linearity, distortion or S/N were concerned! Ho-hum. Undeterred, Marantz has even included a standard SAA7220P/B 4x oversampling filter which, though it plays no active role in the PDM process, does provide a digital output.

Differences do exist, however, between this and other PDM CD players in the way the 16-bit datastream is re-formatted prior to upsampling, truncation and conversion. Here Marantz has opted for a complex series of 8-bit shift registers mounted ahead of the DACs, these performing the data inversion and delay necessary for differential operation.

Digits aside, the CD-11 is scantily-equipped, offering on-board facilities for basic transport, FTS memory and repeat options. Fortunately, there's also a matching RC-11 CD handset that bolsters



the feature-count with direct track access, index skipping, random access memory and a 10-second intro-scan. You can also defeat the two small displays though these are fairly conservative affairs that contribute very little interference. Besides, there are more significant gremlins at work within the CD-11.

Sound Quality

So it was with bated breath that, after many months of waiting, I sat back to bathe in the glorious sound of Marantz's first pukka PDM CD player. Things went well at first, the player developing a broad and spacious acoustic. But there was a lack of very deep bass, a thinning of the infrasonic 'rumble' that adds weight and substance to the grandiose presence of an orchestra in full flight.

On a strictly superficial level everything seemed in order. Vocals were centrally focused and suitably articulate, bass not over-weighty but still tuneful. Yet beyond all this was a subliminal busyness, a mild 'grunge' that detracted from the smooth acoustic expected of a PDM player. This muddling was linked to other colorations that grew in subjective importance the longer I listened to the player. Unusually, for a PDM-based player, the CD-11 began to sound fatiguing. Specifically, the treble developed a mildly splashy quality which

soon began to grate on my nerves. When playing the intro to Peter Gabriel's *Don't Give Up*, the treble took on an aggressive, icy coloration that had me reaching for the volume control.

I know of no other PDM-based player that coarsens in such a fashion. Indeed most sound very consistent from one piece of music to another.

Conclusions

If the CD-11 is an example of what Marantz expects from a PDM-based CD player then this throws some light on the well-publicised reluctance of its top designers to embrace the technology. Perhaps its digital re-formatting circuitry is too complex for its own good or, alternatively, its failings may originate with the ensuing analogue stages.

Either way far superior players are available using the same SAA7321 DACs, so this result cannot be taken as an indictment of the technology itself. Back to the drawing board guys.

Paul Miller

GENERAL DATA

Laser:	single beam, 780nm
D/A converter:	1-bit differential PDM, 256x
Rated output:	2V @ 100ohm (unbalanced) 3V @ 100ohm (balanced)
Dimensions (w x h x d):	454x122x132mm
Price:	£2,000

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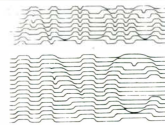
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Martin-Logan *Sequel II*

Absolute Sounds Ltd., 58 Durham Road, London SW20 0DE. Tel: (081) 947 5047

The original *Sequel*, introduced in late '87, had an electrostatic diaphragm covering most of the audio frequency band, crossing over to a bass reflex moving coil subwoofer (or what amounted to a subwoofer) in the base of the system. For *Mk II* status, bass alignment has been changed to IB (sealed) in the current model for its superior phase performance and improved integration with the electrostatic panel.

Another change which actually happened just before the *II* was announced, was a switch from a burnished carbon based diaphragm coating to one based on vapour deposited copper and palladium. The new technology means improved consistency and a reduction in the hygroscopic nature of the diaphragm that made early M-Ls so variable. Treble extension and quality are also said to have been improved.

The resistivity of the panel is set at 1 gigaohm/sq cm (10⁹Ω), which effectively inhibits charge migration and, uniquely, allows the panels to be used safely with no dust sheets or separate insulation. The diaphragm is also extremely light, and this suggests at least the possibility of good transient response. The panel operates in push-pull between two charged plates which are fully insulated, and this allows them to be overdriven without risk of amplifier damage. Comparison with other electrostatics is, to put it mildly, instructive.

A key problem with panel loudspeakers is dispersion. Where, for example, Quad uses delay lines feeding annular diaphragm elements to simulate a point source, most other companies use flat panels which radiate in a figure-of-eight pattern, with consequent sharp beaming of mid and treble output. Martin-Logan reduces beaming by curving the electrostatic element so that it radiates into a horizontal arc of about 30 degrees.

Vertical dispersion remains very low, and acoustic interaction with floor and ceiling is therefore minimal. Like all dipoles, the *Sequel II* must be used well away from walls, but even very small variations in positioning and minute toe-in changes can effect the sound well into the midband. Listening height is also an important variable, and just to complete the picture, spectral balance and midband

integration are affected by listening distance.

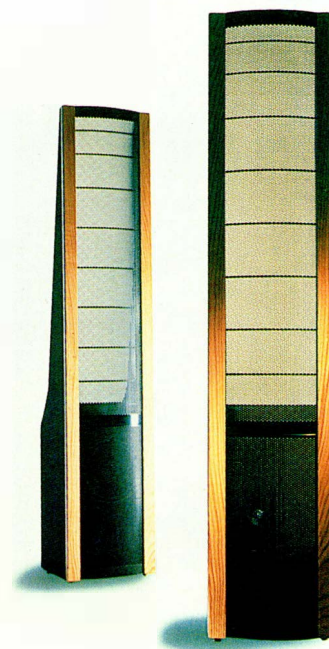
The *Sequel II*, which has a statuesque quality as close to beauty as any recent hi-fi, is superbly built and presented in real wood veneers. The *Sequel*'s footprint is small, and the transparent curved diaphragm reduces visual intrusion. The speakers should be permanently powered (electricity consumption is negligible), and bi-wiring is recommended. A bass contour switch is available to vary system balance; I used the speakers with the response nominally flat, ie, bass full on, and ran them in for several days before serious listening commenced.

Sound Quality

I have not previously been impressed by Martin-Logan's attempts to marry ELS panels with enclosed moving coil drivers which are inevitably slower and which radiate in different ways. But I was impressed by the *Sequel II*, whose integration was better than I had previously experienced from this marque. The bass sounded crisp and well extended, but extremely dry, matching the ELS dominated mid and treble well. There was no hiding a certain unevenness in the way fundamentals in the octave or so around 250Hz were reproduced, the practical consequences of which included a lack of weight and sonority in the reproduction of tonal colours of many instruments, woodwind, piano and the larger members of the string family.

The second and abiding impression is of the incredible performance of that electrostatic panel, which must surely be the best of its type. It is astonishingly quick and concise. It swings bucket-loads of decibels with abandon, and without the slightest suggestion of holding back even at levels which defeat many dynamic systems. There is never the faintest suggestion of overhang, nor of conventional colorations, and the seamlessness of the panel is reflected in an utterly homogeneous quality outside the bass. And there's a level of detail that approaches what can be experienced, say, with Stax *Lambda* headphones.

Stereo soundstaging benefits in coherence from the lack of clutter and



overhang, and from a very slightly compacted version of the big image scale that is part and parcel of all good panel loudspeakers. The only remaining minus point is a slight hardness, noticeable in the reproduction of female voice and elsewhere, which might have gone unnoticed had it not been for the *Sequel II*'s otherwise outstanding transparency.

Conclusions

Even in larger rooms, for which the *Sequel II* is best suited, setting-up demands meticulous care. It is something of an amplifier crusher too - it definitely didn't sound quite right with some of the amps I had laying around, and the bass can sound a little thin and disembodied in certain situations. The good points far outweigh these minor peccadilloes however, and the midband and treble are as fast, assured and detailed as any loudspeaker at almost any price.

Alvin Gold

GENERAL DATA

System frequency response:	28Hz-24kHz +/-2dB
Crossover frequency:	250Hz
Sensitivity:	89dB/watt/mtr
Power handling:	200wpc
Recommended amplifier power:	80 - 200wpc
Impedance:	nominal 8ohm, min. 2ohm
Weight:	50kg each
Dimensions (w x h x d):	36 x 180 x 33cm
Price:	£2,897

Meridian 602/603

Meridian Audio Ltd., 13 Clifton Road, Huntingdon, Cambs.
PE18 7EJ. Tel: (0480) 434334

It seems an age ago that the last *Hi-Fi Choice Collection* hit the news-stands. In the intervening period, high-end has produced a plethora of products. But has compact disc really become a true audiophile medium? 'Bitstream' (Philips' version of low-bit digital to analogue conversion) has 'arrived', and all manner of claims have been made. Some are true, but many have led to heated debate. Meridian, however, has decided to take the bitstream route and has, in my opinion, been at the forefront of this particular technology. It's the major reason why low-bit has really taken off.

Recently, the company has made a good deal of progress with digital products in general, including loudspeakers as well as CD players and digital converters. Eighteen months or so ago in *The Collection*, it was the 207, using Philips 16-bit technology, which I found more than competitive with the high-end players around at the time. Since then, a progression of products has led to this latest descendant of 207 - the 602/603. While the 602/603 together have the same function, they are not replacements for the 207, as this task falls on the 208 (a bitstream 207).

The 208 was one of the high points of the past year - it delivered an infinitely more civilised performance than almost everything else for less than the price of a second-hand Skoda (or a new one for that matter). The 208 was followed by the 203, a digital processor which offered even better performance than the 208, but transport-dependent. Also launched by Meridian were loudspeakers which could take a digital input from a transport (either via a coaxial or optical link) as they have a decoder and amplification in each speaker. Even more recent is a speaker in the 600 range with a crossover in the digital domain - even more digits required. This route of digitally receptive equipment only requires a CD transport, so there's

no point in having a full CD player. Thus Meridian has gone the obvious route by designing a separate transport for the 600 line. And while you're designing a top transport, why not make a converter to go with it? And so the 600 series spawned a transport and converter.

One of the reasons why the 208 and its siblings worked so well was the adaptive technology used to produce differential mode operation. This means that two DACs are required for each channel; by employing shift registers to delay sections of code, one chip can be used for left and one for right channel. Philips seemed impressed by this system and has included it in the latest bitstream DAC called the BS DAC (standing for 'Bitstream', not 'Boothroyd/Stuart'). It's designated the SAA7350 and has four bitstream converters operating in true differential mode and using third-order noise shaping.

An obvious vehicle

From Meridian's point of view, the obvious vehicle for the BS DAC was the new 600 series. Whereas the original bitstream DAC had a digital filter built in, the latest incarnation allows the use of various separate digital filters - presumably so the Japanese will want to buy it to use with their 18 and 20-bit digital filters. Interestingly, the 603 uses a digital filter in the ordinary bitstream chip. Internally, it has benefited from the gestation of the prior Meridian range and it uses hi-tech four layer boards and optimised layout. The two-box design ensures good isolation. The volume control is a 64-step discrete FET controlled amplifier with high performance, specially selected operational amplifiers. The digital input automatically locks on any digital signal between 32kHz and 48kHz and a special PLL oscillator and control loop are housed in a separate screen can. Eight separate power supplies are employed. The digital input can either be via coax or

optical with a special high speed optical receiver employed.

While the new 600 components are a top-of-the-line series in what is hardly a cheap range of hi-fi, in terms of the high-end in which it competes it is not overly expensive. Styling and finish are better than Meridian's usual efforts. The products have polished hard black anodised cases with real glass fronts. Following on the familiar theme, the 602/603 combination uses two two-box units, bolted together with finely finished extrusions.

The front panel has a minimum number of controls to facilitate basic operation; it bears the Meridian logo in gold behind the smoked glass panel and all gold-plated soft touch bars, which protrude through slots in the front panel, are hinged at the bottom. The display uses a comprehensive dot-matrix array with full message annotation and fine readability. The 602 is a CD transport with both twin optical and twin coaxial outputs. It interfaces with the 603 via the inter-product connection (comms) which is compatible with other Meridian components.

Each operation is denoted by back-lit legends and display responses. The eight source keys on the 209, which is a versatile and rather heavy remote control which provides total access of all functions, include a phase invert facility. Each input can have assigned to it what Meridian calls a Logogram (CD, Radio, etc) which is displayed when that input is selected. Extra facilities are available via the comprehensive remote control. Selecting CD will route the player through the variable output. Out of the fixed outputs, it's just like a CD player and out of the variable ones the converter works like a separate source for the preamplifier.

The 602 transport uses a fast response CDM4 which is fixed to a Meridian magnesium die-casting for added rigidity. It features two-box construction with one box containing the CD mechanism, power supplies and servos, while the other contains the digital and display circuits. All the latest Philips control chips are used and the master oscillator is screened; it sports a new high precision circuit. There is a user adjustable settle time as well on track-seek, allowing a variety of out-board processors to lock reliably. The front panel controls cover open, play, stop, pause,



CD Meridian-style: better than vinyl?

out, depth especially was enhanced and the images gained extra solidity. Although I still detected a trace of upper midrange hardness it was not annoying, but it did accentuate that frequency band. The treble was just a touch untidy and the bass was still a little soft. Even in this guise, bitstream still seems to lose some dynamic impetus and grip on the overall performance. The result is that the members of the band don't quite play together - better than most CD players but not good enough to usurp vinyl. The transport was found to be the best yet tried, with excellent definition and information retrieval, especially in the midrange.

Lack of space precludes a detailed summary of lab performance but I examined the unit in the laboratory and found it to perform exceptionally well on all counts.

Conclusion

Although the 602/603 combination is not really designed to operate as a standalone CD player (each unit costs £1,500), the resulting sound from the fixed output, when connected as described, is the best I have come across from any available CD player. Also, I consider both boxes to be the best of their type. On these grounds alone the two units are worth recommending. If you compared vinyl with CD using this preamplifier, you would find that CD Meridian-style really is better than vinyl - but then that's only one instance.

When finish, aesthetics and general design are taken into account, the package looks even more promising, although I can't help feeling a little disappointed that the preamp wasn't more transparent and my partiality for vinyl means that a better phono stage is really a must. For myself I have answered the question: CD has not yet come of age, although this is the best transport, digital processor and complete CD player I have yet encountered.

Chris Bryant

next and previous tracks.

There are some changes in the control functions if compared with the normal Philips based CD players. When play is pushed, the current track is replayed from the start; on the Meridian you jump to the next track. However, single key track entry enables quick track access - an improvement over the 207.

Sound Quality

Designers, Boothroyd & Stuart do not really take vinyl that seriously any more, as the company majors on digital sound sources, so it will come as no surprise that the disc stage isn't really that good. Set up for moving coil gain as mine was (it's switchable to moving magnet inside) and fed by my normal Linn set-up, it didn't really deliver the goods. OK, I was undoubtedly spoiled by having what I consider to be one of the very best preamplifiers in the world at any price, in the Conrad-Johnson PF1, but I did also compare it to lesser models. It does not throw depth, create space, boogie or generally keep you listening. It's up-front, a touch grainy and forced and it lacks body and soundstage solidity. It throws away detail and sounds totally off the beat-out of time. Joni Mitchell for instance (on any of her albums) didn't bounce but sounded repressed.

The 603 is a preamplifier and although it has fixed CD outputs which come straight off the DAC as it were, it seems reasonable to assume that it will be used mainly in preamp mode. Initially, the CD player was assessed from the variable output. Operating in this fashion, the preamp proved itself to be well up with most of its peers, but it's not exactly perfect. Compared with the fixed outputs fed through a passive potentiometer or top quality line stages, into Krell and Musical Fidelity power amplifiers, the Meridian shed some detail. The bass dynamics were softer, transients blurred and images were moved closer. That is to say that with the best, sharp images are formed of singers and instruments within a sound stage; with this one you move closer to the stage so that the performers grow in size but they are also a little fuzzier, lacking a little body and realism. In saying this, I must support the fact that voices of both male and female performers are still well articulated and with good enunciation, but dynamics are a little compressed. The sound stage itself has good dimensionality - rather better than the 208, in fact, but then you would expect that.

Ifed the fixed output through a 50kohm Alps volume control to my power amplifiers and it was in this mode that the unit delivered its best. The stage spread

Michaelson Audio *Chronos*

Musical Fidelity Ltd., Unit 16, Olympic
Trading Estate, Fulton Road, Wembley,
Middsx HA9 0ND. Tel: (081) 900 2866

I hope you don't think it's *too wacky*", said designer Antony Michaelson when I used the term to describe the look of his latest creation.

He'd taken my comment the wrong way. I hadn't meant to be disparaging; I'd meant 'wacky' in the sense of being visually bold, daring, and. . . well, different.

And it takes but a glimpse of these brand new Michaelson Audio *Chronos* amplifiers to appreciate that the design is indeed a bold statement. Hi-fi products need not all look the same, as Michaelson has already proved over recent years in producing amplifiers such as his Musical Fidelity *A1* integrated. But this time he's 'gone for broke' in creating something quite out of the ordinary. The sculpted casework, which borrows heavily from the Art Deco tradition, makes the *Chronos* amplifier system look not unlike something you might expect to find decorating the set of a Fritz Lang movie. To these eyes it's magnificent, though doubtless to some others it will be repulsive. That's what makes it so daring.

To keep it quite separate from the more traditional (and more affordable) Musical Fidelity solid-state product line, these up-market valve amplifiers - of which there will doubtless be other models in the future - are the products of a newly-formed American company: Michaelson Audio.

While the *Chronos* pre/power combo loaned to *Choice* for auditioning was a production prototype manufactured in the UK, by the time this *Collection* is published the first components should be rolling off the American production lines in Bridgeport, New Jersey. (For overseas readers, Michaelson Audio Inc's telephone number is 609 467 5588.)

Chronos is a four box amplifier system: two 100W monoblok power amplifiers, preamplifier, and massive preamp power supply. The latter powers the preamp via a one-way umbilical cord fitted with lockable male and female XLR connectors. Much of the space within the preamp box is dedicated to the phono stage, which is superbly quiet for a tube preamp, with plenty of gain for most moving coil cartridges (300mV or more). Eight valves are employed in the preamp, while the power supply uses advanced transistor regulation techniques to ensure "almost undetectable" power supply noise on both the high and low-tension circuits. There is separate HT regulation for each stage of each channel, and each channel has separately regulated LT.

In addition to the phono input, there is one tape monitor loop and a further five line inputs labelled CD, tuner, tape 2, Aux and CD-V (!). Only one pair of output sockets is provided, which might prove annoying should anyone feel the urgency



to bi-amplify a system with two pairs of *Chronos* monobloks! To the left of the centrally positioned volume knob is a balance control and, to the left of that, a 10dBV cut switch - which might prove useful for users of high output cartridges. And for those impressed by pretty lightshows, switching on the power activates a row of three LEDs on the preamp fascia which go through a coloured sequence from red thru' amber to green as the LT and HT circuits stabilise and the preamp reaches 'all systems go'.

The *Chronos* monoblok power amplifier uses eight output tubes, while the design of the power supply and output transformer allows for high peak current delivery. Extremely low levels of interstage and local feedback are used, and no overall feedback is used whatsoever.

Sound Quality

From the opening bars of the music you can hear that the *Chronos* is in the top league. There's that sense of ease and spaciousness which is so characteristic of high quality valve amplifiers, a



The Chronos amps: visually daring and rather special.

Antony Michaelson admitted to being nervous about it. After all, he'd invested a considerable fortune - in excess of £350,000 - in research and development, and tooling costs for casting the sculpted metalwork. And he'd been wanting to build a 'killer' tube amp ever since the heady days of the classic Michaelson & Austin valve amplifiers of the Seventies (still cherished by many listeners). The £10,000 *Chronos* amplifier had been many years in the making. Suppose nobody liked it! What if dealers and overseas distributors wrinkled their noses and declined to open their order books?

While any last-minute rush of self-doubt was understandable given the circumstances, he need not have worried. The Michaelson Audio *Chronos* was the star of the exhibition - and sales targets for 1991 have already been exceeded. At this price level it's unlikely that very many sets will find their way

naturalness and 'flow' which to my ears eludes even the finest solid state designs. The *Chronos* 'breathes' - especially in the lower registers - and possesses a delightful transparency through the midrange which renders vocals with a clarity equalled by only a handful of state-of-the-art amplifiers in my experience.

