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# It's a Peach

## The new Naim CDI

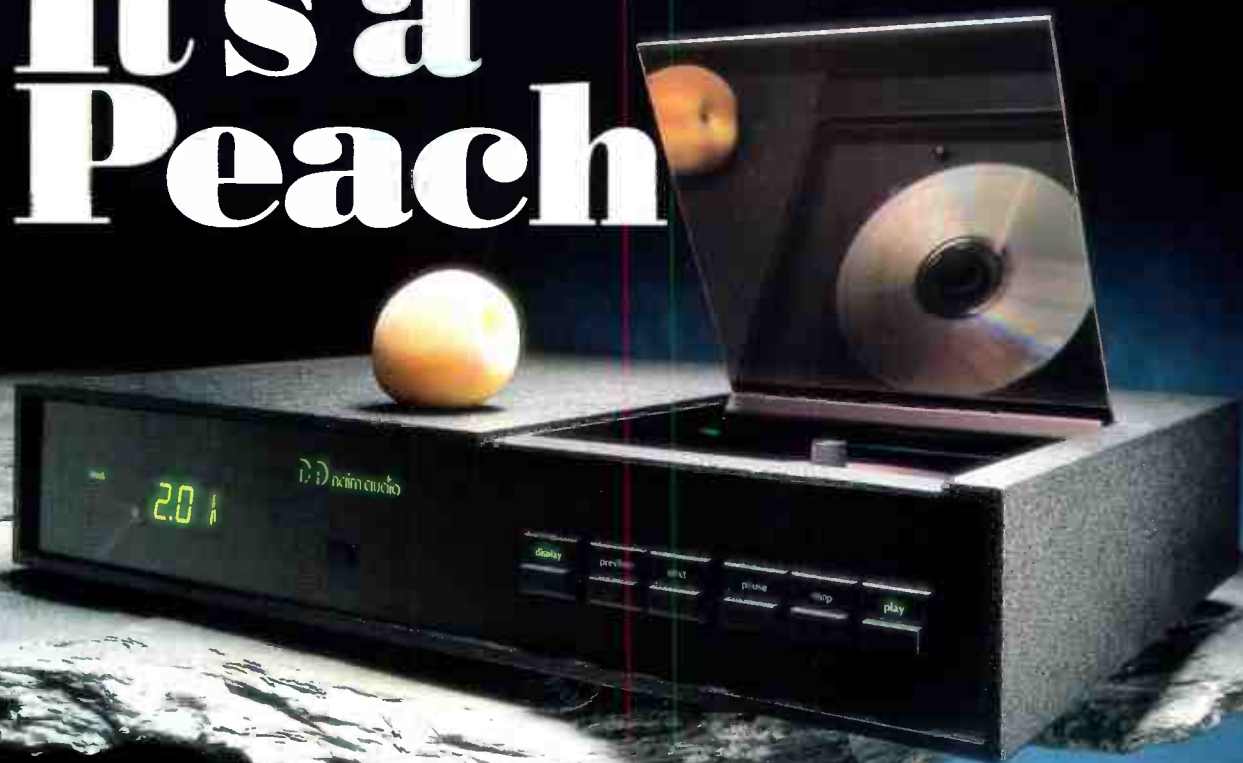
Getting things right the first time is a tradition at Naim Audio.

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# THE LISTENER

## You'll hear better if you use your head

Ringling telephones, vacuum cleaners, traffic — and you thought CDs meant the end of background noise. Think again.

At Sennheiser we have been putting thought into producing high-quality headphones since the HD 414s (released in 1968). We're also highly thought of — worldwide critical acclaim has included six awards in *What HiFi* magazine.

The new Sennheiser range continues to excel in terms of sound quality. All our headphones come with a two year warranty, plus our assurance that all parts are and remain replaceable (nearly a quarter of a century on, spares are still available for the HD 414s). And with all products entirely developed and manufactured by us, backed up by 100% quality testing, the craftsmanship is guaranteed too.

That's the background. Now listen. Unbeatable sound quality — no noise.



**Sennheiser —  
the thinking  
man's  
headphone**



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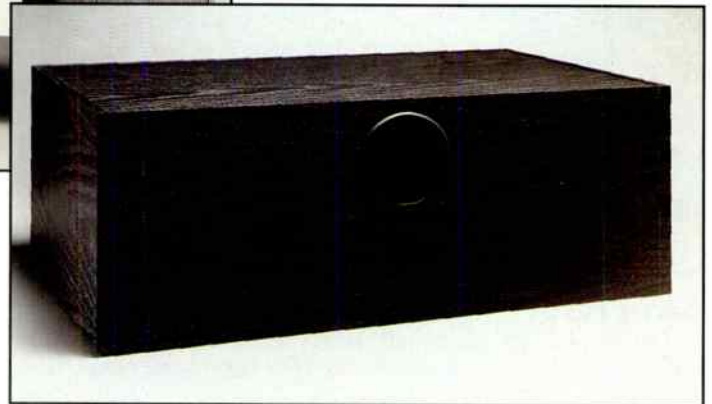
## MORE BASS FROM CELESTION

Celestion are bringing out three new loudspeakers. First on the scene will be a subwoofer for the Celestion 3. Finished in black ash, the £129 CS135 is a ported enclosure 190mm x 520mm x 340mm, which can be placed either horizontally or vertically. Inside the box is a new 200mm felted paper cone bass unit with a dual voice coil which sums the left and right signals. Crossover frequency is 112Hz using an acoustic second order (12dB/octave) low pass filter for the subwoofer. Multiway binding posts provide the stereo output for the satellite speakers via a passive first order (6dB/octave) high pass filter. Sensitivity is 86dB, power handling 90watts per channel.

Celestion's other two new arrivals are floor standing designs. The 15 is a two-way design using Celestion's 1in titanium dome tweeter and a 6in felted fibre cone bass/mid driver in their own enclosure. This vents through a port into the lower part of the cabinet, which is constructed of 15mm high density particle board and available finished in either simulated black ash or oak veneer. Spikes are supplied. Price will be £349.

Finally, the last in the new line-up is a completely new departure. It's a Celestion transmission line! Celestion have used their famed computer modelling to obviate, they say, some of the problems previously experienced in transmission line designs. Drive units are not dissimilar to those used in Celestion's 100 design, namely a 1in aluminium dome tweeter and a 6.5in cast bass unit. Construction is of 16mm MDF with a 23mm thick front baffle internally braced. Called the 300, it stands 38.2in high with a relatively small footprint, only 8.3in wide and 12.8in deep. Finished in real wood veneer, cost is £999 for black or walnut and £1099 for mahogany.

Contact Celestion International Ltd., Ipswich IP3 8JP. Tel: (0473) 723131.



## WACKY NAK

Nakamichi - they of the brilliant high-end tape decks - have joined the Lifestyle brigade with a new all-in-one system nick-named the Wakimichi. No, we don't know why, it's not small enough to walk around with.

Comprising a side-loading Compact Disc player which can hold and store seven CDs, a 35watt amplifier and FM tuner (Wow! no cassette deck?) it has the same curvilinear style as Nakamichi's latest separate devices. Finish is rubberised grey, with some very nacky - sorry, natty - yellow and red control buttons. With speakers, styled to match, the Sound Space 7 or Wakimichi or whatever, costs £1295.95; without, price is £995.95.

Contact B&W Nakamichi, Marlborough Road, Lancing, West Sussex BN15 8TR. Tel: (0903) 750694.



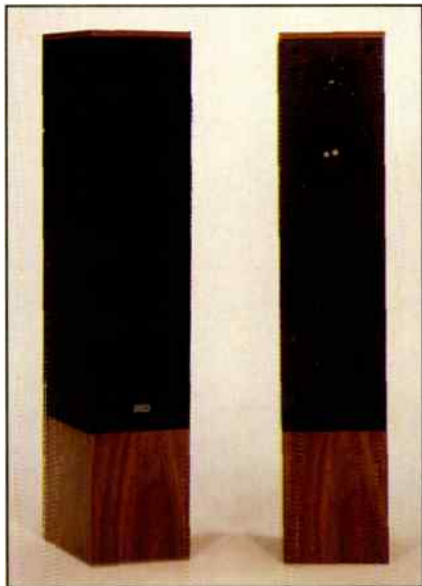
## CASTLE YORK

Castle Acoustics have added to their loudspeaker range with the stand-mounted York. A two-way, reflex-ported design with a power handling capability of up to 100watts and overload protection for both drive units, the York costs £320 and is finished in black ash wood veneer to the usual high Castle standard. Other veneers increase the price to £340.

Contact Castle Acoustics, Ltd., Park Mill, Shortbank Road, Skipton, North Yorks. BD23 2TT. Tel: (0756) 795335.

## TWO NEW SD BABIES

SD stands for Steen Doessing, who has added a new speaker (and a new daughter, says the press release) to his range. New is the 3' 6" SD4, floorstanding and veneered in either walnut or black ash. Efficiency is 86dB, price is £699.95. "There was a fair amount of wailing and gnashing of teeth during the design and prototype stages, but I'd sooner be manufacturing loudspeakers than giving birth the natural way," said the father. SD loudspeakers (but not daughters) are distributed by Ortofon (UK) Ltd., Chiltern Hill, Chalfont St. Peter, Bucks. SL9 9UG. Tel: (0753) 889949.



## AVONDALE LINN UPGRADE

Avondale Audio have announced an upgrade for the Linn LP12, consisting of a new stove enamelled steel top plate and sub chassis made from a composite of glass filled resin steel and aluminium fitted with a precision machined bronze bearing and Swiss motor and pulley. The motor is mounted directly on the sub chassis. New springs with acrylic bushes and a laminated arm-board with new feet, either plain or pre-drilled to order, are also provided.

The assembly is pre-wired, installation being a matter of substitution, using the original platter. Avondale say that since the original Linn top plate and components are unaffected, the turntable can be returned to its initial state at a later date. Price of the modification is £568 with an additional delivery charge of £5 for the U.K.

Contact Avondale Audio, The Hollies, Avondale Road, Chesterfield, Derbyshire S40 4TF. Tel: (0246) 200096.

## PRICE NOT RIGHT

Dealers in London's major electronics street, Tottenham Court Road, have been breaking the law, says the London Borough of Camden. After complaints from customers, Camden's Consumer Services Officer, John Wilson, swept through eighty shops and found prices were not clearly displayed on electronics for sale on the shelves. Two weeks later, fifty six out of eighty shops were still not showing prices; retailers have countered criticism by saying that rivals undercut them if they show what they are charging.

"People want to know what prices are without having to ask all the time. Then they can decide for themselves where to make their purchases," said John Wilson. Camden warn that if prices are not clearly shown traders face a fine of up to £2000.

## SONIC LINK RHODIUM

Rhodium plated connectors are better than gold, say Sonic Link, who have just introduced a new range. Like gold, it doesn't tarnish, and Sonic Link claim superior sound quality. Connectors range from a 3.5mm jack plug at £3, a 13A mains plug at £12.50 and a set of four banana plugs at £10 up to interconnects and 5m of Blue/Yellow bi-wire speaker cable terminated with Rhodium plugs at £230.

Contact Sonic Link, 6, Derwent Business Centre, Clarke St., Derby DE1 2BU. Tel: (0332) 674929.



## DAT'S LESS

As Digital Compact Cassette and Minidisc peer over the horizon, Casio have announced a price reduction for their two Digital Audio Tape recorders, the DA-7 and DA-R100. Cost of each is now down to a very competitive £399 - less than the projected price of Philips' first domestic DCC machine.

Contact Casio Electronics Co. Ltd., Unit 6, 1000 North Circular Road, London NW2 7JD. Tel: (081) 450 9131.

## JBL UNDER CONTROL

JBL have brought out a six-unit loudspeaker system for those who want a surround-sound set-up in the home. The Control Series system comprises the small JBL Control 1's for the main stereo pair with their associated SB 1 subwoofer and three Micro speakers for the rear and centre dialogue channels. Price, we were told, is £304.

Contact Harman Audio, Mill Street, Slough, Berkshire. Tel: (0753) 576911.