While much of the combo's finesse is attributable to the preamplifier (on its CD and phono inputs alike), its subtleties remain uncorrupted by the monoblok power amplifiers. Having experimented with a few other preamps over a couple of evenings - models as diverse as the Conrad-Johnson *Premier Seven-A* and EC Audio *Finestra* - I satisfied myself that the power amps, like most thoroughbreds, are transparent to the source feeding them. The *Chronos* monoblok sound sure-footed and powerful, with truly fantastic headroom. While they're not going to drive Apogee *Scintillas* in the manner of a giant Krell power station, with more sensible loudspeaker loads the *Chronos* power amps can swing dynamics which will take your breath away. I spent an enjoyable evening moving air with a pair

of KEF 105/3s; an even more enlightening few evenings entertaining several visitors (and, I suspect, several of my neighbours, too) driving a pair of massive Townshend *Sir Galahad* loudspeakers to absurd sound pressure levels. With Mahler and Led Zeppelin alike, the power amplifiers proved unflappable, setting up a wide and deep soundstage which took us as close to 'being there' as the limitations of the listening room and the recordings are ever likely to allow. We had a lot of fun.

While the preamplifier and power amplifiers will work well in 'mix 'n' match' systems - even with transistorised partners - it's as the '*Chronos* quartet' that the musical performance really comes together best. Both in timing and tonal evenness, the pre/power combo hangs together beautifully to create a solid foundation which is musically satisfying. Best of all, it never draws attention to itself.

Conclusion

Prior to the launch of the *Chronos* pre/power combination at 1990's Heathrow Penta hi-fi show in September this year,

into UK homes, but for those who aspire to something rather special, the *Chronos* is in the top class in the sound quality stakes. And if your home decor can handle it, the striking visual design will be welcomed as a refreshing departure from normal run-of-the-mill rack-mount high-end products.

John Bamford

GENERAL DATA

Preamplifier	
Input sensitivity (phono):	4mV / 1mV
Input sensitivity (line):	440mV / 125mV
Signal-to-noise (phono):	-80dB
Signal-to-noise (line):	-94dB
Phono overload margin:	>35dB
Size (w x h x d):	
Preamp:	485 x 90 x 415mm
Power supply:	485 x 90 x 415mm
Preamp:	12kg
Power supply:	12kg
Price:	£4,700 (set)

Mono power amplifier	
Input sensitivity:	1V
Output power:	112W
Bandwidth:	10Hz - 100kHz (-3dB)
Signal-to-noise:	-100dB
Size (w x h x d):	485 x 170 x 500mm
Weight:	32kg
Price:	£5,300 (pair)

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ALMOST A RELIGIOUS EXPERIENCE

Micromega *Trio*

The Musical Design Company, PO Box 13, London E18 1EG. Tel: (081) 989 0692

The Micromega *Trio* represents the state of the French CD player manufacturers' art. Its approach is unusual but in keeping with current hi-fi theory - instead of encasing the player in one box, as is done with the company's more affordable models, it has been split up into three component parts. These stack one on top of the other with the power supply at the bottom, digital to analogue converter in the middle and the disc transport on the top. Each component has two rubber feet and a spike which integrates with the other components via a column which extends through all the components. This ensures mechanical grounding of all three parts of the player, which is important because it creates an escape path for vibrations set up within the machine, and of course an entry for external vibration. The placement of the transport at the top of the stack should mean that the minimum of structurally-borne energy gets to the most sensitive part of the system.

All the casework is very nicely built and finished. It's made up in black anodised brushed aluminium and held together with Allen head bolts. Each part feels substantial and the complete stack is pretty hefty - it must weigh at least 15 kilos. The power supply is electrically connected to the player and DAC with computer style flat leads, these latter having conventional optical and electrical digital sockets. Both types of connector are supplied with the machine.

The *Trio* is almost the antithesis of a conventional CD player - it's not in the slightest bit convenient to use, and it sounds remarkably good. Playing a disc involves lifting the heavy perspex lid, removing the disc clamp (a metal puck attached to a circular piece of damped Sicomin), placing the disc over the shallow spindle and precisely relocating the puck. Okay, I've laboured the point a little, but not much, and it doesn't stop there: the remote control has a grand total of seven buttons with legends in French - no keypads or favourite track selectors here! The machine itself does have a few useful and rare functions including absolute and



mains phase switching on the converter and power supply - it would be marvellous if these could be switched remotely. All the onboard switches are those rather uncommunicative Sinclair ZX88 types and the display is a very basic calculator style affair which as far as I could make out shows only track number, but then again I never did want to know how much time had elapsed.

Serious sounds

Given the *Trio*'s dramatic appearance, and the complexity of using it, one deserves to have certain expectations of its sonic abilities. In my case, these were not only met, but comfortably exceeded. Given a good bit of software - a prerequisite with any source component and something of a must with the *Trio* - it can produce results that make the medium's shortcomings seem almost trivial. Initial reactions were that this was the first CD player I had used that had greater strengths than weaknesses. This feeling of discovery inevitably wore off as I played other less wonderful discs, but the sense of life, depth and weight that it extracted was quite superb nonetheless.

What it manages to do is extract musical information in an almost analogue fashion and present it with digital solidity, so you end up with extraordinary image depth

and precision, powerful tactile bass lines and remarkable musical involvement. Not being a disc buyer, preferring to spend my hard earned ackers on vinyl, my motley collection of review samples contains only a few discs of adequate sonic quality that I really like - the others are either boring or nasty in the digital sense: ie, wearing. But one, the John McLaughlin *Trio Live at the Festival Hall*, isn't at all bad in both respects, a point that was really brought home on the *Trio*. The fine percussion work rising up behind the speakers and JM's guitar playing centre stage making for very convincing listening.

The *Trio* has an almost analogue-like naturalness that makes it one of the most (if not the most) musically enjoyable CD players I've had the pleasure of using. But then again at £3,995, it's also by far the most expensive, although comparisons with other similarly priced machines, especially in terms of build quality, do it no harm.

At the end of the day the *Trio* is a very capable CD player. It has its competitors, of course, and any one looking for a top notch machine needs to bear this in mind, but they'll be hard pressed to do a lot better than this particular Gallic delight.

Jason Kennedy

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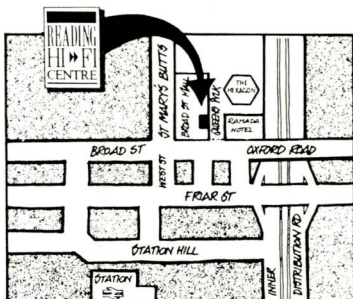
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Mission 767

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£2,300 is a lot of money for a pair of loudspeakers, and only represents the 767's starting price. But the struggle to get these monsters into the house and unpacked left me deeply impressed by the sheer quantity of engineering involved. The bathroom scales confirm the quoted figure of 75kg per cabinet.

The 767 system comes complete with electronics, specifically a special LFAU (low frequency alignment unit) amplifier based on Cyrus for driving the bass end of the system. Mission describes the approach as 'part active' (though 'part passive' would be no less precise). As with any conventional passive loudspeaker, the source signal is taken from an existing amplifier's loudspeaker terminals, but instead of linking directly to the loudspeakers, the cables are fed to a set of terminals on the LFAU.

The LFAU's rear horizontal connection ledge has three more sets of 4mm socket speaker terminals. Two of these sets are busbar linked to the input and merely serve to carry the original full bandwidth power signal in bi-wire mode on to the mid and treble terminals of the cabinets. The third set of output terminals represents the output of the LFAU and is the 'active' part of the operation. It takes the power signal as an input and then delivers carefully pre-equalised low frequency power to the bass driver terminals on the speakers.

This is an elegant and cost-effective approach to providing at least some of the benefits of active operation. Separating out low frequency drive in this way means the LFAU takes over the burden of driving power hungry bass drivers, leaving the existing system amplifier to drive a loudspeaker no more complex than a Cyrus 782.

Furthermore, the ability to adjust the bass level independently of the mid and treble avoids the need to compromise system sensitivity in the search for bass

extension, while subtle LF equalisation tailoring allows the balance to be optimised to match room, system and placement considerations. There may also be some advantage in directly coupling the amplifier and bass drivers in this way, though there is clearly some disadvantage in that the bass signal has passed through two separate power amplifiers in series.

The basic £2,300 package may consist of the pair of loudspeakers and an LFAU, though the package that was brought down for my delectation was well above the base model. Its stunning black piano lacquer finish carries a £700 price premium. Another optional and supplied extra was a (£230) PSX power supply unit, to give the LFAU a helping hand.

The loudspeakers themselves are unusually large, and distinctly assertive with it, especially used as supplied (and probably intended) without any form of grille. According to the manual, grilles are normally included, for those who prefer to keep both drivers and an abundance of company logo's hidden from view. Tallness may be the dominant gene, but these monoliths are also fairly deep, which will keep the baffle well clear of reflection even if the speaker is wall mounted (which is entirely feasible, due to the adjustable bass).

The shape and weight distribution are not ideal for stability (in a mechanical sense; there's absolutely no chance of accidentally knocking one over), and a good strong floor is probably a prerequisite. The plinth helps increase the footprint, and the decent front-to-back depth ensures that any residual rocking occurs in the plane of the baffle, and is therefore innocuous.

A glossy and smart exterior is only part of the story, and Mission's in-house cabinet works has gone to great lengths to ensure that the engineering integrity extends well beneath the skin. The whole thing is fabricated from massively strong

25mm MDF panels, each individually damped with bitumen pads. The midrange and treble drivers have their own 'cabinet within the cabinet' an enclosure dimensionally not dissimilar to the Cyrus 782, which the driver array also resembles. This provides considerable bracing for the main carcass sides.

Unlike the much less costly Cyrus and Mission models, the 767 is a fully sealed box or, more precisely, two sealed boxes, one within the other. Each uses twin top quality, plastic cone drivers operating in parallel into each fibre-filled enclosure, the top and bottom bass chambers being joined behind the inner enclosure. The bass drivers have 170mm cones and narrow surrounds, the bass/mid is a 120mm unit with heavier termination. The tweeter looks similar to that used in other Mission models - a 25mm soft-dome with short horn flare.

All drivers have cast chassis, and were really tightly screwed home into T-nuts, providing further evidence of the engineering integrity. Given Mission's enthusiasm for solid-core cables (about which I am yet to be persuaded), I was mildly amused to find heavy multi-strand used internally, hardwired on to the driver terminals. For fear of damaging the glorious finish, I didn't attempt too much dismantling, and didn't come across the crossover network in my limited exploration. On the evidence elsewhere, I wouldn't be surprised if it didn't match the massiveness of the impressive gold-plated tri-wire/amp terminals, neatly mounted in a recessed block.

In the interests of good stereo imaging, the driving array is symmetrical in both horizontal and vertical planes. The paired bass and mid drivers go some way towards simulating a point source centred on the tweeter, whilst at the same time adding an element of 'line source' behaviour. The substantial overall height, the driver placement, plus the narrow baffle and post-formed edging should all help create good consistency over a wide listening area.

Test Report

The most striking aspect of the 767's measured performance is its very impressive bass extension, achieving a 'flat' output right down to 20Hz in-room - a feat very rarely achieved, but probably important in creating a 'full size' sense of



scale. The peaks at 30Hz and 55Hz are largely room anomalies, while the 100-150Hz suckout is probably phase cancellation between the bass and the bass/ mid drivers, and is probably not too serious subjectively.

From 180Hz and on up the balance is near exemplary, with a slight step down at 700Hz and a slight 5-7kHz 'corner' the only mild aberrations. Consistency is highly impressive. So too is a sensitivity rating of 91dB/W, entirely uncompromised by a very straightforward impedance characteristic, enabling intimidating loudness levels to be achieved with a powerful amplifier, provided you limit the LFAU's gain and extension.

The LFAU level control covers about 5dB range at 20Hz, reducing to about 2dB at 100Hz; the action of the contour control is very subtle indeed. Off-axis traces confirm the fine acoustic integration of

The awesome Mission 767: an imposing presence and impressive sound.

the loudspeaker, especially laterally, some phase lobing being measured along the vertical axis.

Sound Quality

On the panel test day, the 767 received a mixed welcome, for reasons which became apparent later. The generous bass scale, weight and 'wallop' was well appreciated, but a general lack of subtlety and refinement was criticised, especially regarding the rather over-obvious quality of the tweeter.

Subsequent experimentation indicated that much of this was due to the electronics. Some weeks of listening to the supplied system made it clear that a single Cyrus 2/PSX driving amplifier is not really enough. The 767 may be a bit of a bruiser, but it is also fundamentally quite neutral, very

transparent and most sensitive to the quality of the driving source, which is a hallmark of a fine loudspeaker.

Passive Naim and Krell drive had already brought big improvements when Mission returned with an extra Cyrus 2/PSX to bi-amp the beasts. The improvement over the single Cyrus 2/PSX was dramatic, turning the 767-based system from 'impressive but I couldn't live with it' into 'this is mildly awesome', by removing much of the brashness and substantially enhancing the solidity and precision of the stereo soundstage. Time ran out before Naim bi-amping could be attempted, which in hindsight was probably a pity, but many of my earlier reservations had already been dispelled, so no matter.

The 767 is easy to drive and goes impressively loud, to the point where the LFAU starts to clip, by which time those in adjacent buildings will be banging on the walls. The package is perhaps better suited to CD and broadcast sources than 'high end' vinyl disc, and ultimately the attainable standards will be limited by the 'fixed' combination of LFAU electronics and LF enclosure, which is very good but falls a little short of the best in poise and timing.

Conclusions

The 767 is a very impressive package in very many ways, and certainly offers sufficient engineering content to justify Recommendation at its £2,300 price tag (assuming you can resist the fabulous piano finish), for those with a big enough room to accommodate the imposing enclosures. It succeeds admirably in the difficult task of combining subtle acoustic performance with wham bang bass extension, and low coloration with very satisfying dynamics and headroom.

Paul Messenger

First Published in *Hi-Fi Choice* April 1990

GENERAL DATA

Size (h x w x d)	138 x 29 x 43cm
Weight	75kg
Recommended amplifier power	15-150 watts
Recommended placement	flexible
In room averaged response limits 50Hz 10KHz +/- 7dB	below 20Hz
Large room/space LF rolloff (-6dB ref midband)	below 20Hz
Large room/wall LF rolloff (-6dB ref midband)	below 20Hz
Large room output at 20Hz (ref midband)	below 20Hz
Estimated midrange sensitivity (ref 2.83V, 1m)	91dB
Impedance characteristics (ease of drive)	very good
Forward response uniformity	very good
Price	from £2,300

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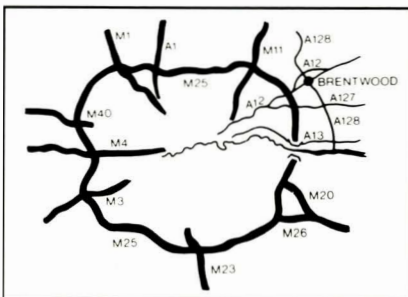
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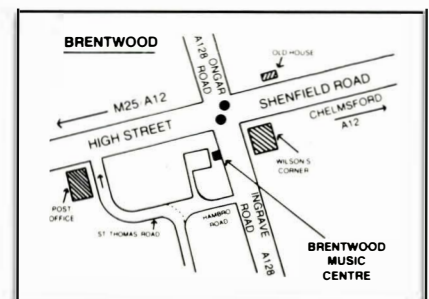
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Preamplifier

Naim NAC52

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The Naim NAC52 preamplifier has taken a long time to mature into its final production guise. It's only when one examines the product - and listens to it - that one realises why. To call it a complex and significant development is to be guilty of grossly understating what Naim has achieved. The design brief for the project was to build a preamplifier with a totally uncompromised sound quality, yet to incorporate into it a degree of flexibility and user friendliness rarely seen in the esoteric arena. It gives the kind of sound one associates with hairshirt, minimalist preamps - although I haven't heard one that even approaches its quality - yet configuring and using the amplifier is child's play. It even has full remote control. . .

The NAC52 is a two-box design. The half with the buttons on is the preamp proper, and the half that makes one's temples bulge when lifting it is its associated NAC52PS power supply. Thus the abbreviation '52 indicates the combination of these two items; neither can be used without the other. The '52 is the first Naim preamp that cannot be powered by the on-board supplies built into the company's smaller power amplifiers, the NAP90 and NAP140. Neither can the '52's power supply be used to upgrade any of the existing preamps, like the NAC62 or '72, as it contains the equivalent of six of the HiCap supplies used with those cheaper models within its casing. . . and more.

The reason for this apparent surfeit of power, handed out by a 530VA toroidal transformer through twelve, selected regulators, becomes clear with a little mathematics. The '52 has six audio inputs, each of which has two channels. Yes, each side of each input has its own individual regulated power supply! Further investigation reveals another transformer, this time smaller, lurking in the shadow

of the massive analogue device. This is to keep the digital side of the preamp fully isolated from the audio circuits. The '52 is logic controlled but in a special way. The digital circuitry within the preamp is only activated for the duration of control signals; when these are not present nothing of a digital nature occurs within the preamp, thereby avoiding any possible interference with the analogue circuits. In fact, there is no audible evidence of interference with this amplifier that I can detect - unlike other remote controlled amps and devices I have played with.

All the signals between the two boxes are handled by two cables; a regular 5-pin Naim SNAIC interconnect cable carries the digital power, whilst a sixteen-way lead connects the analogue stages to their juice. This takes the audio output away from the preamp to a pair of sockets on the power supply whence it travels to the next component in the chain, be that a power amplifier or electronic crossover.

The preamp is, as I've intimated, fully dual mono in construction. The bulk of its circuitry is housed on two large printed circuit 'mother' boards. Attached to these are smaller, plug-in boards designed to configure the input stages.

The fascia remains tidy and uncluttered despite the range of facilities. Volume and balance controls are rotaries, capable of operation either manually or via the remote handset, thanks to being motor driven through a clutch arrangement. To the right are two banks of push switches which control listen and record input selection, muting and mono/stereo switching. The input switch banks can be customised to provide the layout that the user desires by the simple act of changing their labels. The remote control handset similarly can be personalised. So if you wish, for example, to connect a CD player to input six, simply make sure that suitable daughter boards are in place inside the



amp, fit 'CD' labels on the illuminated preamp fascia buttons and remote control keypad, and away you go.

Sound Quality

The NAC52 combination is, I believe, Naim's most exciting product yet. I have it running now in my regular system and to say that it has brought a transformation would not make me guilty of hyperbole. Yet the system gave me immense satisfaction before. It wasn't perfect, no hi-fi is, but it was hard to fault in terms of the mechanical expressions of sound reproduction we use, and it was exemplary in the manner in which it communicated the emotional aspects of music to the listener.

I say this not out of immodesty, but simply to let you know where I was starting out. Bringing the very best out of this particular system is something I have worked on for a long time. All hi-fi equipment responds to care and attention in the way it is set-up and used. Active systems, however, can make one lazy. Because they have an inherent advantage over conventional passive systems in not having their performance strangled by loudspeaker crossovers, often they can



Naim's NAC52 makes many subtle sonic improvements.

Looked at with an engineer's cynicism, one has to admit that this increased emotional communication can *only* be due to mechanical and electrical phenomena. The '52 is just allowing more of the musical signal through, intact and unmolested; end of story. But to describe the impact of these phenomena in such cold sterile terms denigrates the effect that this amplifier has upon the listener.

At a more fundamental level, and one probably responsible for much of my increased enjoyment of recorded music, the NAC52 has incredible temporal acuity. It displays timing information with alarming forthrightness. For example, I've always admired the band Little Feat for its use of subtle slips and pushes in the players' timing to add colour and variety to their music. The '52 highlights such interplay between musicians, the way one player feeds off another, in a way I've not experienced before. Perhaps this is due to its 'speed', its retrieval of low level detail, or its lack of 'harsh' surrounding notes. This latter aspect has much to do with it, I would contend.