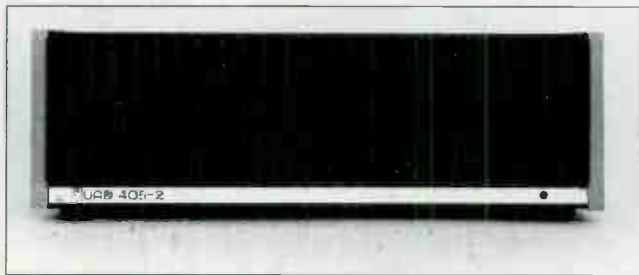
## GOLDRING DO THE WASHING

Goldring have announced a comprehensive new range of Discwasher CD care products. Among others, there is a motorised CD Cleaner at £16.99, a Laser Lens cleaner for £16.99, C Deez Polishing Wipes for £2.99 and a Discstick (clever, what?) CD cleaning pen for £5.99.

For details, Contact Goldring Products, 8 Greyfriars Road, Bury St, Edmunds, Suffolk IP32 7DX. Tel: (0284) 701101.



## IN BRIEF



### THE LAST 405

Quad are ceasing production of the Quad 405 power amplifier - first introduced in 1976 - with No 100,000. It could be yours! It is on offer to the highest bidder. Proceeds will be donated to the Parkinson Disease Society. Send a sealed bid, in writing - but not a cheque - to **Ross Walker, Quad Electroacoustics Ltd., Huntingdon, Cambs.** The envelopes will be opened at midday on Friday 31st July after which date the winner - and losers - will be informed by Quad.

### HOW TO BADGER BADA

Problems with a BADA dealer? The British Audio Dealers Association have set up a public telephone Help Line. You can now talk direct to **Mike Lewin, BADA's Operations Officer, on (071) 226 4044.**



### SONY CANS

Not headphones - cans of Pepsi. Money-off vouchers with selected Sony audio and video tapes allow a customer up to £4.50 off multipacks of Pepsi, diet Pepsi and Caffeine-Free diet Pepsi. The hot offer began at the beginning of June. Let's hope the weather stays hot, too.

### MERIDIAN MANAGE BUY-OUT

Meridian, placed in receivership by parent company AGI at the end of April, has been rescued by a management buy-out put together by **Bob Stuart** whose family will take up 88% of the equity.

### REVOX LICENSE DCC

Revox have licensed Digital Compact Cassette technology from Philips. For information on future DCC machines. **Contact: Revox U.K. Ltd., 1 Berkshire Business Centre, Berkshire Drive, Thatcham, Berkshire RG13 4EW. Tel: 0635 876969. Fax: 0635 872556.**

### AUDIO NOTE

Latest in a never-ending series of number changes comes from AudioNote UK Ltd. **New telephone number is 0273 220511; new Fax number is 0273 731498.**

### LINN CLINIC AT GRAHAMS

During August, Linn turntable owners can have their LP12s re-set free of charge, except for the cost of any replacement parts required, at **Graham's Hi-Fi Ltd., Canonbury Road, 190A New North Road, London N1. Phone (071) 226 5500** to book an appointment with the surgeon.

### CLEAR TONE AT G-MEX

Northern dealers Cleartone, who have had their own annual hi-fi show at The Last Drop Village near Bolton, are instead joining up with the Northern Video, Hi-Fi and Home Entertainment Show at Manchester's G-Mex Centre this year. Dates are September 18-20.

**Contact Ray Nugent or Roy Axon at Cleartone on (0204) 31423 or Rob Lehmann at WV (071) 485 0011 for details.**

### DOUBLE (MUSICAL) IMAGE

Musical Images Ltd. have opened a second shop at **173 Station Road, Edgware, Middlesex HA8 7JX. Tel: (081) 952 5535.**

### US CABLE IMPORT

American XLO Reference Series cables are being imported into the UK by Wollaton Audio. Specifically designed for its intended use, internal construction is dictated by the requirements of the signal. Two types of loudspeaker cable, a digital transport-to-processor and analogue interconnects are available in the Reference Series range; there is also a cheaper Pro Series.

**Contact Wollaton Audio, 134 Parkside, Wollaton, Nottingham NG8 2NP. Tel: (0602) 284147.**

### JVC MOVE INTO BEIJING

No 5 Dong San Huan Bel Lu in the Chao Yang district of Beijing is the address of JVC's new China office. The Japanese company has already contributed to the development of the colour TV industry in China which started in 1979 and has its eyes on a huge potential market for audio and video.

### NO SHOW FOR HARROGATE

The 1992 Audio and Video Fair originally planned for Harrogate in early August has been cancelled through lack of support. Rumours abound of a smaller, specialist show being provisionally planned for 1993, but as yet nothing has been confirmed.

### MAGNUM FORCE

Hailey Audio Ltd. have been appointed sole distributors of the Magnum amplifier range. Hailey are also distributing the REL subwoofers in the U.K., and will be bringing in a new range of speakers by U.K.D. with English-designed electronics built into solid Italian walnut cases.

**For details contact Hailey Audio Ltd., 328 Ware Road, Hailey, Hertfordshire, SG13 7PG. Tel: (0092) 714 811.**

### REWITABLE PAL FROM PIONEER

Pioneer launched the first PAL rewritable Videodisc recorder in Amsterdam in July. A unique dual-head design allows simultaneous erasing and recording. No further details or prices as yet.

### MASTER CRAFTSMAN

Doug Dunlop, of Concordant Audio has recently become a Member of the Guild of Master Craftsmen. His range of fine valve preamplifiers, modified Quad II power amplifiers and solid state power amplifiers are well worth a crafty look. **Tel (0455) 843752 for more details.**



a couple of alkaline batteries (e.g. Duracells or Gold Seals). We are told DCC recorders will have a similar performance, so they could have double the battery life of MD players.

The other potential problem - of track skipping when the player is jolted - Sony claim to have overcome. To allow an MD player to be used on the move, like a Walkman, Sony have equipped it with a memory to keep the music playing while the laser head is returned to its original position after a jolt. Whether an MD player will be able to cope with a jogger nobody yet knows.

Prices were much as expected, blank tapes being quoted as £4-£5, prerecorded discs the same as normal CDs (i.e. £10-£12). The machines themselves will range from £350 for a recorder down to £240 for a replay-only portable.

Sony had mustered their arguments well. They had an answer to every criticism of MD - and reasons why the apparent attractions of DCC were more imaginary than real. In a nutshell, they said that tape as a medium was

## Sony MiniDisc set to launch

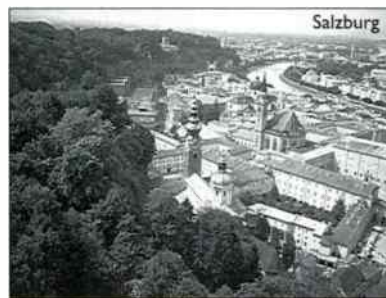
Sony ended its perplexing silence on progress in MiniDisc (MD) development by holding a Press conference in Salzburg, Austria, to restate its commitment and provide more information on the new system. They made the assurance that MiniDisc will be launched in Europe by Christmas 1992.

MiniDisc is a new, miniature form of Compact Disc - but one that will record. It's intended to replace the cassette. This puts it into direct competition with Philips' intended replacement, Digital Compact Cassette (DCC), also to be launched at the end of 1992, probably a month or two earlier than MD.

Sony's restatement of the merits of their new technology had the effect of underlining its future potential. The disc is permanently housed in a protective plastic sleeve, like a computer floppy disk. This makes it as durable as a cassette but it is much smaller at around half the size. This is one useful advantage MiniDisc has over its rival from Philips, since DCC is roughly the same size as an ordinary cassette. With a long playing time of 74 minutes and very fast access of under one second to reach any track on a disc, this new format has some great strengths.

I had suspected that recording would be expensive in batteries, but they stated specifically that this wasn't a problem. When recording the laser did not consume significantly more power. Pressed hard by a doubtful journalist, Michael Schulhof, a U.S. Director of the Sony Corporation, quoted power consumption as 1.5watts, giving a recording and playing duration of 1.5-2hours with rechargeables. Sony UK told me that alkalines would give more life, around 3-4 hours being expected.

That's not a lot. A portable cassette recorder manages 5-8 hours on



less attractive than disc, mainly because of its relatively long access times. Disc was the medium of the future, hoards of sceptical European journalists were told.

If that one didn't get swallowed wholesale, their assertion that MD was "sexy" (the latest in trivial marketing phrases) most of us did have to go along with, even if the

expression seemed to irritate the UK journalists without exception. That MD appears technologically novel, mainly due to its small size, none could disagree with. In its use of full size cassettes, DCC may just be perceived as less attractive by potential buyers and this may work against it quite strongly.

The need to have prerecorded discs in the shops before people feel able to consider buying a new medium like MD Sony have accepted, albeit with reluctance. They still suggest that the ability to record is more highly valued, whilst at the same time producing lists of music companies that have agreed to provide music for use on MD. In spite of these assurances, many suspected that prerecorded MiniDiscs are likely to be more scarce than prerecorded DCC tapes, at least in the early days.

A common fear is that MiniDisc will destabilise the Compact Disc market. Most people I have spoken to feel it is more attractive than the full sized CD and, ultimately, people will buy it in preference to CD. Should this happen, then CD sales will go into decline relatively early on in the medium's life, producing dissatisfaction or anger amongst the public.

No one appeared very happy about this prospect. Sony tried to convince us that MD is meant to be a portable version of CD and was intended to provide 'sound on the move'. Yet MD is totally incompatible with CD; it cannot be used in ordinary CD players. The distinction between the two mediums is meant to be enhanced by a new development in CD called by Sony 'Super Bit Mapping', but few feel that this will be enough to distance CD from MiniDisc in terms of sound quality, persuading people to buy both. Even the most enthusiastic and vociferous UK journalists appeared to be suffering 'format fatigue' after the conference. When I asked them what they personally preferred, I got resigned looks and meaningful answers like "I dunno." The presence of LP, CD, DAT and - now - DCC and MD, on the market, together with all the arguments that surround them, seems to have overwhelmed even hardened observers. If it does the same to everyone else, both DCC and MD might share the same future as DAT ●



Sony MiniDisc portable recorder with prerecorded disc and blank disc.



In a move that struck us as mighty peculiar, a little known US company called Kinergetics announced recently that it had bought KEF, the UK loudspeaker company.

What's peculiar about that? Well, Kinergetics aren't - er - the world's best known company; in fact not many people in Britain have heard of them.

And as if KEF wasn't enough, they are in the process of buying Celestion as well. Hell's teeth, we thought, don't they know that stereo needs two loudspeakers - not two loudspeaker companies!

Wanting to see what sort of person does such things, we wound up the elastic on the editorial jalopy and made it down to Maidstone in Kent. There were some surprises waiting for us.

As we arrived a blue London cab was waiting at the company's entrance - waiting to take one of the most interested and influential of the new investors back to Hong Kong: Victor Lo. Of the many players involved, he looms largest, and for good reason. The Lo family, based in Hong Kong, privately owned Gold Peak Industries (GPI) until it went public seven years ago. This company claims to be the world's second largest manufacturer of batteries.

Now the list of obscure investor names in the dryly worded Press statement we received started to make sense. Here was the first sign of empathy: one of the investors was a manufacturer of electrical goods in Hong Kong. They also make car audio equipment under sub-contract for large Japanese companies, as well as hardware for domestic electrical supplies under the Clipsal brand name. In this they were likened to MK Electric of Britain.

As Director of Corporate Finance at Schroeders Bank in Hong Kong, Paul Banner, the newly installed MD of KEF was a business adviser to GPI when they went public. This is how he became involved in the KEF purchase. "When GPI went public seven years ago their capitalisation was about two hundred million Hong Kong dollars" he told us, "but now that figure has risen to around one and a half billion dollars, due to the efforts of Victor Lo."

"Now GPI want to invest in brand names and move away from sub-contracting. This is part of their strategy to become an international company." We wondered also whether they were prudently diversifying their business prior to the reversion of Hong Kong to Chinese rule when Britain's 'lease' expires in 1997.

"But why buy two British loudspeaker companies instead of just one," I asked, "when both, in brutal commercial terms, were not the world's most successful one might say?"

"We looked around the market and saw many small players. As companies grow to hit £10,000,000 turnover they commonly seem to suffer growth pains and rarely get past this point. KEF first hit problems in 1979 as the market levelled out. Our feeling was that critical size was something around £20,000,000 turnover. Neither of these companies do it separately, but together they do. So to buy one makes no sense but to buy two does make sense."

What are the benefits of size?

"Mainly purchasing power. A bigger company has more power to buy raw materials at good prices."

"How will you harmonise their ranges - if you want to at all?"

"There are no plans to do that, at least whilst the companies are bedding down. We thought the two ranges were complementary in that a lot of things that Celestion do do not compete with KEF. Celestion is strong in the professional market, KEF strong in the car audio market for example."

"But in the UK hi-fi market they do compete directly."

"Well, there's no reason why they shouldn't compete. Competition



## International Rescue

is good for companies; it hones them. This is part of Gold Peak's strategy too."

"Who are the other investors?"

"This is an investment being made by three shareholders: Kinergetic Research, myself and GPI Holdings. Kinergetics research is a Los Angeles based company making high end audio. GPI need other resources, mainly in management, that's why they brought in Kinergetics who they knew from the past."

"Will we be seeing Kinergetics products marketed in the UK through KEF or Celestion?"

"That's not part of the scheme."

We were right: the logic might be plausible, but the structure and approach can aptly be described as peculiar. A combination of initiatives and interests quite removed from UK influence have combined to place two of our best known loudspeaker makers under one roof. Interesting new products, mushrooming from their combined abilities, are likely to be the result ●

# The Sound Organisation London

**HOT  
SUMMER  
SALE**

**A**T LAST, the summer has arrived and so has our sale! We want to clear our shelves for the new season and to encourage you to buy now! We have worked out some great prices. Everything is fully guaranteed and can be demonstrated. Call now to avoid disappointment. ■ ■ ■

## Turntables Arms and Cartridges

**Roksan Xerxes**, walnut, latest spec, XPS2. (£965) £695; **Roksan Xerxes**, walnut, latest spec, 33 only (£695) £495; **Roksan Xerxes**, black ash, complete with Rega arm, s/hand £449; **Rega Planar 3**, colours. Cart extra (£260) £199; **Linn Lingo** turntable power supply (£559) £399; **Linn LVIII Ittok** boxed new (£590) £485; **Linn LVII Ittok** s/hand £295; **Linn Akito** s/hand (£149) £95; **Roksan Tabriz zi** (£270) £239; **Kiseki Purple Heart Sapphire** little used (£799) £649; **Linn Troika** used but in good condition (£798) £499; Very special prices on new **Audio Technica cartridges** eg ATOC5 (£123) £99; ATOC10 (£307) £249; ATOC30 (£510) £419; (No trade in required)

## Compact Disc Players

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

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### Opening Hours

Tuesday - Saturday. 10am to 6am.

### More Sale Stock

We have much more on sale than we can show here, call us for a full list. All sale items are ex-demonstration and in excellent condition.

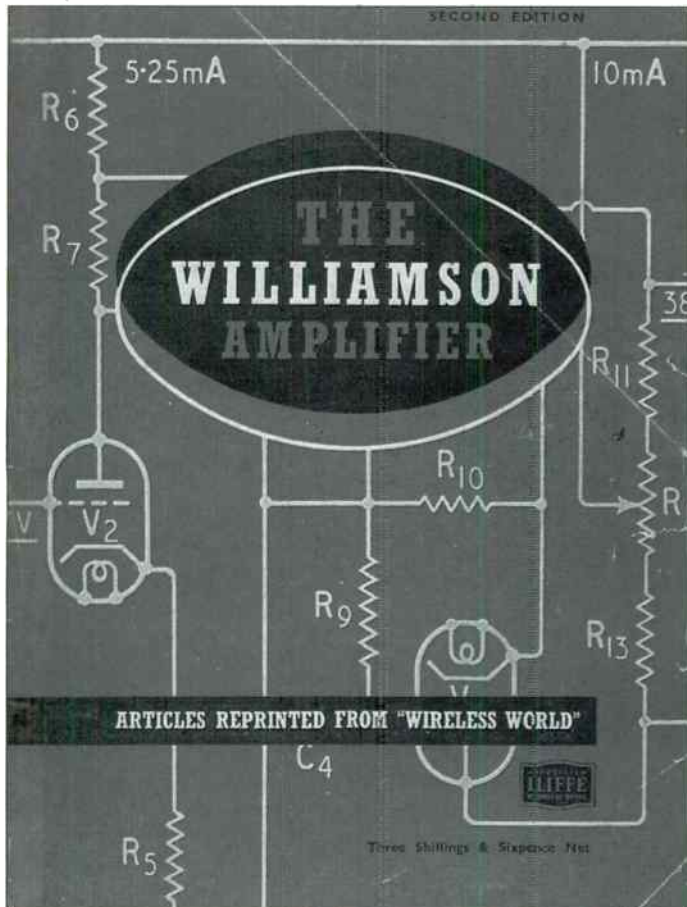
## Amplifiers and Tuners

**Counterpoint SA12** 120 watt hybrid power amp (£1600) £795; **Audio Research Classic 60** hybrid power amplifier (£3699) £2750; **Roksan L1** line stage black finish (£2250) £1995; **Roksan DS1** power supply black finish (£695) £599; **Roksan M1** mono-blocks black finish pair (£4500) £3995; **Exposure 14** professional pre-amplifier (£1499) £995; **Exposure 11** pre-amplifier (£700) £549; **Exposure 12** dual power supply (£650) £499; **Exposure Super 8** stereo power amplifier (£650) £499; **Exposure Mono 8** regulated power amplifiers pair (£1200) £950; **Exposure 15** integrated amplifier mm/mc (£650) £499; **Exposure 20** integrated amplifier line only (£550) £429; **Naim Nat 02** Tuner (£893) £695; **Naim Nac 42** and **Nap 110** s/hand £349; **Naim Nac 42.5** and **Nap 110** s/hand £399; **Naim Nap 90** power amp old style (new) £299; **Audiolab 8000c/p** pre/power amplifiers s/hand (£969) £599; **Rega Elex** amplifier (£330) £249:

## Loudspeakers

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

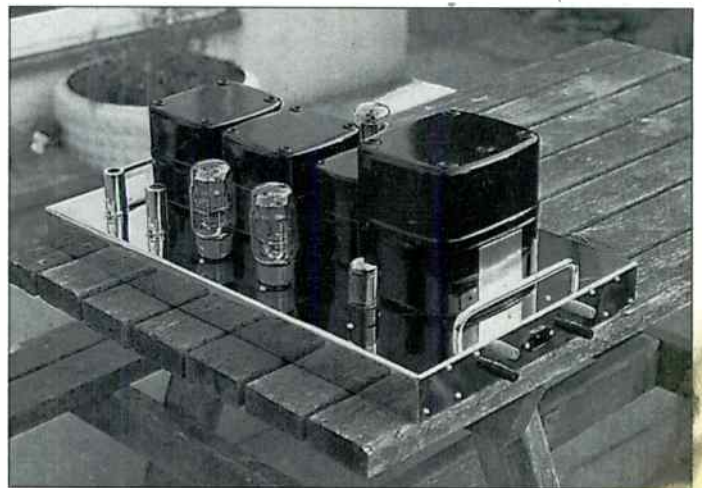
**4** Pickfords Wharf,  
Clink Street,  
London,  
SE1 9DG.  
**071 403 2255**



Williamson designed this amplifier whilst working for the M.O. Valve Company. The circuit was published in *Wireless World* (now *Electronics and Wireless World*) in 1947. In a small book of articles summarising the design and subsequent modifications, the Editor observed that "the Williamson has for several years been widely accepted as the standard of design and performance wherever amplifiers and sound reproduction are discussed. Descriptions of it have been published in all the principle countries of the world."

**A Stereo Williamson power amplifier, single chassis version.**

The original design used triodes operating in push-pull, together with negative feedback to get around 15watts of output. Preferred output valves were a pair of KT66s strapped as triodes. However, a variety of options were suggested, using PX25s, tetrode working and, later, the application of feedback from primary tappings in the



## Obituary

**D.T.N. Williamson precursor of the valve revival and creator of a classic amplifier design.**

**A**lthough now little known, the name D.T.N. Williamson is respected amongst those who were involved in early post-war audio engineering. David Theodore Nelson Williamson designed the internationally renowned 'Williamson' valve amplifier. It was one of the first to achieve 0.1% distortion, "a good level of performance to aim at," he wrote in 1944. "Such a low level of distortion is undetectable by listening tests," wrote Williamson and Peter Walker (Quad) in a fascinating article written for *Wireless World*, September 1952.

It wasn't just the measured performance of the Williamson amplifier that recommended it to people at the time. Writing in a US publication, *Audio Engineering*, November 1949, David Sarser and Melvin Sprinkle said that "recently we heard about the Williamson circuit which has been widely publicized in England and Australia as the absolute tops for obtaining natural reproduction. . . . When this amplifier is connected to a wide range speaker system and fed with good programme material the resulting realism is so startling that it must be heard to be appreciated. . . . this amplifier is the best we have heard yet."

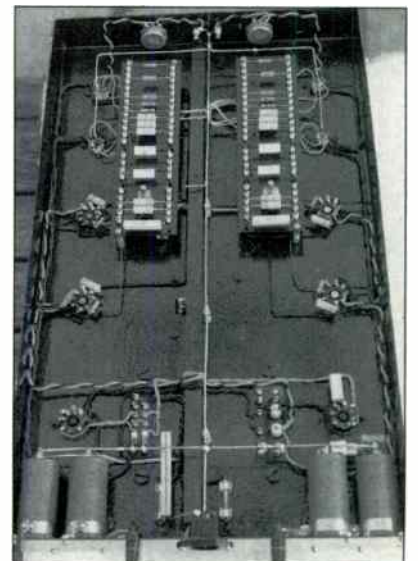
Writing in *Audio Engineering* again, later in 1952, David Hafler and Herbert I Keroes said that "The Williamson circuit . . . is undoubtedly the most popular, high quality audio circuit ever developed. Its listening quality is excellent; it is easy to construct; and it provides top quality at a cost comparable with units that cannot measure up to its capabilities."

output transformer to introduce 'Ultra-linear' working. This suggestion was made by Hafler and Keroes in the States, who claimed that it was a technique pioneered by them in 1951. Peter Walker was quick to reply in *Wireless World* that Quad amplifiers had used Ultra-linear working since 1945, so the Williamson amplifier really stayed British in principle, even though the later version was U.S. inspired.

Williamson's valve amplifier was a classic in its time, yet it was a project he undertook early on in his career, at the end of World War 2. Afterwards, he moved on to military work, followed by a period, spanning the Sixties and Seventies, designing industrial manufacturing equipment. For this work, he was awarded the Fellowship of the Royal Society, together with several honorary doctorates. "Theo was very much the world leader in C.N.C. machine design then, but he also worked with Peter Walker on the design of the original ESL and designed the Ferranti Ribbon pickup," Ross Walker of Quad told us. He retired to Italy, where he died in May 1992 age 69.

**Tidy wiring and layout below the Williamson's chassis.**

**Our thanks to John Howse, of the British Vintage Wireless Society for supplying information and photographs, and to Electronics World (*Wireless World*) for permission to quote copyright material.**



### ★★★ LETTER OF THE MONTH

#### HEARING THREE

I wrote to you a few months ago concerning a cartridge upgrade. I took your advice and bought a Denon DLI 10. However I also got an unexpected boost in cash and also bought a Gyrodec (I even splashed out the extra for the black and gold version) plus power supply, an Audio Innovations Series 200MC and a second-hand Edison 12 valve amp. These drive my DC2000s.

Anyway, I noticed in a reply to a query you said it was unlikely that someone could hear three different turntables in one dealer. I was lucky enough to be able to hear all three in the Music Room, Glasgow, all fitted with identical arms and cartridge.

First was the Pink Triangle. This was a vast improvement on my Syncro, everything sounding natural though slightly small scale sounding, probably just the effect of how neutral it sounded. Then came the Gyrodec, much larger scale, lush with about the same information available. Finally the Roksan. This seemed to be finding slightly more information in the grooves with rock-solid imaging, probably the best in the hi-fi sense.