Often, I have found, when listening to a familiar recording, there seems a dichotomy in the way the '52 presents music. Whilst more appears to be happening, the sound appears to be leaner, as though there were less going on. What's missing, in hi-fi parlance, is any vestige of overhang or slurring. The sound is cleaned up, leaving only what should be present, and not adding its own contributions to the music.

The improvements I have attempted to describe do not come cheaply: the NAC52 costs £4,249. Nonetheless, I believe it offers real value for money, perhaps not for those who view hi-fi in terms of what components one gets, what kudos surrounds owning the products, or the status they bestow upon them, but for those who see music as a vital necessity to enrich their lives. Or, to steal a line from the Our Price advertisements, people who are "mad about music".

Malcolm Steward

First Published in Hi-Fi Choice issue No. 83

still sound good when less than perfectly - even sloppily - set-up. They're rather like American muscle cars which, even when they desperately need a tune-up, by dint of their enormous cubic capacity still pull like trains. When they're properly attended to, however, they do it with yet more ease.

Before the '52 took up residence, the system comprised a Linn *Sondek LP12* with Naim ARO tonearm and Linn *Troika* cartridge, NAIM'S (then) top-of-the-range NAC72 preamp with *HiCap* power supplies for it, and the NAXO 2-4 electronic crossover into a brace of NAP250 power amps driving active Naim SBL loudspeakers. The turntable sits atop an Audiotech turntable table with the electronics on Sound Factory *Tripod* stands. One dedicated mains spur runs the Linn and a second the electronics. The amplification is also earthed to a copper earth-spike sunk below ground in the garden. Supplementary source components include Naim's NAT-02 tuner and a Philips CDD 882 compact disc transport through an Arcam *Black Box 2*. The system is *never* powered down. One would expect it to sound good - and it did! But the NAC52's cup certainly runneth

over with improvements.

And the improvements weren't all in the areas where one would necessarily expect them. The '52 brings with it across-the-board changes that are most pleasing within themselves. For example, the frequency extremes have been, subjectively at least, extended. The response to transient information is nothing less than staggering, giving an impression of greater overall dynamics as well as further gradations to minor dynamic shading. And there's now a sense of general ease and extended headroom which makes even the most provocative recordings sound firmly under control.

This however, is all icing on the cake. The most noticeable change in the system has been in the way it communicates with the listener. For example, listening to a vocalist via the '52 is a far more intimate experience than it was before. One is able to focus more accurately not only on the voice itself and the lyrics being sung, but on the character of the voice and the singer. The lyrics can even take on new meanings and relevance. Subtle clues in the voice betray the singer's intent: one can recognise tiny hints of irony, anger, happiness that passed unnoticed before.

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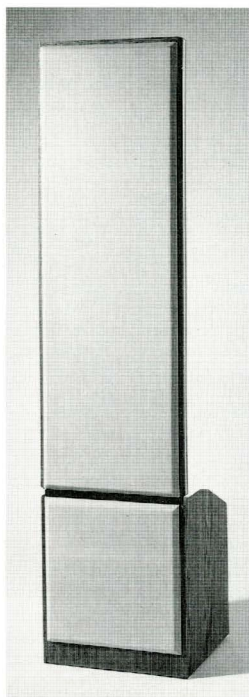
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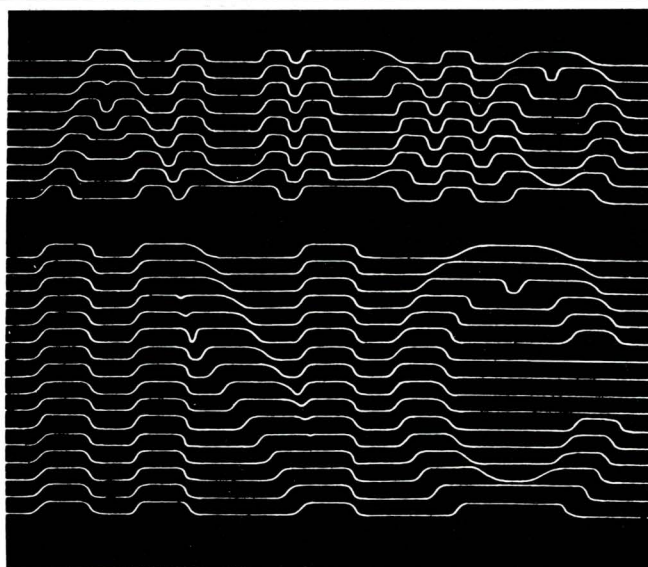
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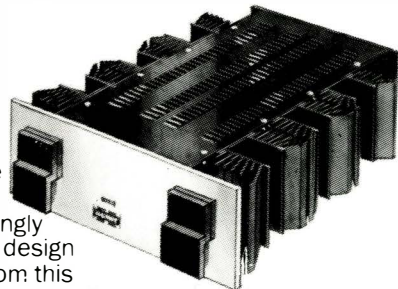
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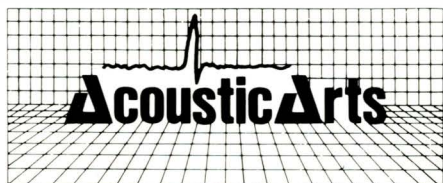
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Rega Planar 3 Turntable	£207.00
Rega Elys Cartridge	£74.00
Naim Nait Amplifier	£389.85
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Linn Sondek LP12 Turntable	£598.00
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Linn K9 Cartridge	£81.00
Arcam Delta 90 Amplifier	£399.90
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Rega Planar 2 Turntable	£155.00
Audio Technica At110E Cartridge	£21.00
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Turntable

Digital sources may be attracting the lion's share of interest these days but this does not mean hi-fi's 'analogue establishment' has been standing idle. Far from it, if Oracle is any guide. Not only has this famous Canadian manufacturer expanded its range in recent times but it has also up-dated its principal model - the *Delphi*.

Fuelled by fond memories of previous *Delphi* turntables, my expectations for the new *MKIV* were high. Fortunately, I was not to be disappointed, for the *MKIV* is no mere aesthetic re-think but perhaps the most radical adaptation yet of the basic design. Gone is the goeey mat to be replaced by a hard methyl methacrylate surface bonded to the top of Oracle's original aluminium/composite platter. Not only does this surface provide a more favourable impedance match with record vinyl, but its mild contouring helps iron out warps as the disc is pressed home by a screw-down clamp.

A similar seven-layer alloy/epoxy resin sub-chassis is used, though this now incorporates a revised inverted bearing assembly together with a peripheral counterweight to compensate for changes in the new one-piece platter/mat. Yet for all these amendments the *Delphi* retains its original and unique sense of style.

In fact, the aluminium surfaces of our *Delphi MK-IV*, including the platter and sub-chassis, were finished in a black epoxy while the brass clamp, suspension towers and bearing housing were picked out in 24K gold. The contrast between this polished gold and the gloss black lends the deck an exquisite appearance, as much an artistic centrepiece as functional engineering.

However, the premium for this luxury version is a steep £1,000. You could also save yourself a further £500 by opting for a single-speed *Delphi IV*, bringing the overall cost down to a manageable £1,450. Did I say manageable?

Sound Quality

Oracle's *Delphi III* was the only turntable that ever came close to toppling the *PT TOO* from its precarious perch at the head of my own system. Yet this was in combination with Air Tangent's superb linear-tracking tonearm, a duet that is mildly more successful than the partnership between Oracle and SME.

If memory serves me correctly, and bearing in mind that the remainder of my system has not altered, this *Delphi IV/SME*



Oracle *Delphi IV*

Gamepath Ltd., 25 Heathfield, Stacey Bushes, Milton Keynes
MK12 6HR. Tel: (0908) 317707

V combination was just that bit warmer and richer in colour than was the *III*. This was not manifest to the extent of any artificial blooming, it simply accentuated the natural 'roundness' of the music's tone and texture.

Take Peter Gabriel's *Don't Give Up* as an example, for here the contrasting qualities of the vocals was artfully depicted, Kate Bush's lush and articulate, Gabriel's that much rawer and immediate in projection. To experience this was captivating enough, but add its subtle, fluid depiction of the underlying bass rhythm and the entire performance simply crystallised.

Whether you choose to interpret the subtler dynamic shading of the *IV* as a genuine improvement is very much a matter of personal taste. Suffice it to say that if you have been lulled by a *Delphi* before, then the *IV* will not shatter those fond memories. It has character, certainly, but it's a character that suits the sparkling demeanour of MCs like VdH's high output *MC Two*, a favourite cartridge that was eagerly pressed into service for this test.

Perhaps I have been living with the razor-sharp focus and tactility of a digital system for too long, but I could not help but notice some slight softening of the deepest, earthiest bass notes, and a subtle

but quite detectable muting of the very highest treble.

Yet spin a well-recorded disc like Thomas Ornberg's *Blue Five* (Opus 3) and the *Delphi IV* will demonstrate just how bright and positive a state-of-the-art deck can sound. There was no hesitation in the raw but natural edginess of the trombone just as the slap of bass was given free rein, striking deep into the natural ambience of the recording. So, despite certain technical concessions, the *Delphi IV* stays true to the emotivity of the music.

Conclusions

I spent many hours working my way through favourite records without finding cause to re-adjust, tweak or otherwise fiddle with this deck. Once correctly set-up, it stays that way. It's a fabulous but eminently sensible piece of engineering, painstakingly constructed, but now evolved into a reliable and highly refined piece of equipment.

Paul Miller

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Type:	Manual
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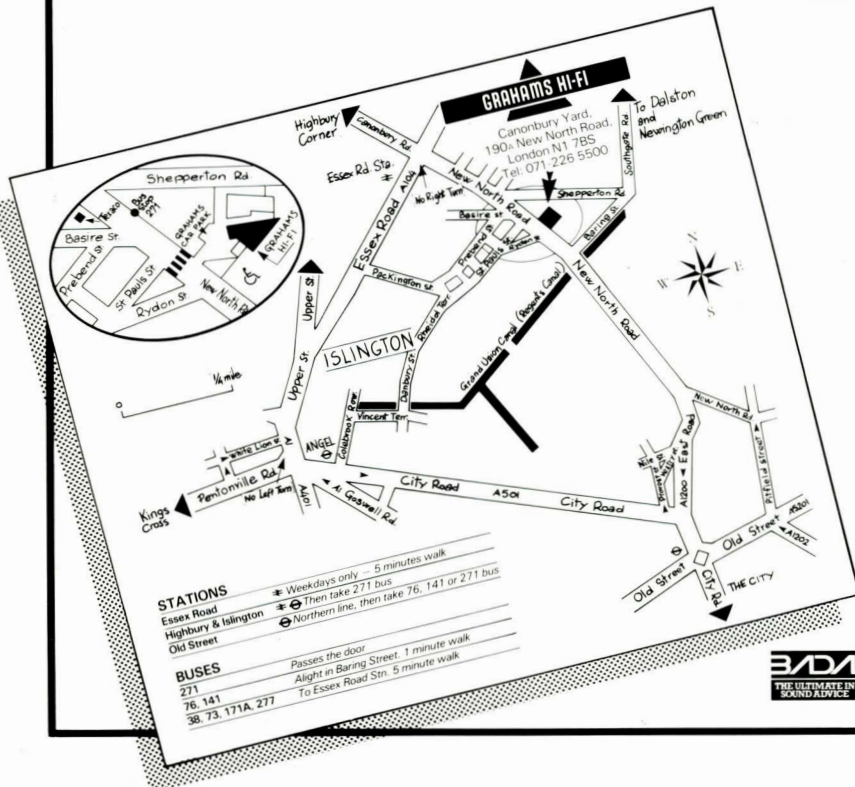
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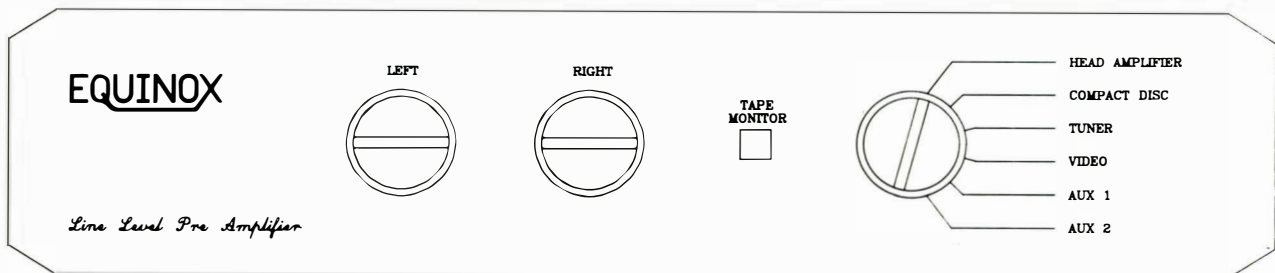
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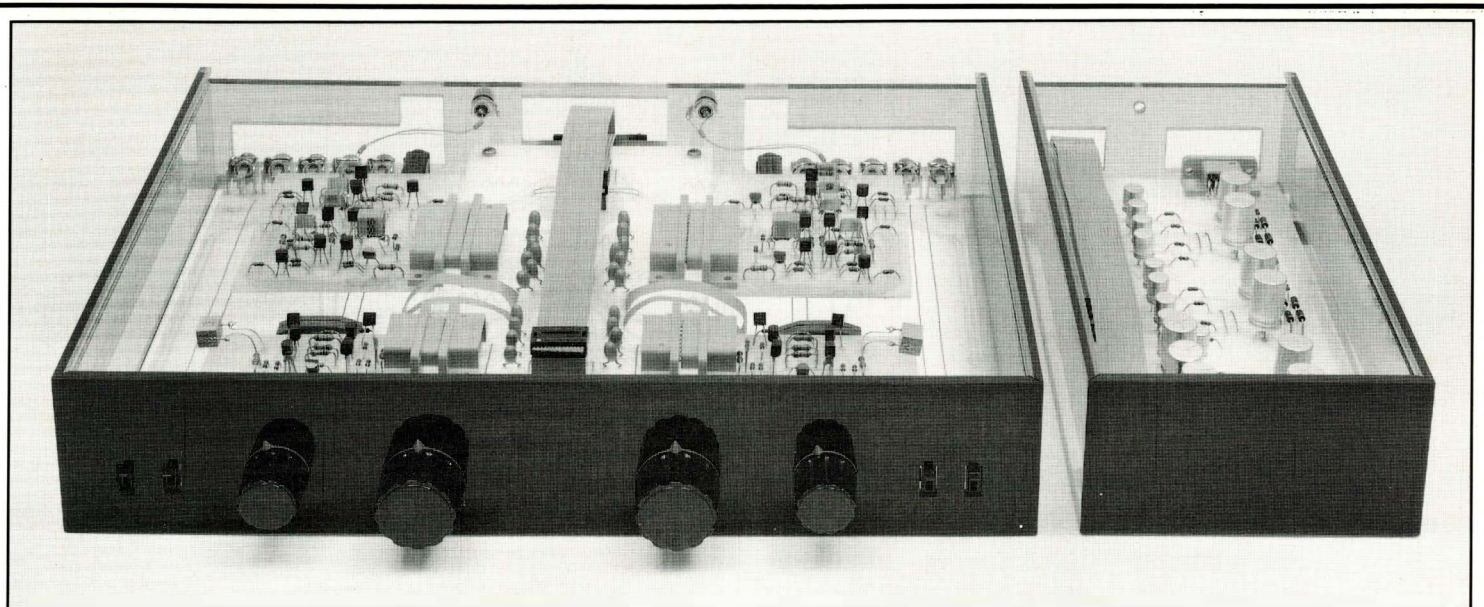
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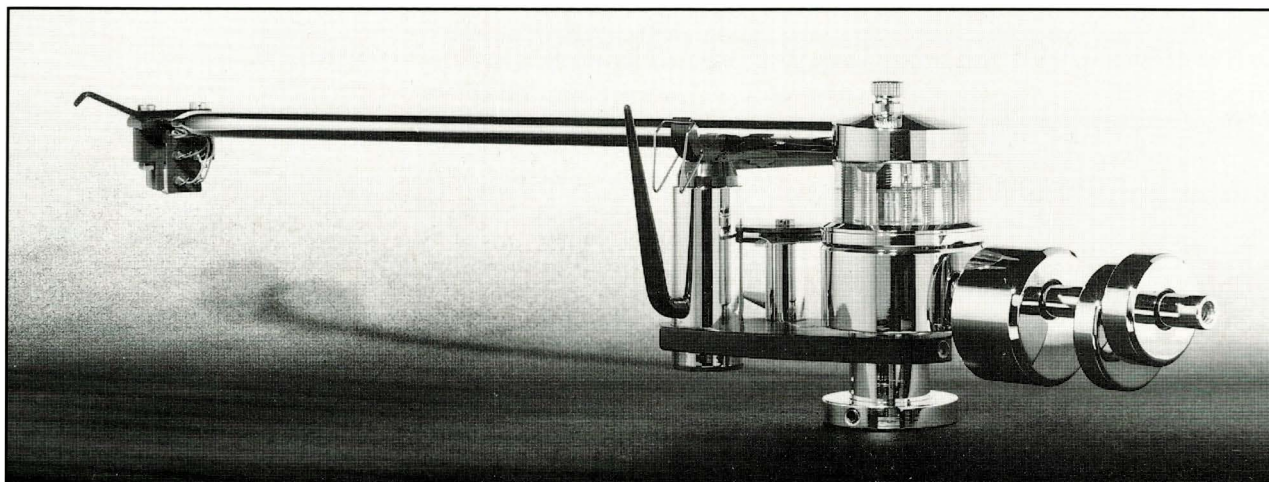
This is made possible by simple circuit configurations carefully optimised for their tasks and taking account of important factors which are dismissed as totally unimportant by other manufacturers.

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Amplifier

Primare Series 928

Quantum Audio Ltd., PO Box 26, Kilmarnock,
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The number 928 conjures up images of a luxury grand tourer effortlessly cruising the German autobahns. You need a healthy bank balance to stand the cost of Porsche's flagship automobile, for sure. And while not quite as costly, Primare Systems' Series 928 amplifier system is equally esoteric and - let's be honest - available only to the privileged few who can afford to spend over £9,750 on a hi-fi amplifier.

That's right: £9,750. But if the price tag makes you reel, let's be clear from the start that the Series 928 pre/power combination is the stuff of which dreams are made. And as you will see when perusing the other pages in this *Collection* issue, in the realms of high-end hi-fi it is far from being the most expensive amplifier system in which you might invest.

While most audiophiles have to suffer for their pleasures, 'making do' with hi-fi components which deliver the goods sonically but often are inconvenient to use and an eyesore in the home, the Danish Primare 928 system is designed to cater for the most discerning hi-fi enthusiast while offering the luxury of remote control operation and looking like a million dollars. It scores on all three targets.

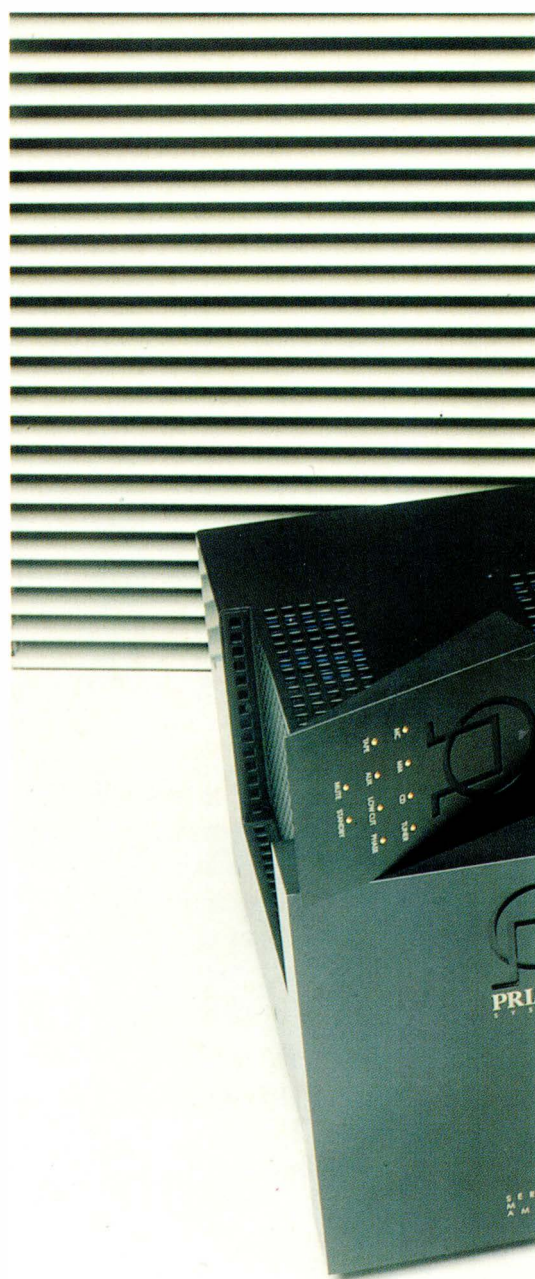
Regular *Choice* readers might remember an *Aspirations* feature dating back to September 1988 in which we described a system employing the Series 928 preamplifier driving ATC SCM50

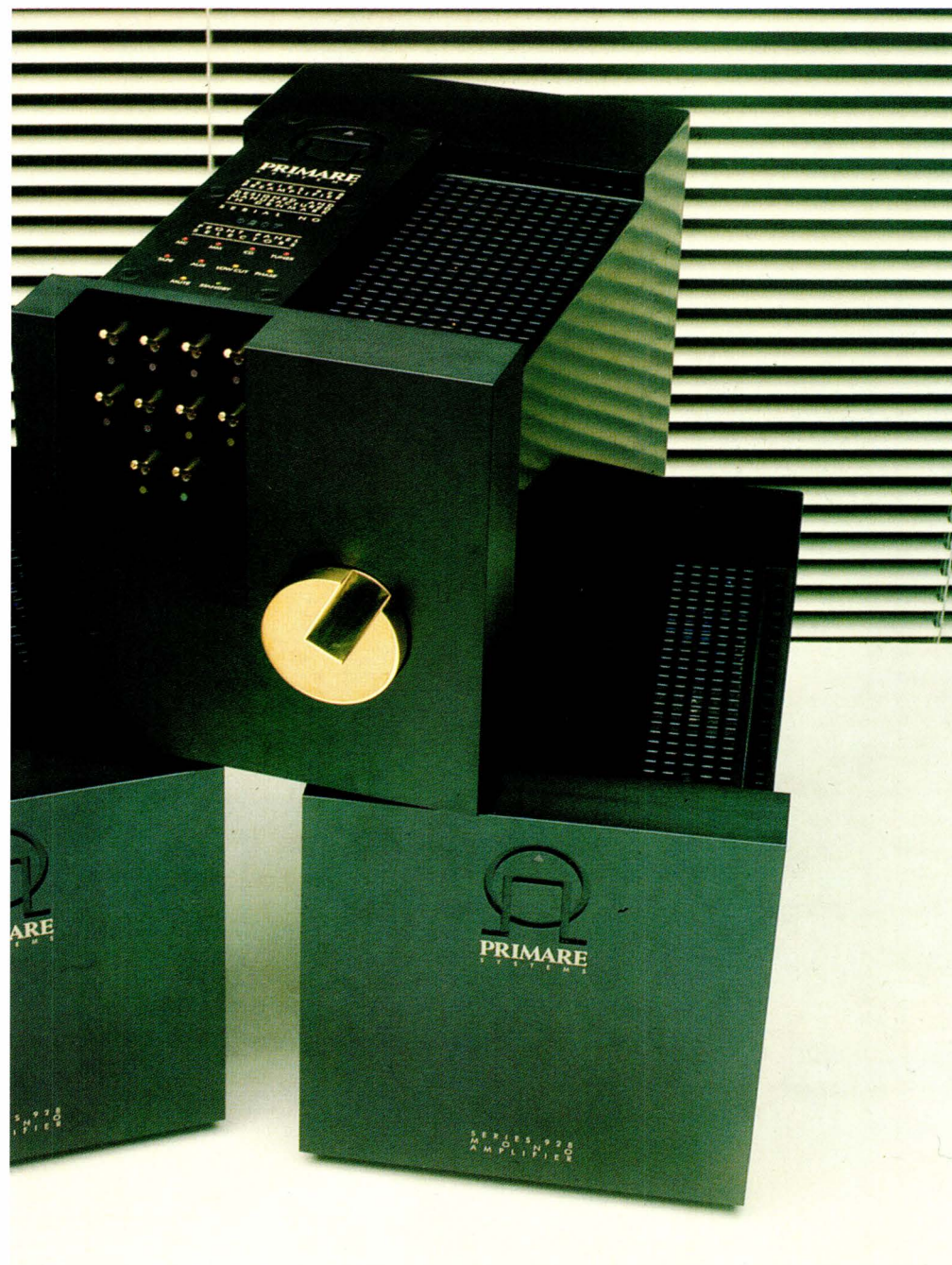
active loudspeakers. Primare's £4,750 preamp (£3,750 if you forego the infra-red remote control facility) is perfectly suited to such applications, and features comprehensive user-adjustable set-up facilities. Removing a small plate at the rear of the preamp reveals a bank of DIP switches providing ten different sensitivity settings (0.05 to 2.0mV) and 12 impedance adjustments (7.5 to 2kohm) to suit just about any moving coil cartridge. A further set of switches adjusts MM input sensitivity (2 to 10mV), while - just in case you need it - a small toggle switch allows the CD signal to be attenuated by 6dB to allow better matching with other line inputs. The 928's other unashamedly luxurious touches include phase invert, mute, and a low cut filter, plus a 'standby' facility which shuts the preamp down while maintaining optimum operating conditions and working temperature.

All controls - including the MM/MC, CD, tuner, tape and Aux selectors, plus the motor-driven stepped attenuator volume control - are operable via capacitive type finger-touch sensors on the tastiest remote control handset you've ever cradled in your palm. A small infrared receptor (25 x 25 x 50mm) connects via a 3m lead and Lemo plug to the rear of the 928, which means that the preamp does not have to be in line of sight from your listening seat. The receptor can be placed anywhere in the room, cable length allowing.

There are touches to the design of the Series 928 which remove it from the world of everyday audio components and put it in a class of its own. For example, the wedged shape of the hand-set perfectly matches the size and shape of the cut-out on the preamp's fascia. And the position of the handset's touch controls emulate exactly the toggle switches on the preamp itself. Nice. And while there's no balance control (in the best minimalist tradition; there are no tone controls either, of course) there is a set of on-board DIP switches to adjust the gain separately for each channel in 0.5dB steps, allowing you to compensate for any mild channel imbalance in your phono cartridge. The preamp even has a rear mounted headphone socket.

Primare's designers seem to have thought of everything. However, be warned that in the interests of fidelity there is no tape monitor loop in the signal





Series 928 from Primare: audiophiles need not suffer for their pleasures.

as short as possible by using servo regulators rather than series capacitors. It's all good stuff, with much attention paid to power supplies and grounding for optimum sound quality. And like Naim Audio's recently launched NAC52 remote control preamp (see page 102), Primare's designers were careful to ensure that no digital nasties from the remote control system could spoil the audio performance of the amplifier.

Sound Quality

The bottom line, after all this, is that the 928 pre/power is something quite special, combining superb user friendliness with the sort of sound quality one usually finds only in stripped-down 'hairshirt' products. Which is why it costs £9,750 (the mono power amps are £2,500 each). Wearing my heart on my sleeve, I have to admit to a predilection for glowing bottles, and in my opinion this combo doesn't have quite the transparency of the best tube amplifiers, but the 928 combo sounds 'rich' and smooth with excellent sound staging and tremendous 'weight'. Perhaps just a little too polite-sounding for some tastes (though much will depend on partnering speakers), these amps must be the least fatiguing solid-state components I've ever heard, with silky highs, a natural midrange and deep, powerful bass. It's reported to be a natural performer with some electrostatic loudspeakers - and I can believe it.

Conclusions

Audiophiles usually expect their amplifiers to be minimalist through and through. The Series 928 system (at £9,750) breaks the rules in combining high-end performance with sumptuous styling and superb user-friendliness, and in doing so makes it one of the most desirable hi-fi amplifiers in the world.

John Bamford

path. This means owners of 3-head cassette decks can't monitor recordings off-tape - which isn't the end of the world as most decks are equipped with headphone sockets. But more significantly (especially since, due to its remote control capabilities, the Primare 928 strikes me as being ideally suited to being integrated in to a high-end audio/visual system - maybe with a projection TV system and Dolby Pro-Logic surround sound), tape loops are useful for hooking up surround sound decoders. Oh well . . .

I referred earlier to the Series 928 'system'. Although the preamp is a fascinating high-end proposition in its own right, most customers are likely to partner it with Primare's matching 928 monoblok power amplifiers. Each is rated at 100W into 8ohm, using discrete components throughout and employing no negative feedback in the power output

circuits. The manufacturer claims 40A peak current capability. Certainly Series 928 was conceived as a complete pre/power package, with signal transmission between the two taking place in balanced mode (both XLR and 'ordinary' phono sockets are provided) and with symmetrical circuit configurations throughout the amplifier stages.

Internally, attention to detail is worthy of the finest audiophile gear. The 24-step rotary volume control uses metal film resistors and gold plated contacts, and in order to prevent signal loss through oxidation, all switches and relays have gold plated contact surfaces. The source selector relays are also hermetically sealed as proof against ageing. Meanwhile there are no carbon components in the signal path. Metal film resistors and Teflon insulated cables and sockets are used throughout, while the signal path is kept

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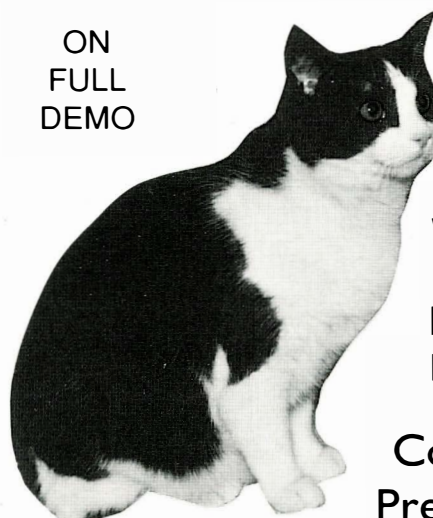
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Proceed *PDT/PDP*

Path Premier, Unit 2, Desborough Industrial Estate, Desborough Park Road,
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Madrigal's first product under the Proceed banner, the single chassis *PCD* CD player, has quickly established itself as a serious entry in the high-end arena. It has made its mark because of fine sound quality, fresh styling and a sensible price tag. Now the company has split the *PCD* into transport and D/A converter, with some added fine-tuning, to create a two-box player.

Proceed Digital Transport

The *PDT* employs the same fascia, chassis and transport as the *PCD* player. Certain parts are more highly specified in the *PDT* than in its donor sibling mainly to allow for this standalone transport to be used with other makes of D/A converter.

The revisions made to the Proceed transport to change it into a *PDT* include active circuits used in conjunction with a pulse grade matching transformer for a clean and stable output with precisely defined digital transitions. In addition to improvements regarding noise, this helps to produce a better interface with both the *PDP* Digital Processor and other brands of D/A converters.

All non-essential controls are relegated to a hand-held remote. At first, the fascia-mounted controls seem odd, as they lack a positive feel, Proceed having opted for 'soft' action which doesn't communicate much to the user. The buttons are lozenge-shaped and finished in the kind of rubber which is found on modern cameras as well as many remote controls.

The choice of functions on the fascia includes muted fast scan in both directions; this requires the user to keep an eye on the numerical display as audible cueing is unavailable. The only elapsed time figure available is that of the track in play rather than the entire disc. Also present is a standby control; both pieces require extensive warm-up periods. Madrigal suggests that the mains be left on at all times, via the primary switches at the rear of each unit, while using standby to put it into a 'semi-off' position. Provided this method is used, the time between

switching from standby to optimum playing conditions is negligible.

At the back, the *PDT* sports a mains cable, the aforementioned on/off switch, and a fuse-holder. Coaxial digital output is offered along with XLR-styled balanced digital output, but Madrigal has chosen not to offer optical output, in line with many American high end manufacturers. American designers place great value on balanced operation and the Proceed is one of the first players to exploit the balanced inputs now appearing on high end preamps.

The construction is superb, with heavy gauge steel used throughout and no rough edges showing anywhere. The Proceed design team paid attention to the thermal behaviour of the materials, and spent much time and money researching the effects of circuit board location. As a result, boards are positioned as much for sonic reasons as for manufacturing purposes, including minimal use of wire and ultra-short signal paths.

Proceed Digital Processor

Because of the construction and the design integrity, the isolation between the two pieces allows the user to place the transport on top of the *PDP* without any interference. Aesthetically, the match is perfect (though the combination does beg a uniform preamp). The *PDP*'s fascia contains a window with a read-out displaying sampling frequency, along with four LEDs to indicate which input is in use, another to show if pre-emphasis has been activated and an input selector button.

The rear features unbalanced phono inputs for Sources 1-3 and XLR connection for input No 4. Outputs include unbalanced phono or balanced XLR, a digital output facility being fitted for feeding a DAT recorder. As mentioned above, optical connection is not available, and Madrigal's designers refuse to consider it until something is done about the quality of the standard TOSlink connector.

The *PDP* uses two precision 18-bit DACs with x8 oversampling, revealing another American high end bias: bitstream is not yet deemed worthy of high end players. Madrigal is not alone in this belief, as a glance at the specification of the most highly regarded CD players will show. The *PDP* can be updated for new technology, so Madrigal owners will be able to go bitstream if and when the design team feels that it has something to offer over multi-bit.

Madrigal points out that the *PDP*'s circuit is the same as the *PCD*'s, but performance is improved as the power supply no longer has to accommodate a transport and its associated stages. Like the *PDT*, extra attention was paid to isolation from microphony, circuit board interaction, magnetic radiation and other problems which may occur when using separate components rather than an all-in-one player. Again, interfacing with other makes of transport should be as close to ideal as possible.

Source switching is via relays chosen for both reliability and lack of sonic coloration. The selected signal is routed to a computer-grade pulse transformer, then to a specially-designed receiving circuit which improves the incoming signal by filtering noise and resquaring the D/A summing signal.

Sound Quality

Any readers wondering about the worth of balanced operation between transport and D/A will appreciate the *PDT/PDP* as they can be run with both unbalanced and balanced cables simultaneously for easy comparisons. Switching from one to the other, the panel agreed that the gains of balanced over unbalanced were undeniable. By degree, the differences are as dramatic as those between cable types, optical versus coaxial or bitstream versus multi-bit. As with pre-to-power amplifier connections, the balanced operation with digital data protects the signal from noise caused by RFI, mains, etc. This was evident even with short



Split Proceeds:
Madrigal justifies extra outlay.

of performers' actually appeared slightly in front of the loudspeakers, but not so far as to place them in the listener's lap. The Marantz as a pair, or any other transport heard via the 203, placed the images in line with the speakers, for a less forward sound and one to be preferred by those who don't like listening in the near-field, unavoidable in small rooms.

What the D/A section of the Proceed package in tandem repeatedly offered

was superb bass control, but with less extension than the Meridian or the Marantz. The Proceed D/A converter, regardless of the transport used, also revealed more detail, with a very slight loss of sweetness when compared to the Meridian. Fortunately, the standards set by all of the products used for comparison are so high that this slightly recidivist behaviour does not mean a return to the hyper-etched sound associated with CD from the Bad Old Days. Even so, the 'analogueness' of the PDP doesn't quite approach the levels established by the far dearer California Audio Labs *Tempest II SE* player.

Conclusion

Whereas the PDP processor is good enough by any standards to qualify for purchase on its own, it's harder to assess the PDT as a separate item; the other result of the panel's experiences with so many combinations is that D/A converters are less fussy about the transports used than the transports are about the D/A converters into which they're fed - a curious two-way street. The PDP at £1,395 is much easier to recommend than the PDT at £1,690, though the pairing represents the best that you'll get from either section. So, in considering the two versus the single-box parent at £1,850, Madrigal has shown that the splitting of the sections into separate enclosures easily justifies the extra outlay.

The Hi-Fi Choice Panel

lengths of cable.

Madrigal's distributor supplied identical cables differing only in their terminations to ensure valid comparisons. Sonic gains noted with the balanced operation included better bass control, a further lowering of background textures to create even quieter 'silences', more realistic ambience, better retrieval of inner detail and greater top-to-bottom consistency.

The two Proceed products were auditioned both as a pair and with other devices, including the Marantz DA-12 and the Meridian 203, plus the Marantz CD-12 transport and the transport section of Arcam's *Delta 70.2*. The findings were alarming in light of the increasing popularity of separate transports and D/A converters, as the panel found a need for component matching which many had hoped would disappear when mating products in the digital domain. This has nothing to do specifically with the quality of any of the products and reflects only on how two makes of CD hardware can interact. Notes were necessary to keep clear the pecking order of the various matches.

The PDT transport worked better with the PDP and the Marantz DA-12 than it did with the Meridian; Madrigal's designers could, if they so wished, use this as an argument against bitstream. The Marantz transport preferred the PDP and its own D/A to the Meridian as well. The Arcam's transport section, however, sounded best with the Meridian, but the

listeners were loathe to dwell on the idea that a nationalistic bond may have been formed. In any case, the Arcam sounded far better with all three outboard D/A converters than it did with its own, putting to rest arguments from certain quarters that a single chassis player will beat a mixed-brand two-box pairing because the halves are dedicated to each other.

The implications for assessing or purchasing a D/A converter and/or standalone transport is therefore complicated by a need to establish some form of synergy, and both users and reviewers should be careful not to condemn a transport or converter on the basis of one 'pairing'. In addition to assessing the Proceed components, the auditioning of the above combinations revealed that each of the products chosen for the sessions was worthy in its own way, but that successful matchmaking is a lot more than finding two halves with compatible input/output socketry. As far as the Proceed units are concerned, the sessions revealed that the PDP/PDT worked best as a pair, or mixed with the respective halves of the Marantz CD-12 two-box player.

As a team, the Proceed units demonstrated why so many American manufacturers have adopted this package for demonstration purposes. Imaging and precise instrument/voice location avoided the 'Viewmaster'-style of 3-D as the images had individual depth as well as front-to-back spacing relative to one another. This nicely-recreated 'space full



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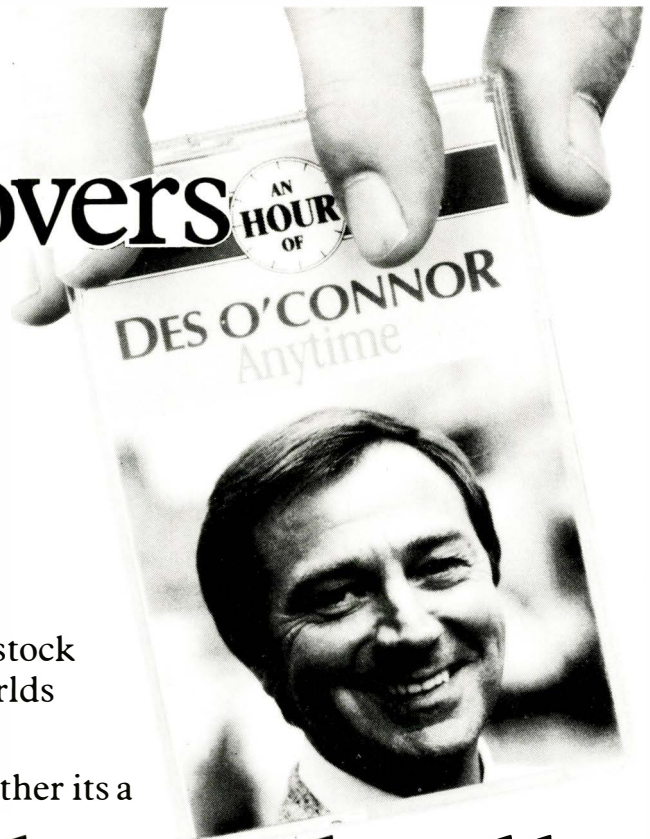
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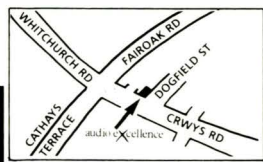


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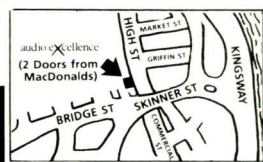
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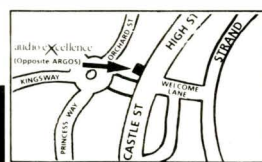
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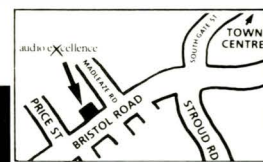
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Phono Amplifier

As compact disc strengthens its foothold in areas of the market once dominated by records, there is an increasing temptation to produce amplifiers or preamplifiers without dedicated phono stages, or with the phono stage housed separately, to be purchased as an extra cost option if it is deemed worthwhile. The logic here of course is that good phono design is expensive, and those not interested in black vinyl will increasingly resent paying through the nose for an input they will not use.