So why did I pick the Gyrodec? Well, the beautiful construction was something to do with it, but the main reason was only the Gyro could make my goose bumps go crazy when listening to Otis Redding and the Cocteau Twins. It may not have been the most neutral of the three, it may have not been the best hi-fi, but it made the best music.

So thank you to the Music Room for giving me so long (two and a half hours on a Saturday) to make up my mind.

**Kevin Holland,  
Glasgow.**

**My pessimism about the likelihood of hearing all the turntables in one place was obviously misplaced, I'm relieved to hear. As readers will have gathered I think the Gyrodec is one of the unsung heroes of the platter world, so welcome to the club. And I thought, suggesting the Denon, I was keeping the strain on your wallet down! I don't like to mention this, but how about trying a Lyra Lydian or a Morch da Capo next?**

**In the meantime however, see how you get on with the Furukawa FA-1010 cable in your system. EB**

## WIN FURUKAWA FA-2010 BALANCED ANALOGUE INTERCONNECT CABLES (1 metre pairs)

We are offering a little incentive to encourage readers to fill their fountain pens and break open a new notepad. The writer of the most interesting or funniest letter will receive a free set of Furukawa FA-2010 "balanced analogue" interconnect cables, worth £95. These are the cables we have recommended in the past.



#### IMMORTAL JRs

JR 149 loudspeakers about to shuffle off this moving coil? Nonsense. Has Alan Sircom listened to a pair recently? It's a personal opinion, but I feel the 149 from Jim Rogers, founder of Rogers Loudspeakers, has strengths that still have not been beaten, in spite of your reply to Brian Ross in the June 1992 Queries page.

Take the case, built out of heavy gauge aluminium, rolled into a near perfect cylindrical shape. The result: practically no sound coloration. The drive units are the classic KEF B110 bass unit and T27 tweeter. The crossover is located in a separate enclosure at the bottom of the cabinet, out of harm's way. A perforated metal grille covers the drive units at the front, which does mar the sound quality slightly and should be removed.

On the crossover (built on a round printed circuit board) the drive units are connected via

push on tags, so get out the soldering iron and low-lead solder, since these should be made permanent.

Comparing them to better known classics like the LS 3/5A and Quad ESL is quite interesting. The BBC speaker is very similar sounding; it is a little brighter, far less sensitive and a lot more coloured. Against the Quads they sound a little thinner in the mid-range and not quite as open, but offer similar levels of low coloration with much higher SPLs on tap.

Changing the subject - my thanks to Richard Brice for the article on valve power output stages. I am a firm believer in the single ended output mode. I believe it is superior for several reasons. The main reason is the simple driver circuit layout compared to push-pull. A lot of people just do not realise how much effect the driver stage of an amplifier has on the overall sound quality. Most push-pull

amplifiers need at least three valves driving the output stage. With single-ended, one will suffice.

**Haden Boardman,  
Audio Classics, Wigan,  
Lancashire.**

#### KEF SUR-PRIZE

My KEF Q90s, which I won in your recent competition, arrived by courier on Wednesday May 13th, as KEF so kindly arranged.

What a prize! I'm absolutely thrilled! Now that they have begun to settle down (30 hours or so) they are living up to their reputation (by Alan Sircom in Jan '92). And as Mr. S. predicted, they sound pretty good in my system - Philips CD850 Mk 1 and Denon DRM07, the only piece left over from my original budget purchase over three years ago. My amps are the budget pre-power combination by Rotel, RB and RC 960 BX. The Q-90s are already bi-wired and my next step will be bi-amping with another RB960 and more Linn K20 than I care to think about!

These speakers have knocked my listening awareness and appreciation (and soon my bank account) into a new league. Who knows, they may turn out to be a very expensive 'free' win (it was my first win of anything).

Many thanks for all your help in getting them to my door, and keep running the competitions!

**Stephen Force,  
Cheltenham, Glos.**

#### RIP OFF - AGAIN

I have recently been very concerned with the demise of vinyl records that the record industry has forced upon the public. Over the years I have bought numerous records, at what I thought to be extravagant prices, only to find out that now I must replace my whole collection with CDs which are even more expensive. I am now finding it increasingly difficult to find records, but I am determined not to be conned by the record industry.

I believe there is more to come and that the public will face this again with DCC or similar and people will have to replace their CDs with DCC for more extortionate prices.

I think the public are being ripped off and the record industry must be laughing all the way to the bank. If the record industry are so concerned with (perfect) sound why don't they give the public the choice between vinyl and CD, especially when the former is probably

better. I am no killjoy and I like to see progress with CDs; for me I'm keeping my money and sticking with vinyl.

**K. Andrews,  
Lowestoft, Suffolk.**

I can't see why anyone should need to replace your LPs with CDs. I haven't; in fact a neighbour who drops in often to listen to my own system was markedly miffed when she noticed I have duplicated some of my LPs with CDs. (Purely for the purposes of direct comparison of analogue and digital sources.) I prefer spending my money on new releases which are not on vinyl. Beware - a customer of mine in my record retailing days replaced his entire vinyl collection, spending thousands; then regretted it and bought them all back! The format itself might not - in fact will not - be alive or abundant much longer, but the hardware isn't likely to suffer a demise for some time yet. Digital Compact Cassette is probably rather different; for very strong commercial reasons (the markup for retailers will be higher than Compact Cassette) I can visualise pre-recorded DCC tapes replacing cassettes in the shops over the next few years. To draw a parallel, we might end up with a VHS/Betamax situation; people still have Betamax video recorders, blank tapes are still to be found, but pre-recorded videos are now only VHS. I suspect Compact Cassette will end the century as a format only for recording.  
**EB.**

#### MISSING QUAD

I wonder if you would contemplate featuring an article on the theft of hi-fi? I have just had my nineteen year old Quad tuner lifted in curious circumstances.

In March the gas board drilling outside upset my tuner. I took it into Canterbury for repairs and it was sent in to Dover. It returned last month better than ever. This was ironic because two weeks ago someone came over our back fence and hedge, unplugged it and took it (nothing else) away.

I would at least like to draw your readers' attention to the risks endemic in sending a component for repair, since even if the firm is straight, obviously there is opportunity for lapses in security (addresses etc. on tickets).

I am devastated by the theft, as I cannot replace it, even if it were insured. So I am now without music; but the thief is



FREDDY AHMET

## readers' reply

not, he is listening to my tuner. Please, please return my tuner and all is forgiven.

**Distraught,  
Whitstable, Kent.**

We are sorry to hear of your plight. Theft of hi-fi is a very real problem of course, but in your case the thief does appear to have been both discriminating and knowledgeable. The police may well be able to make something of this; we suggest you call them. We also suggest you let people in your area who deal in hi-fi know of the theft. They may well be offered the tuner for sale.

Quad tuners are available second hand and Quad run a repair and refurbishment service that is legendary. You should be able to replace it.  
**NK**

#### THE SINS OF LP

I recently switched from vinyl to CDs. As is widely known, the quality of sound on vinyl LPs deteriorates when playing time exceeds 20-25 minutes per side.

Does this same principle apply to CDs? I have come across a great number of so called "extended play" CDs (usually compilation dance albums) with playing times of up to 80 minutes.

Are such CDs more vulnerable to deterioration, and is sound quality affected to any extent?

Are CD singles more robust than CD albums?

I would be happy for your advice.

**George Nicholas,  
London.**

The LP spins at one speed (engineers describe this as 'constant angular velocity'), so inner grooves move more slowly past the stylus, making mechanical wavelengths imprinted in the groove will get shorter and more difficult to read.

In contrast, the 'groove' on the CD, which is a line of minuscule bumps and pits, moves under the laser beam at constant speed. To achieve this the disc starts off spinning very fast (2000 rpm) and progressively slows down as the laser scans from the inside to the outside. Had this Constant Linear Velocity not been used, then scanning problems would have occurred on inner pits!

Forearmed with knowledge of all the problems inherent in LP scanning, CD was designed to avoid them. As a result, there is absolutely no difference in performance between CDs of different playing times.  
**NK**

#### I'VE BEEN THINKING

I have given thought to the connection between listening room reverb time and mid-band amplitude anomalies, as sound power is a product (strictly speaking a time integral) of both amplitude and duration. This is really the main point of this letter. Various contributors are going on record as saying that such and such a combination of equipment 'sounds better' and are actually imputing absolute merit on this basis. Now to me this seems illogical. If a multi-bit CD player with a realistic approach to real-life music

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transients sets off room reverberations we are told, in all seriousness, that it suffers from a 'glare'. Maybe we shall soon see that the answer lies in room treatment. If an analogue storage medium incurs such drastic compression (whether through its nature or necessarily imposed on the programme fed to it is irrelevant) that it does not engage room colorations, we are seriously expected to believe that it is a better storage medium.

Here, therefore, is a suggestion. In fact I can think of two. First, that analogue lovers will find the insertion of a good quality stereo compressor greatly to their liking. Mainly though, that this magazine print less (allowably well intentioned) twaddle.

**Gerard Frykman,  
Burton-on-Trent, Derby.**

You base your views upon a web of tenuous assumptions. The main one appears to be a conviction that analogue

Continued on page 74...

**T**he people in the record shop were surprised. Despite the intense June sunshine a man had just entered the shop wearing a thick overcoat, hat and sunglasses. Nervously he shuffled over to the racks of CDs and began to pick them up, fiddling with the jewel cases as if for the first time. Other customers looked alarmed as he began muttering about the difficulty of opening the plastic hinged cases, commenting under his breath about the tactile pleasures of handling vinyl records.

Having spent an hour browsing through the stock of compact discs he turned and made his way to the counter, clutching about 15 discs to buy. There staff were bemused to notice that the CDs were mainly old analogue recordings - the AAD type, but that the choice conveyed a keen musical and audiophile taste.

A young lady totalled up his purchase, trying to hide her amusement at the hot and bothered expression facing her from under the wide brim of a dark hat. She took his credit card for payment and put the discs in a bag.

Taking back his card the man thanked her and hurriedly left the shop glancing over his shoulder to make sure no-one had recognised him.

"Who was that, Rosie?" asked the shop owner, "A most extraordinary gent. He looked a bit paranoid, not to say extremely hot... how did he pay? With a credit card? What was his name then?"

When he was told he reeled back in shock, clutching the counter for support. The stranger in the heavy coat was none other than the most committed analogue audiophile he knew, a man who had railed against the inherently poor performance of CD since it was invented. This was one of his best customers for vinyl records, especially the older Deccas, EMIs, and RCAs. This was Peter Qvortrup.

My analogue street credibility is now completely out of the window!

It gets worse. I needed the CDs for comparative listening to the prototypes of the first two Audio Note Digital to Analogue converters; did I detect any shocked whispers?

Does it mean that my record collection will be up for sale?

Absolutely not!

But what it does mean, is that I will be able to offer the great band of you that have settled for Compact Disc, a couple of DACs, which in my opinion are far closer to real life analogue performance criteria than anything else I have heard, and NO it is not as good as my Voyd Reference, AN-1s arm and Audio Note Ioliv cartridge, there is still a yawning gap between the best analogue and anything digital.

This is best exemplified by the commonly accepted fact that CDs made from old analogue master tapes generally sound far better than later digital recordings. Proponents of the digital formats have tried to argue that this is due to the higher quality of the recordings from this period, which in itself is not a very positive argument, as it admits that in one area at least, progress has NOT been made, but their argument is strongly revoked by the fact that most LP versions of digital masters also sound better than their digital counterparts.

The only possible conclusion can be that the less time the signal spends in the digital domain the less degradation it suffers.

Trying to explain this in any other way would be logical fallacy.

With this observation firmly in mind, Guy Adams from Voyd and I have gone about making the most "analogue" digital to analogue converter possible.

Early experiments clearly showed that the multibit technology had considerably greater dynamic potential, better linearity and resolution, when compared to single bit, there is simply less guesswork. I do not believe that it is a coincidence that all the current top-notch converters are 18 or 20 bit, so we are not alone in this observation.