An alternative, and perhaps more insidious scenario is that designers of integrated amplifiers and preamplifiers will be tempted to skimp on phono circuit design, or simply won't be familiar enough with the qualitative demands and possibilities of vinyl to do the job properly. It is to

provide a solution to situations such as these that the subject of this review is dedicated. Supplied in the same pine box used for the *Artemiz* arm, the *Artaxerxes* module provides phono step-up and equalisation for moving coil cartridges. It operates completely transparently from the user's viewpoint - there is no separate on/off switch and no other controls of any kind. It accepts the raw, unequalised output of a low output moving coil cartridge, and it supplies an equalised signal which can be fed into any 47kohms line level (or tape) input on any amplifier.

Roksan claims that the design of the *Artaxerxes* makes it effectively immune to RFI - there was never the slightest suggestion of interference from any outside source in my system, though, in fairness, I don't normally suffer problems. Noise and distortion figures are state-of-

the-art: THD <0.002 per cent and noise >-83dB (both at 1kHz, 500mV out) are examples from an impressive spec sheet. After a second stage of power supply smoothing within the preamplifier itself, power supply noise is said to be less than 10uV from 1Hz - 3MHz.

Perhaps the key technical feature of the *Artemiz*, however, is the fact that it operates in as close physical proximity to the cartridge as can be contrived, eliminating long lengths of cable and extra connectors which inevitably degrade such low voltage signals. I gather some thought was even given to building the *Artaxerxes* into the arm tube of the *Artemiz* tonearm. Now that would have been something. . .

The *Artaxerxes* allows poor or second rate phono inputs on preamplifiers or integrated amplifiers to be by-passed, and adds a phono facility to amplifiers that lack one, or where an existing phono input only caters for high output cartridges, which in the main means moving magnet cartridges. But if you're expecting a straightforward product that can be used

intractable problem for non-Roksan users, though there is nothing to stop anyone buying an *XPSII* just to power the step-up, and a dedicated supply is promised for 'some time' in the future.

Three: the *Artaxerxes* is designed to fit the large, rectangular arm cable leadout hole on the back of a Roksan *Xerxes*, and cannot always be accommodated in other players. It is possible to use an arm base extension lead, but this would throw some of the advantages of the design away. Finally, point Four: the *Artaxerxes* receives an input signal through a captive DIN connector on the end of a very short lead,

which cannot be connected to arms with fixed leads, of which the Rega designs are the most widely available.

There is one remaining compatibility issue. The output frequency response is specified for a particular range of

load impedances, namely 47kohms or more. Reduced load impedance leads to a thinner, lighter bass and a brighter overall balance. This requirement may not seem particularly onerous. After all, 47kohm was no accident: it was chosen because it is the industry standard figure, adhered to by the overwhelming majority of amplifier designers.

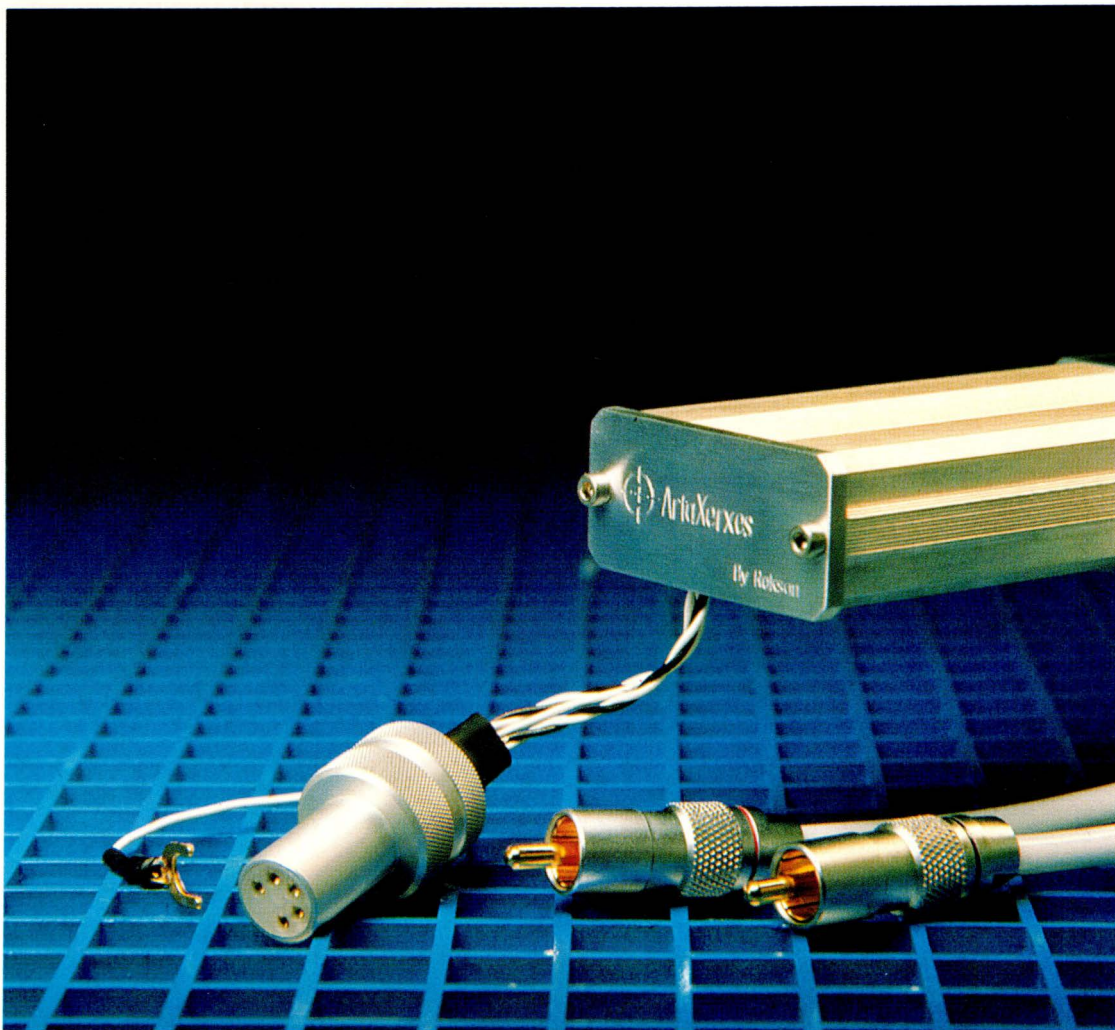
But there are important exceptions, including a number of amplifiers likely to prove particularly attractive to the kind of audiophile who will be excited by the idea of the *Artaxerxes*. Unfortunately, my own DNM preamplifier is one such offender, and so is the Threshold *FET/10*. To help with the testing, I eventually used a Bryston preamplifier (distributed by Roksan) as a line input. The tape output from the Bryston was fed into the main system amplifier - a Threshold *SA/4* power

Roksan *Artaxerxes*

Roksan Engineering Ltd., 21 Ddole Rd, Llandrindod Wells,
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in any system matching this description, you are in for a surprise. First and foremost the *Artaxerxes* is designed to complement Roksan's own top end *Xerxes*, *Artemiz* and *Shiraz* combination.

There are four ways in which the restrictions operate. One: gain and impedance settings are designed specifically for the Roksan *Shiraz*. In fact, the loading is a wholly unexceptionable 100ohms, but the *Shiraz* has higher output than many and cartridges with unusually low outputs - older Ortofon's for example - may have insufficient gain for certain systems. Two: the *Artaxerxes* derives its power from a special output on the back of the Roksan *XPSII* turntable power supply (the original Roksan supply identifiable by the lever speed change switch is not suitable, but can be upgraded). This is likely to prove a more



amp - for much of the listening period. Roksan say that the *Artaxerxes* is 'virtually impossible' to overload at any frequency, and nothing in its audible performance contradicts this assertion.

Installation, probably best tackled by the supplying dealer, includes attaching the *Artaxerxes* to a bracket screwed into the inside corner of the turntable, projecting through the hole in the back normally used for the arm cable. There are three cables, one to supply power, which connects to the back of the turntable power supply, and two signal cables which plug into a spare amplifier line (or tape) input.

The *Artaxerxes* and the arm cabling are normally earthed via the turntable power supply. At the end of the insulation process, what you have is a complete record player with a line level output which can be used in much the same way as with a CD player or tuner.

Sound Quality

The *Artaxerxes* takes a day or so to come on song, and improves perceptibly during the following week. It is probably best left switched permanently on, which shouldn't have too devastating an effect on the piggy bank due to its minimal idling power consumption.

With its first outing in the amplifier

Roksan Artaxerxes: painting a true picture, and making no concessions.

field, Roksan have struck gold. Used with the standard Roksan front end - *Xerxes*, *Artimez*, *Shiraz* - the *Artaxerxes* turns out to be an elegant and articulate performer, with perhaps the most exquisitely detailed phono step-up the author has yet encountered.

Some products sound detailed for artificial reasons, usually as a result of a bright tonal response which emphasises transient leading edges at the expense of the 'body' and tonal variety of the sound. The *Artaxerxes* is not substantially bright, though it's certainly not dull: the sense of clarity and detail are inherent. Bass quality too is unusually firm and solid. The Roksan bass, which can sound a little lean and antiseptic in some combinations, really springs to life through this step-up, and mid/treble quality is refined and smooth, though on test it picked up a trace of roughness and 'edge' from the Bryston preamp used for its 47kohm loading. Both the DNM and Threshold preamplifiers eliminated this minor shortcoming, but they incorrectly loaded the *Artaxerxes*, reducing bass output to an extent.

The active, lively quality of the *Artaxerxes* means that record surface noise

can sound a little fierce by the laid back standards of many phono preamplifiers. My view is that in this, as in its overall presentation which is a little more compact disc-like than many will expect, the *Artaxerxes* paints a truer picture than most. Its incisiveness and resolution and its ability to start and stop on the head of a pin make it also the most informative way of extracting music from vinyl.

Conclusions

The *Artaxerxes* is a brilliant piece of kit. Its only obvious shortcomings are that

you may not be able to afford one, and it may not work with your record player.

The net outcome in a sympathetic system is lively and engaging in a way that will surprise many vinyl aficionados. The surprisingly CD-like presentation, which for some will be a source of criticism, is actually one of its greatest plus points, especially as the real strengths of vinyl (resolution, soundstaging etc) are reinforced rather than diminished by the *Artaxerxes*. But those who think that records should sound warm, romantic and/or 'nice' (as many apparently do) should apply elsewhere. The *Artaxerxes* makes no concessions whatever to any of the nostalgic notions of record reproduction that are prevalent in 'flat earth' quarters.

Alvin Gold

GENERAL DATA

Input sensitivity:	0.5mV
Maximum input:	70mV at 1kohm/100ohms
Input impedance:	100ohms
Gain:	60dB
RIAA equalisation:	+/-0.2dB 20Hz - 20kHz
Signal/noise:	>83dB (ref 1kHz @ 500mV out)
Total harmonic distortion:	<0.002 percent
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Sony KV-FX29 TV

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The term hi-fi has come to mean the reproduction of music in the home, but the original concept of high fidelity could equally be applied to other media, such as photography or cinematography, for example. To date, commercial televisions have been much of a muchness as far as picture performance is concerned, but recent advances in technology are just beginning to bring a hi-fi dimension to the televisual experience.

The KV-FX29 is no ordinary CTV. The screen is large, though not extravagantly so, but the price-tag is more than twice a similar 'standard' (high spec) CTV. The difference is due to a very new technology known as a 'flicker free' display, which involves great gobs (6Mbits) of expensive on-board high speed solid state RAM (random access memory), the related A-to-D (analogue to digital) signal processing, plus the special circuitry to drive the CPT (colour picture tube) at twice the normal refresh rate - of which more anon.

In fact it's one of the earliest examples of something called IDTV (improved definition TV) to become commercially available in the UK. Terms like IDTV and EDTV (extended or enhanced definition) are not yet precisely defined, but in fact represent several different steps on the path to HDTV (high definition television), which is expected to arrive in the second half of this decade.

If the genuine high definition future still remains rather vague, setmakers are already using the latest technologies to prepare the ground. There are four key components in all HDTV scenarios: doubling the number of lines which make

up the picture (from 525 or 625 to 1150 or 1250), by interpolating an extra line which averages the content of those above and below; doubling the refresh rate of the screen (from 50Hz or 60Hz to 100Hz or 120Hz) to reduce large area flicker; avoiding field interlace and consequent line flicker by scanning the tube continuously from top to bottom; and changing the shape of the screen from the current 4:3 aspect ratio to 16:9.

All of these will be available at the display end of things long before the high definition signals become generally available to provide the full HD viewing experience. Each step (or combination thereof) will nevertheless provide its own improvements, even using existing broadcast signals, and each of the major manufacturers is plotting its own strategy through these intermediate IDTV stages.

To fit two complete frame scans into the time normally used for one, by implication means doubling the overall line scanning rate from the conventional 16kHz to around 32kHz. The bottom line must be to establish whether all this high speed processing is worthwhile. Does the FX29 deliver a better picture? And if so, how does it compare to a normal CTV, and can it possibly justify a thousand pounds of extravagance over a normal television set?

I've scrutinised some twenty modern CTVs in the past year for *Choice* - a mixture of 51cm and 59cm upmarket models from most of the major manufacturers - and as a batch they're pretty good value for their £499, £599 and £699 price points. You get a lot of technology for your money today, especially in historical and inflationary contexts.

Sony's £2,000 FX29 doesn't offer anything particularly special in terms of ergonomics or sound quality. The handset and on-screen graphics are much the same as those used in mainstream Sony sets, which means pretty good but nothing

special. There are a couple of extras over normal sets: a freeze frame, which is both perfect and self-explanatory (though I can't say I've managed to find anything useful to do with it yet); and a digital picture noise reduction system, which does its job but has side effects that to my eyes wipe out the benefits, especially when watching movement.

Since this is a Sony CTV, you get a *Trinitron* tube screen shape, which is different from the other CPTs on the market. In my opinion it's neither better nor worse, the cylindrical *Trinitron* providing perfect vertical geometry at the expense of increasing the horizontal curvature (and hence distortion) to roughly twice that of a normal FST. The choice is yours.

For those foolish enough not to make separate arrangements, the on-set sound is pretty good by CTV standards, helped by the fact that the hinged loudspeakers can be lifted off their mounting studs, increasing separation and avoiding cabinet rattles. Detachable or not, these still have more in common with a good quality stereo radio cassette portable than with even a humble one-piece midi system.

Still, there's just about enough socketry on the set for hi-fi and video buffs to get in and out of the right places, though I wouldn't call the allocation generous. There are two SCARTs, one configured Y/C for component video (Hi-8, S-VHS) feed, the other RGB for home computer or BSB (MAC) satellite use.

The audio amplifier has barely adequate power to drive a decent pair of external speakers to reasonable levels, but

the audio output phono pair takes its feed after the internal audio preamplifier, conveniently retaining the remote volume control. NICAM sound is as good as you'll find built into a TV set.

Picture Quality

Given the above, can the picture quality really be good enough to justify spending an extra grand or more? Much as it pains me to say so, the answer is an unqualified yes, for anyone in the fortunate position to be able to afford it (hence the pain).

Until you've experienced flicker-free, you've absolutely no idea what you're missing. The whole viewing experience becomes much less fatiguing, and picture quality is dramatically improved over even the best conventional sets. This Sony simply provides a much more transparent monitoring 'window' onto the (conventional terrestrial PAL) broadcast signal. And I don't doubt it would be even more impressive fed RGB from a BSB satellite decoder (another luxury I can't presently afford).

This ruthless transparency is less than kind to the limitations of standard VHS video, laying bare resolution and colour registration inadequacies, while emphasising the superiority of the high band component video formats like S-VHS.

'Flicker free' is the buzzphrase used to justify this costly technology, but does tend to understate the sort of improvement on offer here. Wide area flicker is one of conventional television's problems, especially in Europe where the mains (and hence the historical tube scanning) frequency is 50Hz. It's most noticeable on large bright areas of the screen, especially areas of sky. Avoiding flicker is certainly very nice, especially for golf fans, but this only amounts to a small percentage of the improvement in picture quality that the FX29 provides.

One of the most obvious advances is that bright areas no longer glare in the way that normally persuades me to keep the white level (contrast) lower than I would like. Indeed, the whole luminance (relative brightness) dynamic range (grey

scale) seems both better extended and much more precisely differentiated. The consequence is to create an impression of uncanny stability and solidity, even under the compromises of normal terrestrial PAL broadcasts.

Small details spring to mind: the uncanny realism of studio lights glinting in the eyes of presenters, or reflecting off the earrings of (female) newsreaders; the convincing textures of surfaces and reflections in water. Though genuine three-dimensional TV is in no way on the agenda, one is much less conscious of the 'flatness' of the normal TV image, and much more conscious of depth perspectives.

Even though it makes no serious attempt to tackle the limitations imposed by PAL (cross-colour etc.) - or line flicker for that matter - this Sony brings at least as big an improvement to the conventional broadcast signal as that offered as a matter of course by the MAC/RGB signals broadcast from the BSB satellite.

The end result is so infuriatingly watchable, you just sit there hoping your favourite advertisements are going to be screened. This set simply rams home the fact that the adverts have the best production values and cinematographic quality on TV.

Furthermore, the fact that it's dramatically superior on the best quality sources doesn't mean that it's unpleasant on low resolution, noisy pictures. It has a top quality tuner, with an unusually well

Sony 'flicker free' television: how have we managed without it?

designed 'crispener' or 'sharpen' (the video equivalent of a tone control, or more precisely a low pass filter).

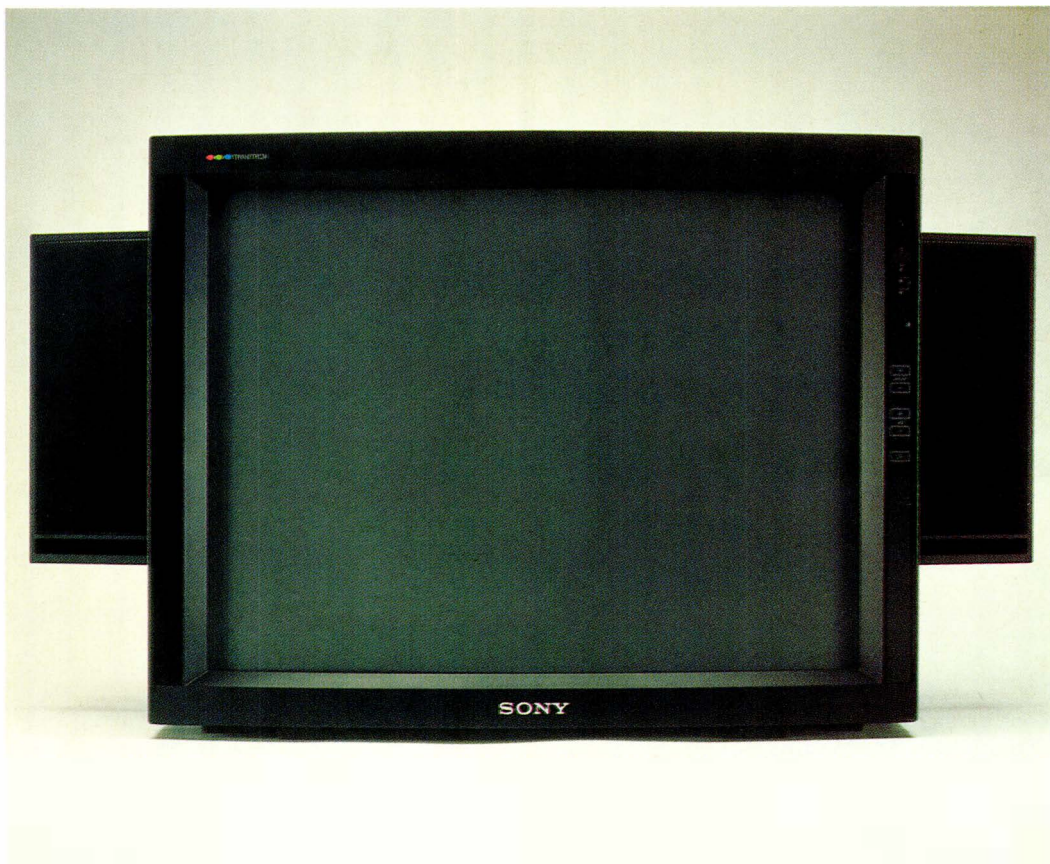
Where cheaper Sony CTVs tend to 'peak up' the upper end of the luminance bandwidth, here the luminance response looks beautifully judged. Reducing the resolution is all that's needed to make lousy signals eminently watchable. Much the same technique makes standard VHS quality tolerable, even though one is aware of the imperfections.

Conclusions

I fell in love with flicker-free display technology when I first saw it at a show some three years ago. Now I've managed to try it out at home, I'm even more impressed by the improvement it offers, especially with high quality picture sources. Indeed, the FX29 makes large screen viewing a positive pleasure rather than a somewhat marginal benefit.

The premium for this feature is currently the best part of £1,000, which is a lot for any enhancement. Hopefully 100Hz scanning technology will become available at a rather more modest price in the not too distant future. In the meantime, the £2,000 Sony KV-FX29 TV is certainly worth having, for those who can afford it.

Paul Messenger



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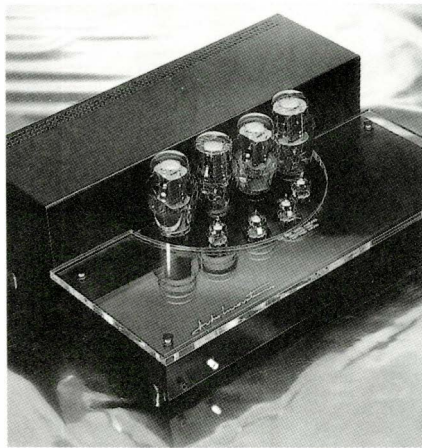
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However, unlike many passive pre-amps, this is not just a "pot in a box". Instead of using a humble potentiometer as a volume control, a high quality stepped attenuator has been used. The result is superb inter-channel balance and unsurpassed control over the volume, especially at low listening levels.

The moving coil step-up transformer (£98.00), the valve phono stage (£320.00), and the passive pre-amp (£145.00) are all available separately (and all have their uses as separate items), or can be purchased together to form a complete and versatile pre-amp.

The price may be ridiculously low for hi-fi of this quality, but you'll obviously want to know more than I can tell you in this ad before investing in any or all of the modules. So if you are considering an upgrade to your system, give me a call or write to me at this address and I will send you free further details. Then you can audition the pre-amp where it really matters - at home in your own system.

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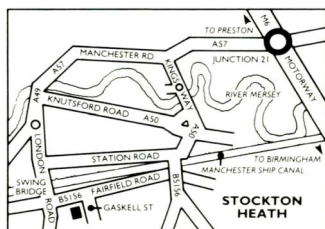
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CD Transport/DAC

Compact disc, once a decidedly hands-offish medium, is certainly becoming more attractive to the enthusiast. Flexibility is the key here, with the emergence of separate transport and DAC systems, which encourage a degree of experimentation. Even so, combinations such as the Teac *P-10/D-10*, placed midway in a range of three digital systems, are still designed to be sold as a pair.

This mutual isolation of respective transport, digital and analogue electronics ensures that each process is accomplished with minimal interference. Corruption which could arise within the common chassis of an integrated CD player is thus avoided. That's the theory anyway. In practice, Teac has certainly gone to town with their *P-10* transport, which features a rather novel inverted disc drive mechanism.

In this instance, the disc is pressed up against the underside of a reinforced turntable 'platter' via a spring-loaded lever. The disc is read from beneath, as usual, but the turntable is driven via a brushless DC motor, located above, and controlled via a series of proprietary servos. Teac calls this a 'zero-wobble' mechanism, a claim that is partially justified by clamping the entire surface (label-side), rather than just the centre of the spinning CD.

Furthermore, the underside of this turntable is very mildly contoured, pressing out any slight eccentricity within the CD. The disc is precisely centred within the mechanism, ensuring that intimate control can be exercised over its rate of rotation. Remember, a CD requires a constant linear velocity as 'seen' by the laser, so in practice, this means that its rotational velocity is always changing.

Accurate control over this, coupled with the lack of vibration within the disc itself (which would place greater stress on the laser's focus and tracking servos) has two main effects. First it sharpens up the RF eye-pattern retrieved by the laser and, secondly, it helps cut down on digital jitter. Jitter, in this instance, manifests itself as a broadening

or uncertainty in the edge definition of successive clock or data cycles.

My own assessment of the *P-10*'s coaxial and optical outputs indicated that jitter was indeed very low, thereby reducing various obnoxious forms of distortion within the partnering *D-10* DAC. Spurious RF noise was also low, suggesting, as was the case in practice, that any isolation afforded by the optical output may not confer any advantage over the 'faster' coaxial output.

Operationally, too, the *P-10* was decidedly slick. Like the *D-10* DAC, it's built onto a narrow but deep chassis and finished off with a luxurious champagne-gold fascia. The limited width of the unit is dictated by the size of the disc assembly within - all we see is an elegant suede-covered loading tray which presents itself at the touch of a button.

Talking of which, it's absolutely imperative not to lose the accompanying remote control, for this plays host to all the features, including some pretty vital ones like the stop button! Direct track access is joined by single/full and A/B repeat, music search and index skipping, in addition to programming for up to 20 tracks. You cannot defeat the slim fluorescent display, I might add, and with basic track and time info on offer, it's a conservative affair.

The *D-10* DAC is equally functional with slim beacons denoting the incoming sampling frequency (ie 32, 44.1 or 48kHz)

Teac *P-10/D-10*

TEAC (UK) Ltd., 5 Marlin House, The Croxley Centre,
Watford, Herts WD1 8YA. Tel: (0923) 225235

together with small LEDs for emphasis and muting. A rotary action selector hops between the two optical and two coaxial inputs, while an additional coaxial digital output allows a tape-monitor loop to be established with a partnering DAT machine. The analogue output is fixed



some +2dB higher than the nominal 2V standard, so beware of superficial A/B demonstrations between this and other players at your dealer.

Inputs from all digital sources are received and demodulated by a Sony CXD1076 interface chip which is mounted alongside the other 'housekeeping' ICs on a separate digital board. A larger board with its own supply and regulation completes the job in hand, with twin 4x oversampling filters and PCM64P 18 bit DACs. A proprietary 'ZDII circuit' introduces controlled amounts of dither prior to conversion to deliberately randomise

quantisation errors at very low levels. The degree of distortion remains the same but its nature is altered, significantly reducing its (subjective) irritation.

Sound Quality

In terms of balance, conviction and sheer



The Teac P-10 CD transport with D-10 DAC: grounds for divorce?

gusto, the *P-10/D-10* combination proved a typical example of top-notch multi-bit technology. It certainly volunteered something of a determined and rugged personality. This was a temperament that placed confidence in strong bass lines and paid credence to the suggestion that multi-bit players can sound that much more 'dynamic' than their bitstream cousins.

Yet dynamic though it was, the *D-10* also proved a little muddy-sounding. In particular, the crispness and transparency enjoyed with simple recordings was rapidly consumed by a translucent fog that accompanied busier-sounding CDs. So, on the one hand, the filigree percussion of Jim Hall's *Cross Court* danced with a light, fresh gait from the speakers, its simple but elegant melody uncompromised by the Teac duo.

Yet the engaging airiness was often all too fleeting. The drum solo from Freddie Hubbard's *Cherokee* was certainly surrounded by a pleasing sense of stereo 'space', but the atmosphere was quickly dulled by the appearance of bass and sax. Instead of cutting through the soundstage, these potent instruments simply crowded the original performers and began to inhibit the earlier ambience of the music.

I should stress that this effect was not

overwhelming, but it was highlighted by the otherwise even-handed demeanour of the combination. As is so often the case, drawing apart one set of curtains may only serve to reveal a further veil over the performance.

This is perhaps the most expedient way of quantifying my mild dissatisfaction with the Teac duo. Otherwise, it's difficult to pin down obvious faults - there's certainly no glaring aggressiveness, imbalance or false 'bloom' to the sound. Nevertheless, I rarely gained the impression of the music hanging together in a particularly wholesome fashion: the ingredients were all there, but the complex relationship between its temporal, structural and emotional elements just failed to materialise.

Meanwhile, a subsequent mix 'n' match with alternative DACs (including Meridian's *203* and Deltec's *PDM One II*) revealed that my earlier reservations were clearly linked to the performance of the *D-10* DAC rather than the *P-10* transport. Indeed, teamed-up with either PDMDAC, the *P-10* transport revealed something of its true colours.

From the first note it was obvious that Teac's *P-10* transport was in another league from its multi-bit DAC.

Immediately, it ushered in a remarkably vivid and powerful sound that was underpinned by an extended bass of frightening depth and solidity. Any haziness was but a memory as the music now seemed that much more transparent, uncluttered and uncompressed. It breathed effortlessly as music took on a smooth yet purposeful conviction that was clearly missing with the *D-10*.

Bolstering the tactility and precise stereo focus that are the hallmarks of a good PDM DAC, this *P-10* transport actually seemed to elevate the performance of these established one bit converters. There was no wholesale change in balance or reproduction, it simply made their most attractive qualities that much easier to appreciate. Testament indeed not only to the quality of Teac's mechanical engineering, but also to their low-jitter digital electronics.

Conclusions

An old adage, usually reserved for analogue systems, concerning the merits of putting the 'front-end first' has more than a passing relevance for this digital duo. Indeed, while the *D-10* converter may only be of serviceable quality, its partner goes some way in defining the state-of-the-art as far as transports are concerned. It's still rather bulky and something of a logistical nightmare to operate, yet perseverance has its own rewards in a remarkably tangible and vivid sound.

Only time will tell if Teac's impending high-end *P-2* transport will offer any significant advantage, other than price, over the *P-10*. For now, the latter remains something of a rare and unexpected treat, though I doubt Teac will thank me for urging its speedy divorce from the *D-10* DAC!

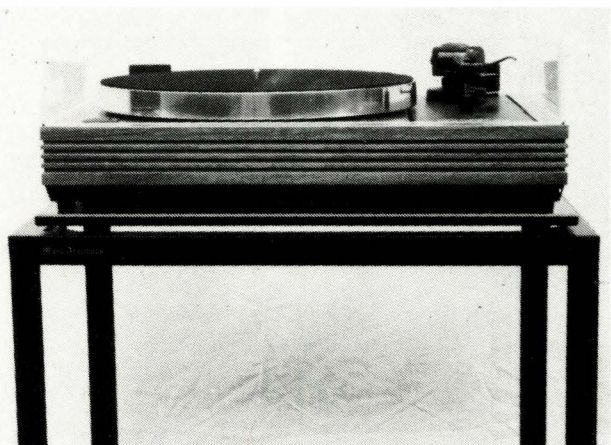
Paul Miller

GENERAL DATA

Laser:	3 beam pickup, 780nm
Coaxial digital o/p:	500mVp-p @ 75ohms
Optical digital o/p:	-9dBm
Sampling Freqs:	32, 44.1 and 48kHz
D/A converter:	dual 18bit 4x
Analogue output:	2.5V, unbalanced
Dimensions (w x h x d) P10:	225 x 138 x 451mm
D10:	225 x 138 x 458mm
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Amplifier

Threshold

FET Ten/SA/4 Stasis

Acoustic Energy Ltd., 3a Alexandria Road, Ealing, London
W13 0NP. Tel: (081) 840 6305

This review covers three items. The first two, the *FET ten/hi* line level preamp and the *FET ten/pc* phono preamplifier (available separately) constitute a complete preamplifier when used together, and are supplied in two identically proportioned slimline boxes, each powered by an outboard supply. The other unit is a large MOSFET stereo power amplifier called the *SA/4 Stasis*.

Build quality is at least a match for other high grade Americana. The thick aluminium fascias with their gold fittings are particularly smart, and in better taste than the description implies. The controls, however, are not an unmitigated success. The central detent on the balance control is at nine o'clock and in practice, hard to see. Other selectors have rather wordy labels, and the combination of a rather stiff action and the smooth finish makes them difficult to handle. Anatomically shaped controls would have been an improvement.

There are five basic inputs, including a disc input which is normally fed by the phono input, but which can act as an extra line input when driven by systems which don't include a record deck. One control which is billed as a 'listening source' selector, is actually a tape monitor switch for two tape decks. The other, labelled 'recording source,' feeds the output of tape deck one to the input of tape deck two or vice versa, and as an alternative presents the currently selected source to both tape inputs. The final front panel control provides mono (described as 'summed mono') switching and a 'shove-

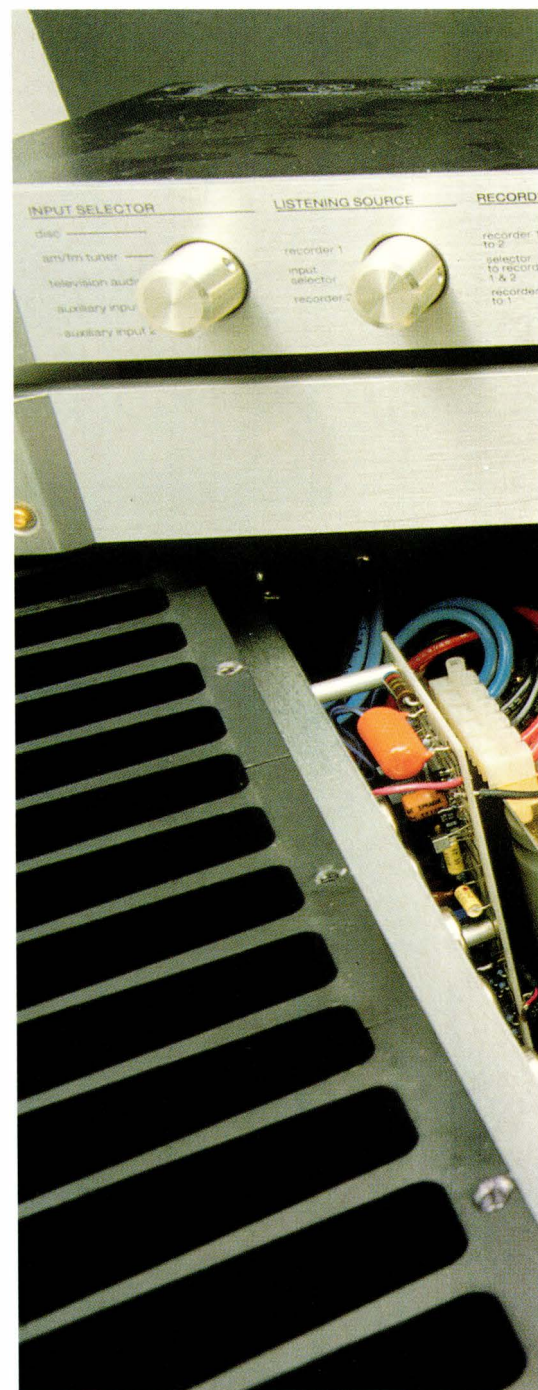
a-sock-in-it' facility, which with unerring wordiness, Threshold describes as 'attenuate 20dB.' The power amplifier is a classic black box, with no user controls.

Balanced leads can be used to couple the phono module (or one other component in non-phono systems) to the high-level preamp, and between the preamp and the power amp, though unbalanced connections can be used in both cases. The power amp can be switched between balanced and unbalanced working. Unfortunately, it's been fitted with awful plain-wire-only screw connectors for the loudspeaker wiring, with smoothly rounded plastic terminal post covers making it difficult to tighten cables effectively. No direct provision is made for bi-wiring. You'll just have to suffer. Of course it's better for us reviewers. We get to suffer and complain so that everyone can hear. . .

Sound Quality

Individually and collectively, these are world-class products. The preamplifier was used for an extended period during the assessment of the Roksan *Artaxerxes* tested on page 118 of *The Collection*, and in the evaluation of a number of CD players from Wadia, Sony, Denon and others. The power amp was used to drive various speakers, including the new Apogee *Stage* (page 50), and the Martin-Logan *Sequel II* (page 89).

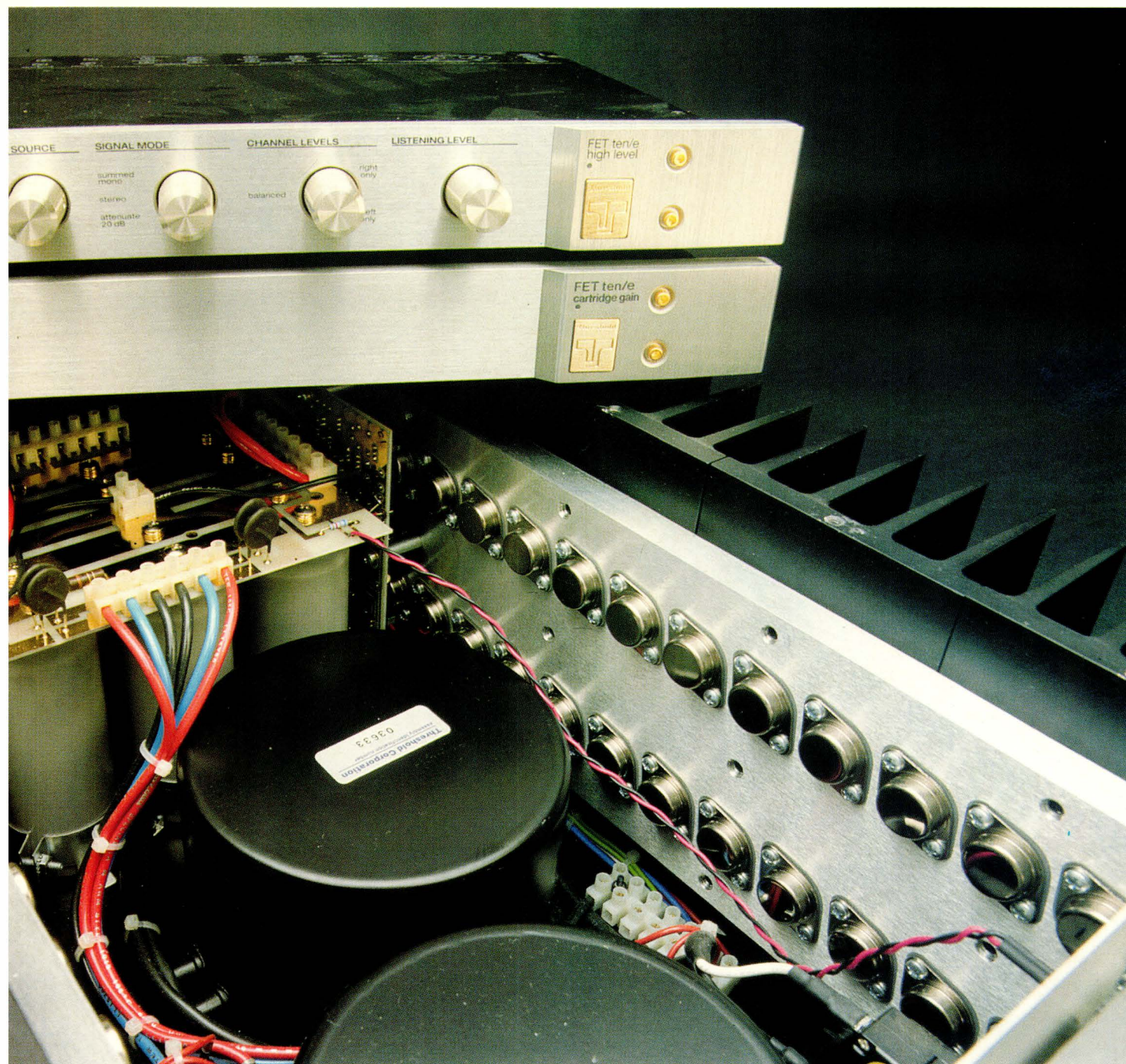
The power amp is big and beautifully put together, as I've already described, and in a way it sounds just like it looks. Music tends to come across with a big



boned feel and the sense of quality, of being well put together, is little short of palpable. What impresses even more is the homogeneity and consistency of the amp, even at very low levels where a certain lack of finesse and clarity is normally expected.