We have settled for the 20-bit Burr-Brown PCM63P chipset with 8-times oversampling, but unlike any of our talented competitors, we have chosen to leave out the semiconductor filtering and incorporate an individually adjusted linear phase filter and use a no feedback Shunt Regulated Push Pull valve output stage. Much work has been extended into power supplies to ensure best possible interaction with both the digital and analogue parts of the circuit.

Offering a digital product has been a philosophically difficult decision for a company which is so deeply committed to absolute sonic performance, above all else.

My belief that convenience and absolute quality in sound reproduction are basically incompatible, remains unshaken. Too often convenience is disguised as sound quality when it is not.

## HAS COUNT DRACULA GONE VEGETARIAN?

What we will be offering by early September will be two converters, the DAC1 and DAC2, to give them a name, where we have focussed on optimising the dynamic range and phase behaviour of the output from the chosen chipset. In order to achieve this we have used interface

technology which I cannot at this time disclose as it is subject to at least two patent applications, copyrights, etc.

The reproduction of CDs using the Audio Note DAC2 is almost completely free from the veil of electronic "noise" that surrounds the start-up and decay of all transients and which gives most music the "glare" and cold hardness that I personally find so objectionable from any music, whether in analogue or digital form.

This cleaning up around transients and the blackness of background, is combined with an hitherto unexperienced dynamic range, which is quite unique. The treble is free from gain, and depending on recording quality, dynamic and clean.

Please note that we have not created a digital "cure-all", many of the ills that still bug the reproduction from Compact Disc will still be present with our converters as they are with others. Problems much earlier in the recording/reproduction chain still need solving, the main one being the low sampling frequency, and the solution certainly is not Data Compression.

When all is said and done I shall still be enjoying my vast record collection, but now, at least, I have a choice between that and a not-so-painful CD reproduction, where the LP is not available.

I only hope that all of you reading this will appreciate that progress is no straight line and that the disrespect many software manufacturers show towards their longstanding LP customers by forcing everybody to write off their investments in analogue reproduction equipment, by making unavailable the software that is played on it, is morally questionable and is depriving the consumer and the market of a choice, which we should all be allowed regardless of the economic politics of hardware manufacturers and software retailers. Choice is a democratic right in a pluralistic capitalist society, I hope the decision makers in the industry's leading companies never let that out of their sights.

Audio Note, as a company is committed to exploring any advances that can be made in either format, and whilst I have my personal preference, that will not deter us from making the best from CD.

The DAC1 is projected to cost £499.00 and the DAC2 £899.00. They should both be available in early September.

Meantime, enjoy your music, whatever format you listen to!

*Peter Qvortrup*

AUDIO NOTE CO. LTD. BRIGHTON  
TEL: 0273 220511 FAX: 0273 731498

**T**ube Technology's £1299 Unisys integrated valve amplifier is one of the UK's best kept secrets - at least, in the UK. Although the products of this company have been seen at a variety of shows and in a handful of dealers, their amplifiers have received scant coverage in Britain.

Much of this is due to their heavy export schedule. The vast majority of Tube Technology products are distributed abroad, with Italy and the Far East taking the lion's share. Only a handful of Unisys amplifiers are destined for English listeners; even our review sample was already sold to Austria.

What a shame that this range of amplifiers have passed the English market by, for the Unisys has to be one of the best built amplifiers around. It is one of a few to come with a ten year guarantee, not the usual one or two year guarantee seen with solid-state products.

The Unisys finally lays the myth of valve amplifier unreliability. It is built like a chromium plated tank. The military parallel is intentional; Tube Technology's metalwork suppliers are none other than Racal Defence. I have been reliably

informed of a Unisys amplifier that was involved in a collision with a fork-lift truck on its way to Spain. Although the case was twisted and buckled and one of the transformers was damaged almost beyond repair, it was still capable of playing. It is a Rolls-Royce of amplifiers; quite literally, in fact, as the final polishing stage is performed by a Rolls Royce sub-contractor. No-one else could maintain such a high standard.

The chrome plating and the thick charcoal-coloured front panel, together with the warm glow of the exposed valves and gold coloured knobs, panels, studs and logo, give the Unisys a distinctive, although slightly gaudy appearance. It will not suit everybody's home, but it does match a number of other expensive products - like the Pierre Lume turntable, for example. For those who cannot have exposed valves

on display, there is a separate cover, for £48.

The amplifier chassis is solid and more than capable of protecting the components inside. Many valve amplifier manufacturers still use hardwiring, claiming that circuit boards have an adverse affect upon sound quality. However, most of the world's best amplifiers use circuit boards, albeit high quality ones. The boards of the Unisys make for easier and cheaper servicing, as they can be removed and replaced quickly.

Internally, the Unisys is split into a separate preamplifier and power amplifier. As in the Audionote Oto, only the mains cable is common to both sections, which explains the black circular growth on the rear: it's the preamplifier's main transformer. The preamplifier section is virtually hidden from view, but grilles in front and on the side panel underneath the right hand output transformer show the glint of the ECC88 valves that sit horizontally on the preamplifier board hidden within the chassis.

This valve amplifier offers little to the gadget junkie. At the right of the front panel the selector knob offers a choice of Compact Disc, line level Auxiliary, ▶▶



# A SENSE OF RHYTHM

As defined by Tube Technology's Unisys integrated valve amplifier and Alan Sircom.

Moving Magnet phono, tape or tuner. There is no tape monitor. All of these inputs have corresponding gold plated phono sockets on the rear panel. The centre knob is the volume control and the left hand one is the on/off switch, with an accompanying red display LED to its right. The controls have a beautifully chunky action to them; Tube Technology have taken an almost obsessive interest in every small feature, including its 'feel'. Car manufacturers have suddenly discovered that humans make judgements based on almost

of the Audio Innovations/Audionote clan, the Unisys adopts small amounts of localised feedback in the circuit. While this appears to remove some of the lightness and openness possible with no-feedback designs, the Unisys fills this gap with a rhythmic drive that is harder to achieve with the alternative arrangement.

The manual supplied is excellent. Not only are the line drawings and explanations simple to follow and concise, but the entire package bolsters pride of ownership. It also presents some of the Tube Technology philosophy, an encouragement to owners to upgrade to the Prophet preamplifier and Genesis monoblock power amplifiers! So often, good products are let down by an instruction manual that consists only of a photocopied sheet. Such attention to detail is to be commended.

### Electronic Smell

Discussed in the manual is the task of burning in. In the first few days of the amplifier's life, the Unisys exudes what the manufacturer describes as 'an Electronic Smell' (is this a shocking smell?). Perhaps this needs no explanation to those who have bought and used new valve products, but owners new to tubes could find it disconcerting. The manual helps to dispel fears of like-y combustion.

Once burnt in, the Unisys still needs some warm up each time it is used. As a rule of thumb, a good half an hour is necessary before it really begins to come into its own. Before this, the amplifier sounds restrained and undynamic. I found that by the time the volume control was warm to the touch, the Unisys was ready to roll.

Sonically, the amplifier has many of the positive aspects of both valve and solid state amplifiers. It has a sense of rhythm and the ability to hold onto the bass driver in a way usually reserved for Naim amplifiers and the like. On 'Remedy' by The Black Crowes, this comes across as complete control of the drumkit; most valve amplifiers will

soften these low notes, slurring them into one another to a small degree.

Bass guitars, drums and rhythm sections were easy to follow, and the grip seemed to add a few more notes to the bass performance of the ProAc Response One S loudspeakers I used. This grip and solidity is traded against some of the air and lightness attributed to valve amplifiers today.

Given the low end grip of the Unisys it is only natural that it sounded stable and confident. The Black Crowes' drummer and his drum kit stayed in the centre stage, never once wavering or drifting as a whole image.

Overall, images were very well established, with superb centre stage realism. On the Athena Alexander Nevsky recording, the orchestral layering was as good as could be expected from the ProAcs. Although the stage width was not as expansive as I have heard, the soundstage was deep and natural, neither over large nor too broad. On the Stone Roses 'Fools Gold' EP, it was almost possible to see the recording engineer playing with the faders in some of the more trippy/funky parts of the mix.

This EP showed up several characteristics, unique to the Unisys in the valve world. The Unisys is packed with plenty of boogie, like a Naim. 'Fools Gold', often considered to be the Stone Roses' finest 9 minutes and 53 seconds to date, has a very fast, tight percussion in both bass and treble, with the bass grumbling away in the foreground. Most valve amplifiers present the bass about half a beat behind the treble. The Unisys played both with spot-on timing accuracy.

It was not as adept at separating the vocal from the remainder of the recording, although Ian Brown's voice is recessed far into the mix. Enunciation was not as clear as I have heard; you have to strain a little harder to follow the vocals.

Somewhere down the line, I felt that the sound quality was more suitable for rock programme. Although classical and

## Most valve amplifiers present the bass about half a beat behind the treble. The Unisys played both with spot-on timing accuracy.

subliminal cognitive assessment: the firm 'clunk' of a door suggests good build quality; a silent ride unaccompanied by buzzes, thrums and rattles makes the same appeal. So it is with this amplifier: its massive build quality, superb finish and firm control actions all make a clear statement of quality to observers.

An internal interconnect cable from Furukawa joins the preamplifier to the power amplifier stage. Here the valves are more self-confident, being on display for all to see. They consist of a single 12AT7 double triode, partnered with four EL84 output valves per channel. Although the review sample was supplied with matched National valves (from the USA), it is possible to re-bias each valve individually; instructions are given in the manual. The quartet of EL84s each side give the Unisys a thirty watt per channel output, with an eight ohm loudspeaker load.

Finally, unlike the no-feedback ethic

### MEASURED PERFORMANCE

The potential problems of making an integrated valve amplifier this size are great enough to dissuade most designers from attempting to do so. Hum induction is the biggest problem. Keeping a sensitive disc stage hum-free with a giant mains transformer and AC heaters close by is an all but impossible task usually avoided by using separate pre and power amplifiers.

Engineers might be thinking uncharitably that with a miniature IC like the popular NE5532 inside, hard up against the input sockets, plus a bit of screening, there's no problem. Well, that's what passed through my mind for a brief instant - 'till I looked underneath. I was not surprised, but amazed to see an all-valve disc stage, the valves being shoehorned into the chassis by laying them horizontally, with their sockets on small circuit boards. Screened cooling vents have been stamped into the chassis top and side to get cooling air to pass through by convection.

The disc stage has very little hum, not enough to be audible. Hiss was minimal too, considering the very high sensitivity of 1.6mV provided. The disc stage has very low equivalent input noise (the only true measure of hiss, because it takes gain into account) - lower than that of most transistor amps.

Frequency response via disc was wide within 1dB limits, but treble equalisation allows high frequency output to rise steadily, which will give LP a bright sheen to its sound. Warp filtering has been built in (an IEC recommendation), limiting low frequency response to 36Hz, a normal value these days. With good overload headroom and low input capacitance (47k/150pF), the phono stage has been very well engineered, especially considering the lack of space and close proximity of the mains tranny.

But do valve amps work well enough to complement CD? There's no inherent problem here with valve technology, although channel separation was on the low side at 58dB. However, we have limited natural

separation in our hearing that makes any figure greater than about 25dB acceptable for full stereo stage width to be perceived, so this result is not a problem. High sensitivity of 170mV allows all partnering equipment to match, including low-output tuners and cassette decks. Hiss was low at -90dB.

The distortion behaviour of this design suggests to me that some effort has been put into designing for low distortion, using feedback and, possibly, ultra-linear working. From experience I would expect this to give the Unisys a different sound to low-feedback valve amps of the Audio Innovations type for example. Cleanliness and control are usually gained, at the expense of easily delivered dynamic contrasts and a certain fluidity of presentation. The Unisys produced less than 0.1% distortion right across the audio band at normal music levels. The figure only rose at high frequencies when power was demanded (i.e. close to full output).

The distortion analysis shows that third harmonic dominated at 10kHz and this re-



jazz music performances were handled well, I tended to lean toward the Rock part of my collection. On the whole, however, this matches my own tastes in music, so I am unsure whether this biasing was due to my listening to Rock music more through the Unisys, or that it sounds a little hard for Classical music. My gut reaction, as I reach for the Free album one more time, is that the Unisys is so enjoyable, that acting in 'review mode' is rapidly forgotten.

In comparison to the finest, there was also a lessening of mid-band transparency. This was more a difference in priorities between my own listening criteria and those of the designer, rather than anything more serious. The Unisys trades mid-band clarity for a richness and vivacity in music: like an Arcam Alpha CD over Rotel, or a Lyra cartridge over a Dynavector.

### Album Hopping

The sound is one I would describe as being very listenable. Sessions lengthened as yet another LP or CD was played. The usual track-hopping that I associate with reviewing rapidly became album hopping. Whilst warmer sounding than most solid state amplifiers, the Unisys character was a touch forward and bright compared to most valve amplifiers. Often came over as detailed and insightful, but it was a character that would not find especial favour with lovers of the conventional soft, mel sound attributed to valve performance.

In hi-fi, the words 'forward' and 'bright' can have both positive and negative aspects. In the Unisys, such words are definitely positive, as they allow the listener into the music. It was easy to follow the subtle interplay between two trumpets on Duke Ellington's 'Unknown Sessions' - an interplay that usually passes unnoticed. Such factors act to make music that more enjoyable.

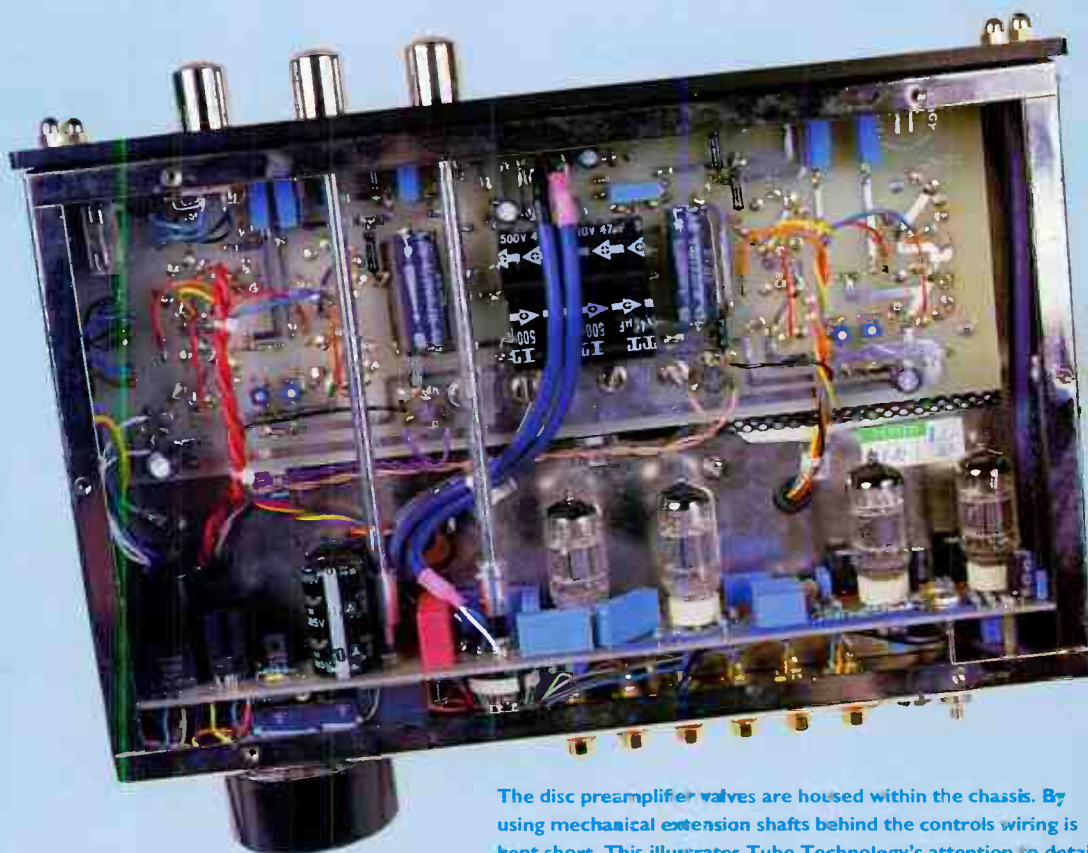
Added to this forward nature is the

sheer speed and tautness of the sound. The Unisys might not be the most neutral amplifier around, but any colourations are aimed at musical enjoyment and do not appear based on any lack of understanding of amplifier design. It produces a sound that injects life and richness into any recording.

Comparing it to the other valve integrated amplifiers at and around the price is interesting. I have had first-hand experience of all of them over the past year and I feel that the Unisys is in the top league. It is as well made as the Copland CTA-401, but its sound will attract those who would find the Copland too 'polite'. It is nearly as dynamic, but more powerful, rhythmically adept and has a more authoritative sound than the Audionote Oto, yet

The Unisys is less powerful, but more sophisticated sounding than the Michaelson integrated - and it has a phono stage. Finally, the Audio Innovations Series 500 does not have the speed and attack of the Unisys, yet the 500 has a silken quality that it lacks.

This is fast becoming a densely populated market, but one that offers a healthy variety of different sounds. Tube Technology's Unisys fits a definite gap for those who want a fast, pacy amplifier, but wish for some smoothness with their speed. It has that rare ability to push back bedtime: music gets played and played until the wee small hours. If you cut your teeth on something like the Naim Nait, but have been seduced by the glowing valve, then the Unisys is the perfect answer ●



The disc preamplifier valves are housed within the chassis. By using mechanical extension shafts behind the controls wiring is kept short. This illustrates Tube Technology's attention to detail.

remained the case at lower frequencies too. Valve amps are thought of as producing mostly second harmonic, but this is not necessarily the case. Many low distortion, sophisticated, multiple feedback designs I have come across in the past produce more third than second and they usually have a different sound, often felt to be more akin to a solid state sound.

This is an observation rather than an implied criticism. Valve amplifiers can differ quite markedly in their sound; not all display those properties, commonly described as warmth and smoothness, usually associated with the breed. Much depends upon the intricacies of the design in question.

Power output measured 28watts into eight ohms. Although healthy by valve standards and very good for an integrated stereo unit with everything on one chassis, it is still on the low side for modern, inefficient loudspeakers if much volume is needed. Normal (rather than loud) listening levels are required, unless a buyer's budget (and

home) stretches to Tannoy Westminster.

From top to bottom this is a remarkably well engineered valve amplifier. Appearance doesn't substitute for performance. I am

only surprised that more isn't known about the Unisys in the home market. But then whilst Britain seems to consume mid-systems from the East, the East buys valve amplifiers like this one from Britain. **NK**

### Distortion



Third harmonic distortion predominates at high frequencies, shown here (10kHz). The same performance exists in the mid-band.

### Test Results

Power	28watts
<b>CD/tuner/aux.</b>	
Frequency response	12Hz-170kHz
Separation	58dB
Noise	-90dB
Distortion	0.08%
Sensitivity	170mV
dc offset	none
<b>Disc</b>	
Frequency response	36Hz-30kHz
Separation	56dB
Noise	-70dB
Distortion	0.08%
Sensitivity	1.6mV
Overload	90mV

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No one quite knows or seems to want to predict what might happen to domestic hi-fi over the next few years. Will we all end up using Digital Compact Cassettes, or miniature recordable Compact Discs? Will CD die, or DCC or MD or cassette? And will the ordinary man in the street who wants a hi-fi, plain and simple, get confused or even annoyed about what is going on? I wonder whether the buying public will have the last laugh on this episode.

Sony did a good job in underlining the strengths of MiniDisc at their recent European press conference in Salzburg that I attended. They successfully changed people's (well, the press!) attitudes toward it I believe, including mine. Mind you, their reticence in publicising the system up to now has let Philips run away with the marketing initiative for their rival format - Digital Compact Cassette (DCC). At Hi-Fi World we have been regularly updated by visits, press conferences, technical information and what have you about DCC, but have heard little about MD. This reticence has resulted in speculation about MD's future in many publications; The Sunday Times recently said that Philips were winning the war with DCC for example, which brought a Mandy Rice Davis observation from one frustrated Sony person: "Well they would, wouldn't they!"

Sadly, there seems to be a gap between how the Press and industry view this format war and how so many potential buyers might see it. When people buy a CD player for example, do they buy a technological toy for its own sake, or do they buy a means to play and enjoy music? The industry is convinced the former is true; music barely gets a mention by anyone on a press trip like Sony's. A new toy stimulates the market, Philips marketing men have told us, putting hi-fi back up the list of people's buying priorities. This has certainly been true of CD, but it hasn't been true of DAT; the shops haven't been exactly besieged with eager buyers.

But if people buy a means to play music, then the outcome of this forthcoming war might be different. The DAT scenario acts as a warning to those who think one or all of the new formats will be automatically accepted. I am reminded by the letters we receive from readers complaining bitterly about being denied the right to continue building

their LP collections that the public can see this thing differently. And why not? If people buy LP, or CD or Cassette primarily to listen to music, which seems reasonable enough, then the sudden proliferation of formats and the likelihood of being stuck with one that goes down the chute in a few years' time might cause so much uncertainty that neither DCC nor MD gets the sort of reception expected and possibly required for its survival.

I think it is a pity that both audio journalists and those in the Consumer Electronics industry seem uncaring about the damage sudden format changes may inflict upon the buying public's confidence. However, we have to look at a new force in these affairs - the music business and the retail trade. I can't recall their successful intervention in the past, but everyone knows how effectively they have helped to kill off LP sales recently to promote CD. Are they likely to act in the same manner again?

The answer is likely to be "yes". Now faced with five formats to manufacture and stock (LP, CD, cassette, MD and DCC), expect some action for this quarter! The hi-fi format we end up with may well be decided by decisive action from the music business or the retail trade.

Or it could just be that people will get so confused and fed up that they'll go out and spend their money on something else - like a new pair of trainers or a better TV. Then it'll be the buying public that have the last laugh in this episode - and quite right too!

Where did the hobbyist go? No one quite knows. Automated manufacture, justified by a global market, has brought hardware prices down dramatically over the years, removing the need to build. That's one reason why DIY has wilted. It's difficult to run in the magazines as well, which has helped it to fall from view.

We want to reintroduce DIY features. Building something is entertaining, creative and instructional. With loudspeakers it won't save much money, except with the bigger designs, but it

does give people with a practical bent a chance to learn how something works, to experiment with its design and to influence the final sound. Most of Britain's specialist hi-fi manufacturers were started by people who had a natural interest in designing and building a product that gave them what they thought was a better sounding product. UK Hi-Fi Inc. was largely built by hobbyists that went professional. We need more of it.



## Reflections from Noel Keywood

# kaleidoscope

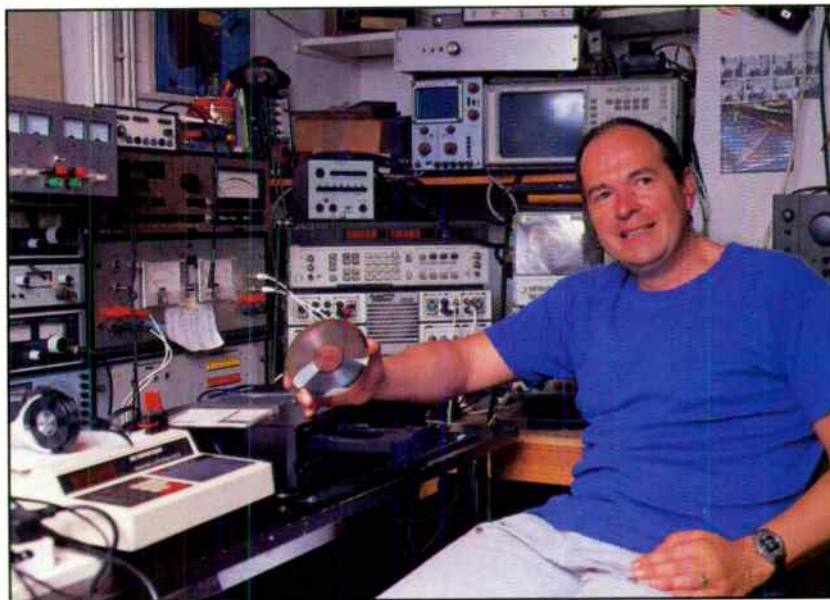
As hi-fi products get steadily more complex, reviewing them demands ever more knowledge and, for measurement, test equipment. Even though testing has its detractors, and I have to admit that it does tend to bring a whole raft of impenetrable jargon and tech-talk with it that baffles readers and leaves them none the wiser, it is necessary all the same. The issue is to make sure that reviews backed up by complex measurements are not turned into research papers!