Best of all however is its 'look Ma, no hands!' feel. The ease with which even the most devastatingly high pressure passages are reproduced is nothing less than astonishing, and makes the *SA/4* surely the most valve-like of transistor amplifiers in its class. The effect is seductive and even unnerving, but sure enough, at the right moment when the music toughens, the adrenalin flows.

The preamplifier line inputs present a low 10kohm input load, which could result in loss of output at the frequency extremes, depending on the nature of the



The Threshold combination proves that excellent quality never comes cheaply.

components used to feed it. Advice should be sought on this, but good quality components with short leads appear to cause no discernible loss, though the Roksan *Artaxerxes* is bass light with the Threshold.

This apart, the preamp is hard to fault. Noise levels are consistently low, and the perception of an absence of distortion is complete. More notable still is the almost throwaway ease with which it does its thing, a quality shared with the power amp - and the wide, deep and big-scale stereo soundstage. Again, solidity is the name of the game, the phono module especially offering a more solid sense of musical architecture than the Roksan *Artaxerxes*, though the latter has

compensations (see review on page 118).

Using matched lengths of Time and Space *Pandora* cables in unbalanced and balanced form between pre and power amps (cost £700 per 5m pair!), it was apparent that balanced mode is preferable. The differences are subtle, but balanced mode sounded airier, with greater precision, clarity and soundstaging.

Conclusions

Threshold electronics never seemed to be working very hard, but this, of course, is their real strength: this, and an unusual degree of all-round competence. The prices stretch credibility, but both build and sound quality are conceived for the long haul, and this kind of engineering never comes cheap.

Alvin Gold

GENERAL DATA

FET ten/pc
Input configurable for MC and MM cartridges
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Capacitance: 80pF - 1000pF (adjustable)
Sensitivity: 40dB or 60dB gain
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 <-70dB at 20kHz/1kohm
Outputs: unbalanced & balanced
Dimensions (w x h x d): 48 x 4.5 x 16.5cm
Price: £2,500

FET ten/hi
Input gain: 0dB
Input impedance: 25kohm
Max output: 20V p-p, 100ohm source
Impedance: 20kohm
Dimensions (w x h x d): 48 x 4.5 x 16.5cm
Price: £3,200

SA/4
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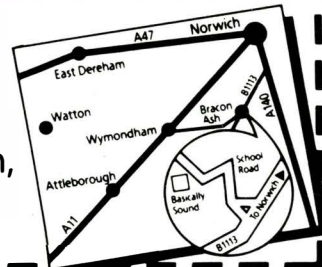
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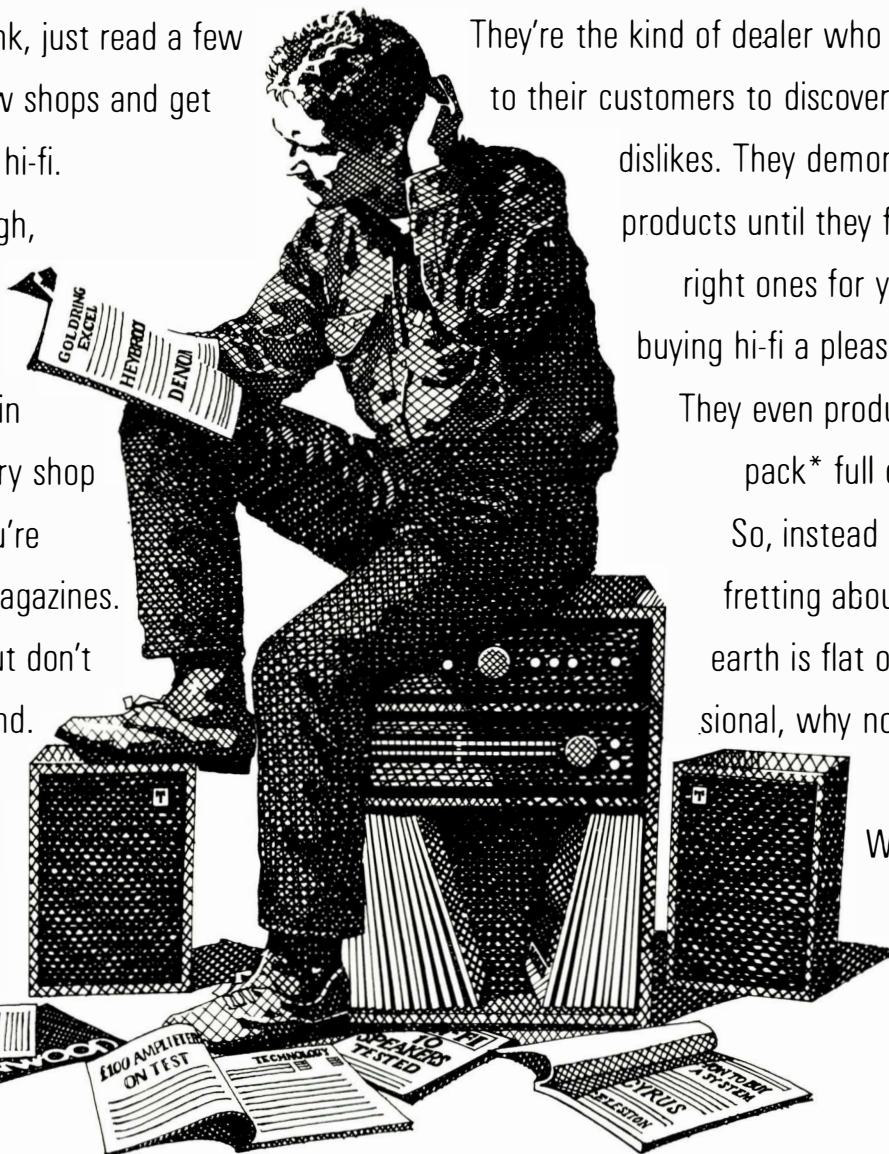
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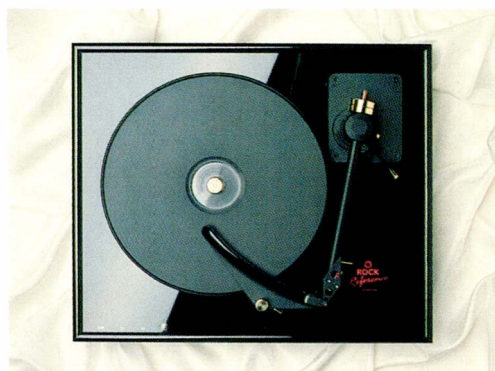
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Townshend *Rock Reference*

D.P. Imports, D.P. High Fidelity Ltd., 106 Victoria Street, Crewe, Cheshire CW1 2JT. Tel: (0270) 211091



The *Rock* design has been around in various guises for several years, all sharing a predilection for composite, highly damped (strictly speaking, 'dissipative') materials and the Cranfield-originated 'Fluid Coupler' trough at the front of the arm. With the possible exception of the ever-popular Linn *Sondek*, I guess no other deck has so strongly divided opinion as to whether it can or cannot work.

According to the inventor and manufacturer, the main argument for the trough feature is that it suppresses the effects of the low frequency resonance caused by cantilever mounting compliance and arm effective mass. In an undamped arm this resonance can cause a frequency response lift of several decibels at 12Hz or so; while tests with a well-damped arm (using front- or rear-end damping) show that this lift can be reduced to fractions of a dB. However, since a tonearm can be considered more or less as a rigid beam at 12Hz, there must be another effect which makes the trough supposedly preferable to rear-end damping. This is that the front-end trough transforms the arm from a cantilever to a beam supported at both ends, and completes the 'energy path' from arm bearing to headshell to trough to subchassis to arm bearing.

Making a tonearm that is rigid across the entire audio band is impossible, since the wavelength of mechanical vibration in even a solid steel arm at 20kHz is very close to the length of an arm and most arms are more or less floppy above 3kHz or so. The aim with the front-end damping arrangement is to reduce effective arm length from 23cm to about 2cm and thus move the arm's maximum frequency of rigid beam operation to above audibility.

Nice theory. But does it work, and are there audible benefits?

Before investigating that, here's a description of the rest of the system. The *Reference* is a heavy lump-

the platter weighing 181b and the subchassis and plinth something like 301b. Both are made of materials chosen more for acoustic 'deadness' than stiffness. The platter consists of layers of bitumen lead and plaster in an aluminium skin, and integrally bonded to a thick PVC mat. The subchassis is plaster-and-lead based with a solid PVC armboard. An 'inverted' bearing gives a bearing point at the centre of gravity of the platter, aiding stability.

The *Rock's* drive system uses the popular Philips synchronous motor, mounted opposite the cartridge and driving the subplatter by a flat belt. An electronic, two-speed, drive circuit is hidden in the rear of the plinth which in turn is powered from an outboard box containing the mains transformer.

Unusually for such an out and out 'audiophile' turntable the control switches are quite sophisticated, consisting of three touch switches on the front of the plinth for Off, 33 and 45. These are illuminated by red LEDs, as is the 'Rock Reference' logo under the arm, and the fancy part is that the brightness of the LEDs is controlled by a light detector to adjust for ambient lighting conditions.

The *Reference* trough is metal and finished in black crackle paint. It's supported on two pillars and locks into position over the record, adding a minute amount of extra stability (the difference is audible if you know it's there). A small outrigger and paddle assembly is supplied for use with any arm other than Townshend's own *Excalibur*, the headshell of which features an integral paddle.

Under the subchassis, isolation is

achieved by three dashpot spring/damper assemblies, and as an extra measure the plinth stands on seven Sorbothane feet. Finish of the whole unit is very good, and although it is pretty much unrelieved black, aesthetic variety is provided by the polished brass knob on the trough locking mechanism, the brass and acrylic screw-down record clamp and of course the illuminated logo and controls. For a unit of its size, the *Reference* is quite elegant, and certainly looks as if it means business.

Minor internal changes and some major cosmetic ones prompted a re-test of the *Excalibur* arm in February 1990's issue of *Hi-Fi Choice*. It's an unconventional design intended for use only on Townshend decks, being shorter than normal by a couple of centimetres, and also having a trough paddle fixed to its headshell. The tube is of stainless steel with internal foam damping, and the bearings are damped. The magnesium headshell is rigidly glued to the arm tube, and has tapped holes to make inaccurate cartridge mounting difficult.

Sound Quality

Before waxing lyrical about this deck, it seems only fair to point out that no deck is perfect. To read some reviews one would think some hi-fi products actually improve the sound they are trying to reproduce, but ultimately the best product is the one that has the least effect on the musical signal. With this in mind it's odd how some components seem to stand head and shoulders above most of the competition.

Nevertheless, the *Rock Reference* together with its *Excalibur* arm does provide a level of performance I have only heard equalled by one other deck - and that's not in commercial production! Within the constraints of what can be cut on to a record it's very difficult to fault the *Reference*, as I'm no longer sure where the limitations of the record player leave off and those of the record cutting system begin. Obvious points: rumble and wow and flutter are what they ought to be in any high-end deck - down around the measurement limits. The disc impulse test



results are good, but not dramatically better than some other decks; however, the subjective test of hitting a record at various points while the arm is down is more impressive, yielding remarkably little sound. Breakthrough is very low, and when measured the effects of the trough can be seen in lowering the level of high frequency arm resonances which are already quite respectable.

Sound quality is definitely very close to the master tape. Original master tapes still have a free and open quality not absolutely rendered by the deck, but for once the true weight of the attack on a piano note is brought across. This attack, though subtle, is very hard to reproduce and therefore an excellent test of reproducing equipment. The difficulty lies in recreating the very low level, low frequency 'thud' part of the note caused by the piano frame, floor and recording venue resonances, without masking it with the dominant part of note due to the string starting to sound.

The *Rock* has been described as sounding 'dry' and 'overdamped'. Overdamped, by how much and at what frequency? A more apt description would be 'controlled', as in the opposite of 'out of control', which by comparison could describe the low frequency response of

practically every other turntable I have encountered. The *Rock Reference* is in a class of its own in recovering bass detail; it's also 'unexcelled', though maybe equalled, in higher frequency regions.

In order to try the *Excalibur* under more exacting circumstances, I played some records without the trough. Yes, the trough does do a good bit to clean up bass and keep transients fresh and uncorrupted, and no, the *Excalibur* arm does not seem to be a weak link in the system chain. Not being able to try it on other turntables, it's hard to evaluate the arm fully, but as it will rarely be used without the front-end damping trough it perhaps suffices to say that it seems uniquely well suited to it and is therefore an ideal choice for the *Rock Reference*.

Conclusions

Expensive it may be, but this system is the essence of what a hi-fi record player should be; in a word, faithful. The feeling of replay equipment character is less with this deck than with any other, and for that simple reason it deserves a confident and unreserved recommendation.

Richard Black

First published in Hi-Fi Choice, issue No. 79

The Rock Reference: controlled and faithful reproduction

TEST RESULTS

Rock Reference	
Type:	belt-drive motor unit
Platter type:	plaster/lead composite, solid
Build and finish:	very good
Mains connection:	connector from PSU
Speeds:	33/45
Wow and flutter (DIN wtd):	0.04%
Speed error:	-0.1%
Rumble (DIN B wtd):	-77dB
Price:	£1,995

Excalibur	
Approx effective mass:	12g
Type:	special for Townshend decks
Adjustment provided:	height, overhang (at base)
Build and finish:	very good
Ease of set-up/use:	fair
Friction approx, lat/vert:	25mg/20mg
Bias force rim/centre (1.5g ellipt):	90mg/180mg
Downforce calibration error (2g):	N/A
Cue rate up/down:	instant/3s
Arm resonances:	good
Arm damping method:	front-end trough (on deck)
Price:	£695

System as a whole	
Size (wx h x d/clearance for lid):	510x210x410/105
Ease of use:	good
Acoustic breakthrough:	good
Hum level:	good
Vibration breakthrough:	very good
Shock resistance:	very good
Subjective sound quality of system:	excellent
Price:	£2,690

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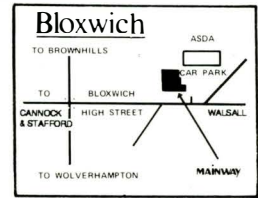
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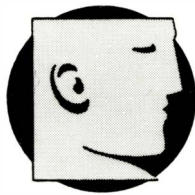
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Voyd Reference

Voyd Turntables Ltd., Unit 20, Elim Works, Dunalley Parade, Cheltenham, Gloucestershire GL50 4LS.
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The Voyd Reference is a serious piece of equipment. This is obvious from its appearance, its price tag (£5,299), its weight and the size of its power supply. Lifting what appears to be a shiny standard Voyd reveals that there is more to the beast than meets the eye. Turning the player on its side, after removing the platter, reveals the most densely packed suspended subchassis turntable you're likely to set eyes on. The motors are by any audio standards huge (90mm diameter), and the subchassis with its three stabilisers is no skeleton either. Couple that lot with a 12mm thick sheet of aluminium, more electronics and a beefy armboard, and there's not a lot of space left inside what is already one of the biggest plinth enclosed decks around.

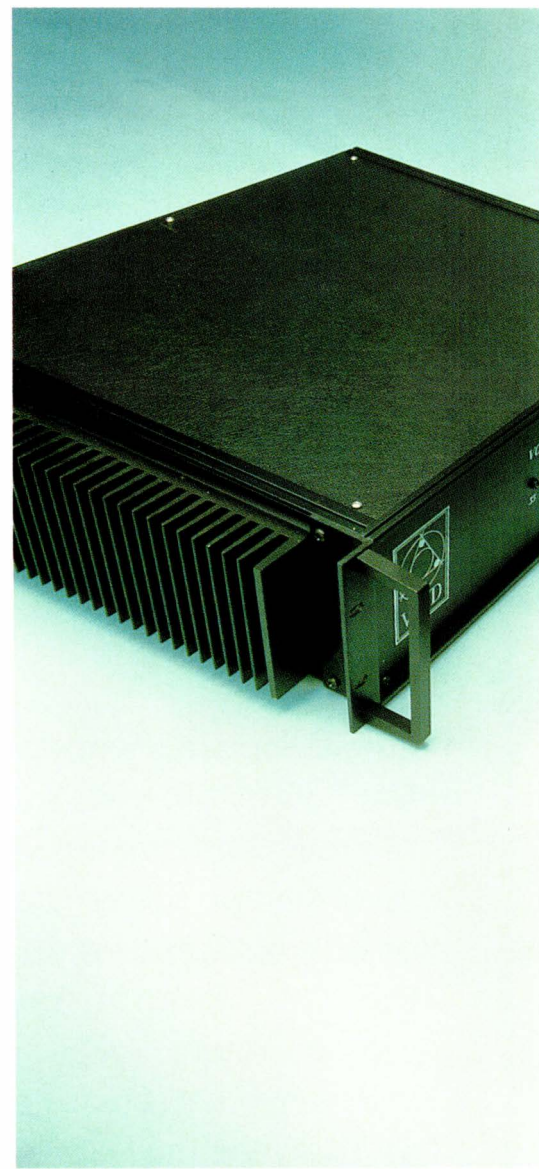
And it doesn't stop there. The power supply does the best impersonation of an expensive power amp that I've seen for some time, right down to a chunky heatsink - all that's missing is some binding posts and phono sockets. It's no coincidence, of course - a power supply is a form of amplifier. It's just one that has to drive DC motors rather than loudspeakers, and when the motors are as substantial as those in the Reference, then the supply has to be equally overgrown.

So what's the point of all this muscle? Well, it goes something like this: there's a school of thought that considers stylus drag to be a major factor in the reproduction of vinyl records. Because of its dynamic nature, the music signal on the grooves of an LP offers a path of variable resistance to the stylus, therefore, depending on the signal being tracked, the stylus will have a greater or lesser braking effect upon the record and, ergo, the platter that turns it. One approach to this has been to produce decks with high mass platters which have enough inertia

to negate this effect, but according to Voyd this type of platter has a natural tendency to store resonances created by the stylus/vinyl interface and reflect them back into the record. What the hefty, external rotor motors on the Reference do is create the inertia you get with a heavy platter design without the mass. Impressive proof of this can be had by trying to stop the platter with your fingers after the motors have been turned off. It ain't easy. This isn't the sort of deck that you turn off between LPs.

The arm on this, and most Voyd Reference turntables for that matter, is the Heliuss *Cyalene*. At just over a grand, it's well into territory occupied by established high end arms like the SME V and not far off parallel tracker country, yet Voyd believes it is the best arm for the deck, regardless of price. To this end, the company builds a special armboard milled out of solid aluminium and incorporates an extra deep collar for the *Cyalene's* large diameter pillar. Like the Voyd, it is quite unconventional in its approach, the unusually streamlined shape and high surface area bearings are designed to channel energy created at the cartridge into the subchassis. The tapered arm tube is made out of two different metals in the form of an inner and outer skin, and because each layer has a different resonant frequency, Heliuss considers that the two are mutually damping. Another innovation is the large flat counterweight that's bolted to the arm with only a small moving component, which means that the weight is as close to the bearing as possible and is as well damped as possible.