This isn't an impossible task. On the basis that you set a thief to catch a thief, you get a reviewer to interpret a reviewer. I'm pleased to say that we've

now got Martin Colloms reviewing for Hi-Fi World. It took me a long time to interpret his first article for us - which is why he is laughing in the picture - but I managed it in the end. I trust you won't be baffled by his conclusions on the CVT 3030 amplifier tested in this issue.

Martin joins Paul Miller in being mega-technical, equipped with heavyweight measuring power - and reviewing for Hi-Fi World. It enables us to give you really comprehensive and knowledgeable reviews, not superficial appraisals based solely upon opinion or prejudice.

Martin Colloms ▼



# POWER TO THE PEOPLE

Six pre-power combinations for every purse from £350 to over £1000.

Report by Alan Sircom. Measurement by Noel Keywood.

The pre/power amplifier has always been firmly the domain of the specialist hi-fi enthusiast. Generally associated with spending large sums of money, pre/powers were considered to be the best way of getting the most out of an expensive turntable, especially with a high quality moving coil cartridge.

Times have changed. The LP is in decline, while the Compact Disc player now dominates the new breed of hi-fi buyers. This in itself has given rise to a new form: the budget pre/power amplifier, like the Rotel pair reviewed here.

What is the point of a pre/power amplifier in this digital age? It facilitates an easy and logical upgrade path - beef up the sound, by beefing up the power amplifier. Make thirty watts into three hundred without recourse to soldering. Also, by separating the rather delicate preamplifier stage from the large transformers in the power amplifier, the preamplifier tends to be more capable of disclosing sensitive fine details. In the case of moving coil cartridge



MUSICAL FIDELITY RAINBOWITY PRE/POWER £917.00



ARCAM DELTA 110/120 £1039.00



MOTH SERIES 30 £508.00



CRIMSON ELEKTRIK £1150.00

inputs, one can readily hear the hum of the power transformers if the pre and power are too close. The same is true, to a lesser extent, of all the preamplifier's inputs.

A pre/power combination gives the amplifier designer the ability to make a more dedicated product than the run-of-the-mill integrated amplifier. In our cross-section of pre/powers reviewed here, we see standard two box devices, three box devices, mono amps, stereo amps and bridged stereo amps. Each one of these represents the designer's statement, his or her view on which method of amplification is best, given the constraints of price.

We decided to look at a variety of combinations, from just under £350 to a little over the £1100 mark. Listing the amplifiers alphabetically, we have the front-ended Albarry AP4 preamplifier, at £349.95 with matching S508 power amplifier at £499.95. Next comes the popular Arcam Delta 110 pre/120 power amplifier at £519.90 a piece. The 110 preamplifier can be supplied with or without a Bitstream converter: ours came without, but it can be purchased in this form complete for £719.90.

Moving down the alphabet, Crimson Elektrik have re-appeared on the hi-fi scene after a long break and we look at their 610 preamplifier with BPS power supply and monoblock 630 power amplifiers, totalling £1150. Next come the Moth Series 30 amplifiers, with their light ash front. The basic configuration tested here comes to £508, but is readily expandable - just add money.

Next in line is the Musical Fidelity Rainbow preamplifier, priced £299, based on The Preamp, tested recently, but is supplied with a MM/MC phono stage and costs £100 more. This is combined with two bridged Typhoon power amplifiers, which also cost £299 each. Finally, Rotel's budget RC-960BX pre and RB-960BX power amplifier are by far the cheapest of the group at £499.95 for the pair.

For the purposes of the test, I used a Pink Triangle Anniversary turntable with an SME V arm and Denon CH-304

cartridge as moving coil cartridge source. If an MC stage can cope with the very low output of the Denon, then it can cope with anything, bar the output of the expensive Ortofon and Audionote designs. This Denon cartridge was combined with an Audio Innovations Series 1000 MC transformer to act as a moving magnet cartridge. Digital source was a Pioneer PD-9700.

Reference amplification used for comparison was an old Pink Triangle PIP II preamplifier with a John Shearne Phase One power amplifier. Loudspeakers used were ProAc Response One 'S' on their own supremely heavy stands. Furukawa cable was used throughout. Each amplifier was given time to burn in before listening tests were performed and all were supported on tables from The Sound Organisation, with a Mana Acoustics table for the turntable.

Finally, my normal choice of reference power amplifier and loudspeakers, the Adcom 585 and DynAudio Contour 1.8, were not used for the purposes of this test. It was felt that the comparatively low impedance of the DynAudio Contour 1.8 would pose too difficult a load for a small amplifier and comparison with a 250watt US amplifier would also prove a little unfair. Where it was deemed necessary and relevant, however, the Adcom and/or the DynAudios were pressed into service and the results of such side issues are noted.

**RECORDINGS USED:**

- On LP  
**DEAD CAN DANCE**  
The Serpents Egg (4AD)  
**RIGHT SAID FRED**  
Up (TUG RECORDS)  
**JAMES**  
Seven (FONTANA)  
**ART BLAKEY AND THE JAZZ MESSENGERS**  
Live at The Jazz Corner Of The World, Vol 2. (JAPANESE BLUE NOTE)  
**GILBERT & SULLIVAN**  
Pirates of Penzance (DECCA SKL SERIES - LONG SINCE DELETED)

- On CD  
**GARY MOORE**  
After Hours (VIRGIN)  
**PIXIES**  
Trompe Le Monde (4AD)  
**GOD**  
Possession (VIRGIN VENTURE)  
**BIBER**  
The Mystery Sonatas (VIRGIN CLASSICS)



ROTEL RC960BX £349.95



ALBARRY AP4/S508 £349.95

PHOTO: JOHN BRUCE. TEL: 071 625 1456

HI-FI WORLD AUGUST 1992



## Albarry AP4/S508

£849.90

The Albarry pre/power combination represents the next step up from their PPI integrated amplifier. The £349.95 AP4 preamplifier has many characteristics in common with the PPI; the £499.95 S508 power amplifier is basically a scaled down version of their monoblock M408 and M1008 power amplifiers.

Both have a touch of the minimalisms about them. The preamplifier has but four rotary controls: an on/off switch, volume, tape monitor and source selector, for phono, CD, tuner, Auxiliary line input and an A.V. input for a video recorder or similar.

The tape monitor button has an interesting extra. When switched to Source, the AP4 is said to be operate in purely passive mode, while a third '+16dB' position, which has to be used for moving coil cartridges, is said to run the preamplifier in active mode. Such an option is rare; I have only encountered it on the Pip II used in this test. Although the AP4 has a phono stage that can be set for either moving coil or moving magnet cartridges, this would usually be set by the factory or dealer; ours was set up for MC.

Identical in size to the AP4, at 440mm wide, 78mm high and 265mm deep, with the same semi-opaque deep red acrylic front panel, the S508 is far heavier. As with the AP4, there is an on/off switch at the left and a small red LED to its right. In addition there are two further LEDs to denote left and right channel overload.

### SOUND QUALITY

Albarry amplifiers and ProAc loudspeakers are well known in the industry as a good match, but I did not predict such a magical synergy as there was between the Albarry power amplifier and the Response One S. The S508 has much of the slam and impact associated with big power amplifiers and the grace and smoothness of a good valve power amplifier.

On the Dead Can Dance track, it produced rapid, powerful, deep bass notes, far better controlled than any of the other amplifiers in this test. Although the power

amplifier is slightly soft at the top end, it never sounds rolled off or muted in the treble. The mid-range has a wonderful, very satisfying quality.

Stereo imagery is excellent. This, combined with a superbly coherent overall sound regardless of musical programme, made the Albarry power amplifier by far the finest in the test.

The preamplifier lets the side down, unfortunately. It performs best when left powered constantly. While it is tonally even and more than competent, it is no match for the power amplifier. Solo, it is harder to

recommend without reservation than its partner.

What it lacks is that last degree of finesse and detail that sets the S508 apart from the rest. Compared to the Pip, the AP4's tonal balance is pretty much its equal, yet it loses much of the subtle detail that adds magic to a good system. The two combined fare rather better with, overall, a refined and warm sound, yet without the absolute solidity of image possible with the same power amplifier in other systems.

Where the two fail to succeed together is with music containing a great deal of ambient information, as in Decca's Pirates of Penzance or the Virgin Classic Biber recording. The system retains much of the light, airy and subtle sound of the two individual products, yet it becomes too laid-back and soft with the preamplifier in place.

Finally, the AP4/S508 combination never quite grips the loudspeakers in the same way that the S508 is clearly capable of. Somewhere along the way, the AP4 softens the signal. Going back to the Dead Can Dance track, the bass seemed to stay in first gear throughout the recording.

### CONCLUSION

It's clear that Albarry's forte is in power amplifier production. The S508, partnered with a good preamplifier, has all the makings of a budget high-end classic in its sweetness and warmth. The preamplifier is not in the same class. Though combining the two gives a good sound overall, the AP4 fails to grasp the potential of the excellent power amplifier.

### MEASURED PERFORMANCE

The Albarry power amplifier produces a modest 45 watts into eight ohms, but it copes with low loads well, increasing output healthily to 80 watts into four ohms. It will go loud-ish with normal speakers, but in spite of its bulk this unit is no powerhouse designed for headbangers.

Distortion rose little at high frequencies, which is always a good sign. In fact, overall distortion levels were low at around 0.02%. Even with the power amp running near flat out, the increase in distortion was small. I would expect reasonably clean treble and a fairly relaxed delivery at high volume, due to these traits.

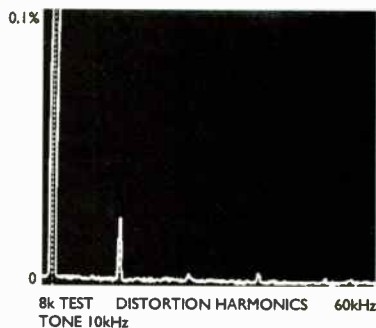
Problems arose with the AP4 preamplifier, when used in conjunction with the power amp. It has a peculiar, and unnecessary +16dB gain option that tests showed had to be used with phono to get enough sensitivity, plus flat frequency response for a moving coil cartridge, but shouldn't be used with CD, tuner or any other of the flat inputs, due to input overload occurring early at 1.5V. It resulted in optional input sensitivities of 70mV/500mV for the 'flat' inputs, the former being too high, but the latter too low for some cassette decks (e.g. Pioneers) with 300mV maximum output.

The preamp comes set for moving coil cartridges, but can be dealer-modified for moving magnet types. Hiss (equivalent input noise) was very low and sensitivity high at 0.2mV for full output.

The Albarry power amplifier measured well, but the preamplifier +16dB option struck me as confusing and unnecessary. NK

Power	45watts
CD/tuner/aux.	
Frequency response	6Hz-160kHz
Separation	86dB
Noise	-110dB
Distortion	0.02%
Sensitivity	500mV
dc offset	+4/-5mV
Disc	
Frequency response	38Hz-34kHz
Separation	47dB
Noise	-72dB
Distortion	0.02%
Sensitivity	0.2mV
Overload	4mV

### DISTORTION



A little second harmonic distortion

**F**lexibility is the name of Arcam's game with the Delta 110/120 combination. Both the pre and power amplifiers are laden with controls. Full remote control which includes volume, is standard. There is also an on-board digital-to-analogue convertor option, for £200 more.

Even without it, however, the Delta 110 is specified to the hilt. There are no tone controls, but there is provision for turntable, AV (for video recorders), tuner and two tape machines. There is a muting button, record monitor, mono switch, balance control, volume knob and headphone socket. A display LED sits above each of the input switches.

At the rear of the amplifier, along with the phono sockets for other sources, there are two pairs of gold phono outputs and a moving magnet/moving coil selector button. A range of specific input cards is available for 'difficult' cartridge loads.