Perhaps surprisingly, all this technology has resulted in a deck that's not a great deal more complex to set-up than the humble Systemdek. The subchassis is hung from the springs, so there's no centring of bushes or piston-



like bounce to worry about. I discovered this in the process of substituting an SME IV for the *Cyalene* in an attempt to pin down the characteristics of the Heliuss, more of which later.

Sound Quality

Most of the other equipment used in this appraisal was highly suited to this particular record player, as it comprised the exquisite Audio Note *IO Ltd* cartridge, very esoteric tube amplification and two varieties of Snell loudspeaker (*JII, Type C*) with appropriate cabling and stands (Mana, Pirate, Audio Note).

But that's enough hardware, this machine was designed to play software and that's what it's been doing in every spare moment since it arrived. And doing so in quite a remarkable fashion. More so than any other record player, the Reference gives you the impression that you're only hearing the record and that the turntable, arm and cartridge are contributing so little as to be barely existent. The most obvious indications of this are its immaculate timing, phenomenal accuracy of tonal colouring and the extraordinary dynamic



Voyd Reference with Helius Cyalene tonearm and Audio Note IO Limited: fidelity to the vinyl.

the *IV*'s character was revealed. This better looking and probably better made of the two arms turned in a slightly hurried and warm musical presentation that made the *Cyalene* sound positively neutral by comparison. Records were still highly informative, but they had lost their individuality and sense of ease, the clash of philosophies proving unfavourable to what is by no means a poor component.

At the end of the day...

The experiment above just goes to show how important synergy is: high-end equipment more than any other is sensitive to what and how it's mixed and matched with - the more you spend, the more informed the guy who's selling it to you has to be to give you your money's worth.

The *Reference/Cyalene* combination is all about accuracy, or fidelity to the vinyl it's given to transcribe, and if you just want to hear what's in the grooves on your LPs, you'll be hard pressed to find a turntable and arm that does the job better. Not everything sounds better - of my modest record collection, about a quarter actually sounded less appealing, by that I mean rather compressed and digital, but half of them sounded significantly better and the rest were simply astounding. It's a compromise I could happily live with.

At eight and a half grand (including arm and cartridge), this is a very expensive record player, but in the context of a wide dynamic range, wide bandwidth and with an essentially accurate system, it is most definitely worth it. But don't expect fireworks... unless they're on the record!

Jason Kennedy

range it manages to find in the grooves of well-made LPs.

Timing

Compared to other respected turntables, the *Reference* can sound slow. In fact, it's adding so little that it can express the attack and decay of each note far more completely than other decks. It has the time to give you the full dynamic and tonal depth of the note, and as a result each note seems more drawn out and explicit. This means that when something is played fast, it comes out fast, but the divisions between notes aren't blurred, and when something is played slowly, it comes out, you guessed it, slowly. The *Reference's* character is so benign that whatever mark it does leave on records is very difficult to separate from the faults in the recording, mastering and pressing of the discs themselves. As a result, not all records sound better on the *Reference* and often it was difficult to predict which LPs would benefit the most from this sort of exposure, though on the whole, early generation analogue recordings were the most fruitful with early stereo classical

and jazz records really making the most of the deck's ability to reproduce tonal colour accurately. This is an area in which the *Reference*, at the front of a capable system, really excels. Given a half decent recording, voices and acoustic instruments are so palpable and realistic that they are almost 'there' in front of you.

The above comments apply to the *Voyd Reference, Cyalene* and *IO Ltd* as a combination, because that's what *Voyd* supplied and considered to be the best arm and cartridge for the deck. In an attempt to see whether I agreed with this, an SME armbase was requested, and duly supplied, so that a model *IV* tonearm could be tried out. However, because of the *IO Ltd's* unusual requirements, an alternative cartridge had to be drafted in - the *XX-1L* was to hand and seemed well qualified. Initially, the cartridges were swapped, which resulted in a general lowering of standards, not surprising given the nigh on £2,000 drop in price, but the *Dynavector* put in a good performance by most standards and didn't display any tonal aberrations. Once that had made its aural mark, the arms were swapped over and

GENERAL DATA

Type:	Suspended subchassis/belt drive/3-motor
Speeds:	33.33/45rpm
Operation:	Manual
Dimensions (w x h x d)	
Turntable:	510 x 160 x 420mm
Power supply:	440 x 135 x 350mm
Build and finish:	Excellent
Price:	£5,299
Helius Cyalene	
Type:	non standard/fixed h.shell
Effective length:	251mm
Effective mass - vert./horizontal:	12g/14g
Build and finish:	Good/very good
Price:	£1,066

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FOOD FOR THOUGHT

Many articles are written about Hi-Fi components and systems but very little is written about Hi-Fi itself. An overview of the last few decades in the Hi-Fi industry could give you more food for thought than all the reviews within these covers.

Depending on which publication you read, you may have noticed an increasing emphasis on sonic accuracy as a means of evaluating a products' performance. Natural tonal balance, preservation of dynamic range and correct portrayal of instrumental timbre are ingredients that a system must possess in order to accurately reproduce recorded live musical events. This is what a Hi-Fi system should be capable of doing.

The fifties and early sixties certainly witnessed the golden age of this approach. Many fine amplifiers and loudspeakers were manufactured during this period and some still stand today as state of the art designs. The development of the science of Hi-Fi as a means of recreating the live event took a downward turn in the early seventies when some manufacturers promoted the idea that certain types of colouration could enhance the subjective listening experience. They perhaps did not argue their case in these terms, preferring to use terms such as musicality, but the end result was the same; the widespread acceptance of colouration. This type of system, the inaccurate system, is still prevalent today.

There are, however, designers and manufacturers who place sonic accuracy as the most important design parameter. These manufacturers are gradually coming to the fore and the worth of their work is becoming increasingly valued.

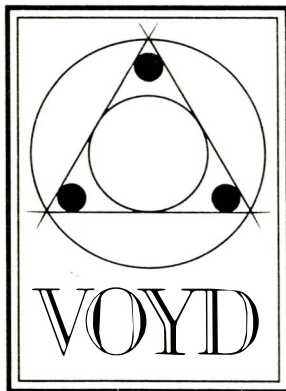
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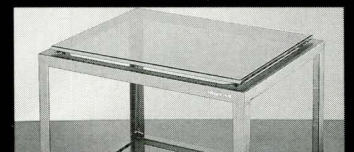
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ARM/CART <i>AT 9SE</i>	ARM/CART <i>BIAS</i>	ARM/CART <i>BIAS</i>	ARM/CART <i>AKITO Linn K5</i>	ARM/CART <i>AKITO Linn K9</i>	ARM/CART <i>AKITO Linn K9</i>
AMP <i>Creek 4040</i>	AMP <i>Creek 4040</i>	AMP <i>Creek 4140</i>	AMP <i>Creek 4140</i>	AMP <i>CREEK 4140</i>	AMP <i>NAIM/NAIT</i>
SPEAKERS <i>Royd A7</i>	SPEAKERS <i>Royd A7</i>	SPEAKERS <i>Royd Conniston R</i>	SPEAKERS <i>Linn Index 2</i>	SPEAKERS <i>Ruark Sabre</i>	SPEAKERS <i>Linn Kan</i>
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SYSTEMDEK IIX900 + AKITO + AT95	add £ 215.00	DUAL CD5150 RC	add £ 130.00
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The 2000/WT-2000 DAC/transport combination is Wadia's flagship, and one of the most costly combinations of its kind currently available. It is also superbly built, using high performance AT&T optical connectors, milled from solid alloy casework for the main components and an internal layout that doubles as a who's who (or what's what) of exotic audiophile components.

The transport comes in a fabricated aluminium shoebox-shaped unit with the disc loading drawer mounted amidships and an outboard power supply dressed to match the main unit. The player offers only the most basic controls (track skip, play, etc.) in its own right, though drawer speed and display level pots are fitted on the back, the latter allowing the display to be switched off entirely. A remote handset fills out the facilities count to roughly industry standard levels. The Teac-based transport incorporates various Wadia-inspired changes.

Housing the power supply separately has had the effect of cleansing the electrical environment and reducing heat build-up within the player housing. The disc platter and clamp have been designed from the ground up to very high standards. Finally, signal transmission to the outside world has been changed to match the Wadia converters. The electrical output is BNC, and a standard optical link has been retained for compatibility. The main output, however, uses glass fibre cable and high grade AT&T connectors, the system offering audibly better results than the electrical or plastic fibre outputs.

The other key component is the Digital 2000 Decoding Computer - the converter itself. It is fed by a large outboard power supply, to which it is connected by three thick umbilicals. Switching is confined principally to input routing and absolute phase inversion, with LED tell-tales for the permissible clock speeds (32, 44.1 and 48kHz) and to show that a signal has been initialised. Balanced (XLR) and unbalanced (phono) connectors are fitted.

To judge the Wadia on its build and its apparent sophistication would be to miss the point altogether. The Wadia is well made, but this doesn't mean that others are badly made, and the sheer complexity of the design could work against it



sonically as it does visually. Where other leading-edge players in the last year have almost all been bitstream, the Wadia employs 18-bit conversion, but with 64x oversampling using proprietary Digimaster filter circuitry optimised for transient rather than steady state performance in recognition of the transient-dominated nature of real music. Current production includes Rocklok input and Sledgehammer output circuitry, previously extra cost options.

Sound Quality

Value for money doesn't come into this, but the Wadia 2000 system represents the present pinnacle of achievement in CD playing hardware. It is far from faultless, but on the whole, the problem areas tend to be musically, if not always sonically, benign, whilst the strengths go further towards closing the gap with the best of analogue than any previous player or technology, bitstream included.

My personal response to the Wadia, for what it's worth, is that it allows a level of emotional involvement and musical insight other players can't even aspire to. How? Simply, the Wadia 2000 does more with compact discs than its competitors. It provides a clearer overview, greater immediacy and a more focused and better

presence of music that is actually happening in a living breathing manner, is nothing less than corporeal. One very obvious reason for this is the bass, which adds to the usual compact disc strengths - great depth and tunefulness - a physical quality composed partly of unusual weight and partly of a real feeling for the complex tonal and dynamic relationships that set real music apart from the prepackaged alternatives. It is in this macro view of the music that the Wadia is

clearly superior to the competition.

Conclusions

As the man in the tyre advert says, this is gripping stuff. The obvious objection is that with the present pace of developments, it is quite likely that the Wadia won't remain state of the art for long, and value for money is clearly not its forte. But even these objections are partly countered by the high level of upgradeability inherent in the design and by the importer's policy of upgrading equipment in the field, often free of charge. The Wadia 2000 player exemplifies the current state of the art.

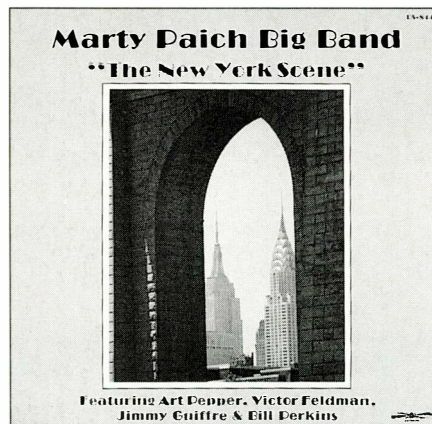
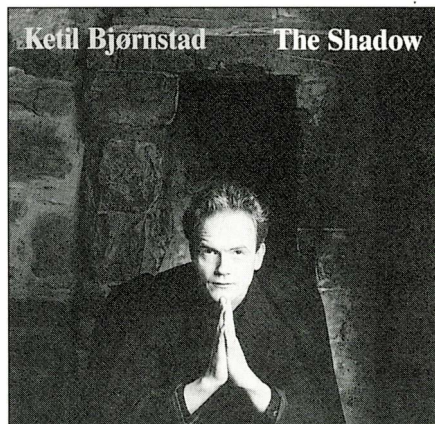
Alvin Gold

GENERAL DATA

WT-2000 CD transport	
Outputs:	glass fibre/AT&T connector standard plastic fibre optical electrical BNC outboard power supply
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As top-quality 'audiophile' recordings seem to be becoming more and more difficult to find in High Street record shops, *Hi-Fi Choice* is making a determined effort to source some of the best recordings from around the world and make them available to readers by mail order. You might stumble across one or two of these records in some specialist record shops, but for the most part these records and/or CDs are not readily available in the UK. You certainly won't find them in your local record store! We have already added many exciting discs from specialist American record labels such as Reference, Wilson and Sheffield - and we expect our catalogue of LPs and CDs to expand considerably during the next few months.

RADKA TONEFF: Fairytales

Ref LP1 £12.95

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The well known audiophile (digital) recording of female voice and piano. Worth the asking price alone for the opening song, *The Moon's A Harsh Mistress*. Odin CD03/LP03

ARNE DOMNERUS' KVARTETT:

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Ref CD34 £14.95

A selection of Grieg 'miniatures', imaginatively arranged for a jazz quartet. Superbly vivid sound. (Available on CD only.)

For-X, FXCD65.

KETIL BJØRNSTAD: The Shadow

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Ref CD35 £14.95

Recorded in Oslo and released earlier this year, *The Shadow* features the delightful voice of Randi Stene in a collection of compositions inspired by the Poems of John Donne. Bjørnstad is one of Norway's finest session players. For-X, FXLP93/FXCD93.

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SMITH/RICCI: Paganiniana

Ref LP10 £14.95

Ref CD10 £17.95

Breathtaking purist analogue audiophile recording of classical works performed on piano and violin. On the

American Water Lily Acoustics label, recorded by Kavi Alexander and sponsored by Conrad-Johnson. An essential addition to any audiophile's collection. Water Lily CJCD/CJLP

TOTTI BERGH: I Hear A Rhapsody

Ref LP4 £12.95

Ref CD4 £14.95

On the Gemini label, saxophonist Totti Bergh plays a selection of jazz standards. *Jazz Journal* magazine described this as "A delightful 'wee small hours' album". Gemini GMCD48/GMLP48

MARTY PAICH BIG BAND: The New York Scene

Ref LP13 £12.95

Featuring Art Pepper, Victor Feldman, Jimmy Guiffre and Bill Perkins, this soundful set includes extended modern stylings of some classic Broadway musical tunes by the likes of Cole Porter and Rodgers & Hammerstein. Discovery DS-844

MARTY PAICH: What's New

Ref LP14 £12.95

Another superb recording of big band 'swing' jazz, this time featuring mostly Marty Paich original compositions. It doesn't seem possible that this was recorded in 1957. Like *The New York Scene* LP, which dates from 1959, the

sound is quite breathtaking: vibrant, dynamic, and with a superbly natural soundstage. They knew what they were doing in those days. Discovery DS-857

OPUS 3 TEST RECORD 1: Depth Of Image

Ref LP11 £12.95

Ref CD11 £14.95

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. Opus CD7900/LP7900

OPUS 3 TEST RECORD 3: Dynamics

Ref LP12 £12.95

Ref CD12 £14.95

Another compilation on the Swedish Opus 3 label, 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? Opus 3 CD8300/LP8300

GREX VOCALIS: Renaissance For Kor

Ref CD15 £14.95

A capella performances of Renaissance and medieval songs, beautifully recorded in natural acoustic

environments for the Norwegian For-X label.

(Available on CD only.)

CD: For-X FXCD39

YTRE SULOENS JASS-ENSEMBLE / BARBARA ANN SHORTS: A Stone For Bessie Smith

Ref CD16 £14.95

Blues and gospel singer Barbara Ann Shorts, backed by a small jazz ensemble with musical roots in the New Orleans tradition, plays tribute to the great US blues singer Bessie Smith who died in 1937. This collection of songs includes a fascinating re-working of Sting's *Moon Over Bourbon Street*. (Available on CD only.)

For-X FXCD69

ROAR ENGELBERG / STEIN-ERIK OLSEN: Mosaic

Ref CD17 £14.95

Scandinavia's only professional pan flautist, Roar Engelberg, plays a collection of arrangements with Stein-Erik Olsen (classical guitar) — pieces by Ravel, Bach, Faure, Desportes and more. Superb dynamics!

(Available on CD only.)

For-X FXCD81

JIM BROCK: Tropic Affair

Ref CD18 £15.99

Ref LP18 £15.99

Vibrant contemporary jazz, recorded live to two-track by Reference Recordings' Prof. Johnson. Remarkable clarity and a tremendous 3-D soundstage. RR31



WILLIAM WALTON: Facade Suite

Ref CD19 £15.99

Ref LP19 £15.99

One of the Reference label's earlier analogue recordings (these days the company concerns itself with improving digital techniques), featuring the superb playing of Chicago Pro Musica. "A true state-of-the-art recording", said *The Absolute Sound* magazine. RR16

STRAVINSKY: L' Histoire du soldat Suite

Ref CD20 £15.99

Ref LP20 £15.99

Chicago Pro Musica again. The US underground magazine *The Absolute Sound* reckoned this to be one of the best (analogue) recordings ever made! RR17

VIVALDI / BACH: Sinfonia in C; Trio Sonata in C, etc

Ref CD21 £15.99

Ref LP21 £15.99

An exemplary digital recording of the Helicon Ensemble playing Baroque music from Vivaldi and Bach. The CD contains an extra track, Bach's *Prelude in C*. RR23

COPLAND: Appalachian Spring Suite

Ref CD22 £15.99

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JAMES B. WELCH: Concert

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Ref LP25 £15.99

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W177, W278, WCD177/278

The Choir of Grace Cathedral, San Francisco

Ref CD26 £15.99

Ref LP26 £15.99

W805, WCD794/805.

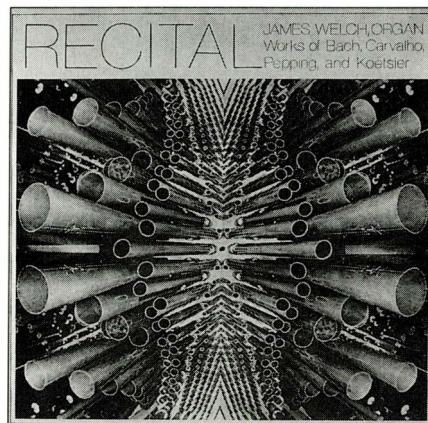
Another breathtaking example of Wilson Audiophile's pure analogue recordings, used as reference discs by hi-fi gurus around the world. The discs are hard to find in the UK.

THELMA HOUSTON & PRESSURE COOKER: I've Got the Music In Me

Ref LP27 £15.99

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One of Sheffield Labs' most famous recordings. The original direct-cut has been out of print for many years and is now highly collectable — but the recording sessions were of course taped, and this issue will still blow



your socks off! Sheffield ST200, CD2.

Listed below are further highly collectable Sheffield Labs discs which are astonishing in their sense of realism and truly awesome dynamics:

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Ref CD36 £15.99

TLP29, CD29

TOWER OF POWER: Tower of Power Direct

Ref LP37 £15.99

Ref CD37 £15.99

LAB17, CD17

JIM KELTNER & RON TUTT: The Sheffield Lab Drum Record

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LAB14, CD14/20

The Sheffield Lab Track Record

* The CD also includes 'The Sheffield Lab Drum Record'

Ref LP31 £15.99

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LAB23, CD23.

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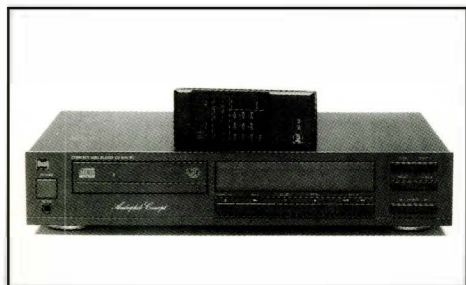
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