For a power amplifier, the Delta 120 is equally well specified. On the front panel are an on/off switch and buttons for selecting between two pairs of loudspeakers. Speaker outputs are meaty terminals at the centre of the rear panel, between the protruding heatsinks. Bridging and/or mono operation is possible, selected by means of two small blue buttons also at the rear. Finally there are two sets of terminals for AC or DC coupling.



## Arcam Delta 110/120

£1039.80

Arcam felt that the amplifiers should be partnered with their own interconnect. Two lengths of AudioQuest Quartz were supplied and were used instead of the normal Furukawa.

### SOUND QUALITY

The Arcam pre/power amplifier took on the form of the friendly giant of the piece. The

power amplifier had the ability to scare even the hardest of hi-fi loudspeakers into submission, yet never once caused panic in the ProAcs. This was the only amplifier that had enough power to drive the Dynaudio Contour 1.8s without losing the fight.

Compared to the Musical Fidelity or the Crimson Elektrik, the Arcam sounded flat and undynamic, never allowing itself to get carried away with the music. As with the Albany's, I feel that the preamplifier is largely to blame. Where the Arcam will score highly is among people with very bright, expressive loudspeakers, or those who describe most hi-fi as 'fierce' or 'too intense'. The Arcam combination is better suited toward those who like what has become known as the 'classic' British sound. Such systems often sound lacking in punch compared to the exciting and excitable sound of the 'flat earth' school.

These amps produce a warm, bloomy sound that, although detailed, can over-refine some music. It sounded fine with classical programme, but James lacked the drive that is making them so popular. The Arcam smoothed over cracks that were a part of the music. Taken individually, both pre and power amplifier have broadly similar characters; they instil a little of that Arcam warmth and bloom in whatever system they are inserted.

The preamplifier is the weaker of the two, but only just. In the reference system, it lost dynamic range and focus, while, by contrast, the power amplifier was far more adept at being simply a power amplifier, adding only a little roundness to the bass. Taken in context, the system is difficult to beat. It may not be the most dynamic or exciting in the world, but it has a 'fit and forget' factor that gives great peace of mind.

### CONCLUSION

Built to last, the Arcam Delta 110/120 system is a powerful and very safe bet, producing a warm and enveloping sound. Both pre and power are equally versatile and the two can be recommended as good all-purpose amplification.

### MEASURED PERFORMANCE

The Delta 120 is a powerhouse: it produces 110 watts in normal stereo mode, but if this isn't enough 156 watts is available for low impedance loudspeakers and around 350 watts (Arcam say) for normal eight ohm loudspeakers in bridged mode. Two power amps are needed for stereo when bridged, so you don't get something for nothing. We used just one Delta 120, unbridged.

Arcam use dual mono construction with twin toroidal power transformers, so one channel doesn't affect the other. There are two sets of speaker outputs, with switch selection between them. The inputs can be mono'd for bi-amping, but again to use this option means buying another power amp.

The Delta 110 preamplifier can have a Bitstream digital convertor fitted as an option; ours did not. Frequency response was wide at 6Hz-34kHz, input sensitivity proved usefully high for all partnering items and hiss negligible. Remote control demands active switching, which imposes an input overload ceiling of 3.2V. Luckily, this is enough to accept CD (2V maximum output) without overload.

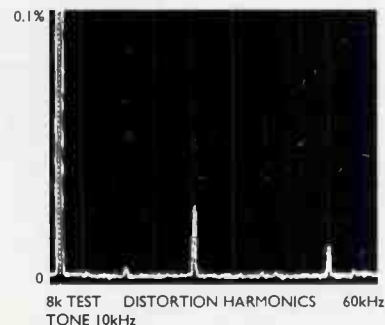
Disc has moving magnet and moving coil options, switch-selected on the rear panel. Noise was low and all input conditions satisfactory. Warp filtering is used, limiting low frequency response to 30Hz. MC was very sensitive and quiet enough for high quality, low output designs to be used.

Distortion via all inputs measured a low 0.03% maximum, odd order harmonics dominating. Levels were highest at low outputs, indicative of Class B working, an unusual characteristic these days, especially from conventional Arcam.

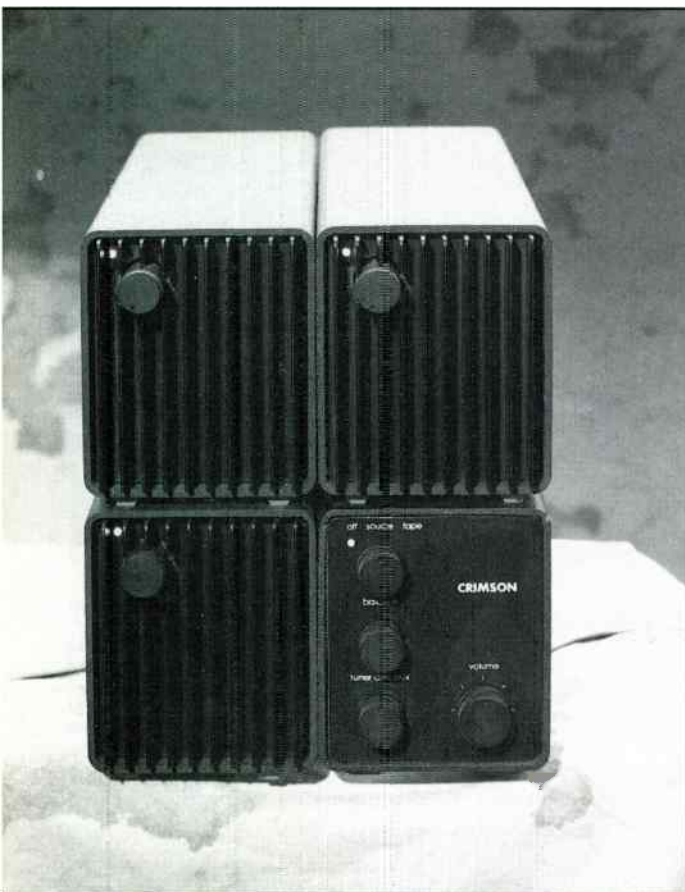
The Arcam amps measured very well in all areas, as expected. I would expect a competent subjective performance, but CMOS input switching may impose some subtle limitations. **NK**

Power	112watts
CD/tuner/aux.	
Frequency response	6Hz-34kHz
Separation	67dB
Noise	-102dB
Distortion	0.03%
Sensitivity	180mV
dc offset	7/4mV
Disc (MM)	
Frequency response	30Hz-33kHz
Separation	67dB
Noise	-81dB
Distortion	0.03%
Sensitivity	4mV
Overload	70mV
Disc (MC)	
Frequency response	28Hz-33kHz
Separation	65dB
Noise	-71dB
Distortion	0.03%
Sensitivity	0.22mV
Overload	3.5mV

### DISTORTION



A little third and fifth harmonic distortion



## Crimson Elektrik

£1150.00

Crimson Elektrik's unique, if small, hi-fi range has been quietly, but consistently, selling in Europe, but has vanished from UK dealers' shelves. The time is now ripe for Crimson to return to the homeland.

We decided to review Crimson's top models, the £400 610 preamplifier, the eighty watt 630 mono power amplifiers at £290 each and the £170 BPS power supply for the 610. At £1150, it compares very favourably with traditional rivals from Linn and Naim.

Styling is not the Crimson's best feature. It is kindest to say that it is 'functional': in the same way that a tank is - hard, brutal, inelegant. The sophistication and ergonomics of the controls could best be described as 'early Skoda'. Internally, however, things are different. The latest products use an Alps volume pot, PTFE silver-plated copper cabling, Solen capacitors and Holco resistors in key positions.

The BPS power supply and 630 power amplifiers are identical from the front, with a single on/off knob and green LED in the top left hand corner, protruding from the vertical heatsink bars. The preamplifier's on/off switch and display LED are in the same position, except that the on/off knob also doubles as a tape monitor switch. Below this is the balance control, then the source selector giving the option to select tuner, disc and auxiliary line stage. The disc stage can be switched internally for either Moving Coil or Moving Magnet. Finally, to the right of the channel selector is the volume

control, which is fractionally larger than the others. In today's market, with more and more line level sources coming on stream, this amplifier is one input too short in my opinion.

### SOUND QUALITY

Crimson's preamplifier is supremely fast and dynamic, sounding as if there had been some kind of speed control put in the system - and that speed control was turned up high! It made for enjoyable - though not accurate - performances, the kind that makes you want to stand up and applaud. There was some considerable trade off between this speed and the imagery, which lost out in the melee, the Crimson seeming more interested in producing a wall of sound than a soundstage.

A complaint levelled at earlier Crimson preamplifiers was that they were bass shy; the current models have eradicated that trait altogether. However, there is a tendency to push treble sounds forward.

Combined with the speed and dynamic range of the preamplifier the Crimson was well suited for driving rock music, but with jazz or classical music it could be too sharp sounding.

Strong and forceful, the Crimson power amplifiers displayed similar traits. Imaging properties were little better than the preamplifier, although there was a slightly improved sense of depth. They were not as adept at dynamic changes but were rhythmical and capable of setting the foot a tappin' at the first sniff of a beat.

The Crimson pre and power amplifiers mesh together well, the runaway speed and dynamics of the preamplifier balancing the slightly slower power amplifiers. What was surprising was the improvement in the imaging when the two were combined. It was far easier to find instruments in the soundstage and depth improved dramatically.

A tendency to excess upper bass and a slight thickening in this area made the acoustic guitar strumming and bass on Deeply Dippy swamp everything else. It is not the most uncoloured combination in history, but it does have the ability to focus one's attention on the music.

### CONCLUSION

The Crimson Elektrik amplifiers are living proof of the whole being greater than the sum of the parts. Harder to recommend individually, the two together make for an exciting amplifier that gives a Naim 72/140 (its most obvious competitor at the price) a serious run for its money.

### MEASURED PERFORMANCE

The Crimson monoblocks produce a solid 78 watts into normal speaker loads, even though they appear compact - at least, from the front. Power increased healthily to 121 watts into a four ohm load, although a few rivals these days double power when load is halved. All the same, these power amps will give plenty of volume with most loudspeakers and rooms.

I was surprised to see low frequency response curtailed to 24Hz via the Compact Disc input. The medium is specified to 4Hz or so and subsonics do exist, so amplifiers should ideally go lower than the Crimson. Unlike some in this report, the unequalised inputs were sensitive enough at 120mV to handle low output tuners and cassette decks.

I measured little noise. Although distortion levels were low as well, at high frequencies extended harmonics exist, as the analysis shows in the row of spikes. This always suggests that some small audible effect may be detectable, more as a subtle colouration than overt roughness in the sound at such low levels however.

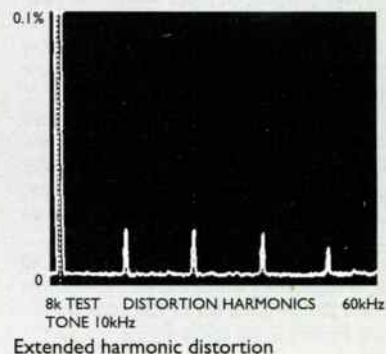
The disc stages - both moving coil and moving magnet - are even more limited in bandwidth than the CD input. In my experience, a 15kHz high frequency limit is usually detectable as a warmth in the sound. The lower limit of 30Hz is for disc warp suppression.

The moving magnet input was quiet, but a bit more hiss exists on moving coil than some in this group. All the same, the Crimson is not hissy on moving coil. The MC input is sensitive and will handle low output cartridges. Input conditions were correct.

This is a powerful amplifier, but strongly band limited also. I would expect a warm-ish or perhaps enclosed sound, but possibly a smooth and amenable one too. **NK**

	Power	78watts
CD/tuner/aux.	Frequency response	24Hz-22kHz
	Separation	52dB
	Noise	-88dB
	Distortion	0.007%
	Sensitivity	120mV
	dc offset	7/2mV
Disc (MM)	Frequency response	30Hz-16kHz
	Separation	51dB
	Noise	-79dB
	Distortion	0.007%
	Sensitivity	3mV
	Overload	110mV
Disc (MC)	Frequency response	30Hz-15kHz
	Separation	50dB
	Noise	-67dB
	Distortion	0.007%
	Sensitivity	0.13mV
	Overload	5mV

### DISTORTION





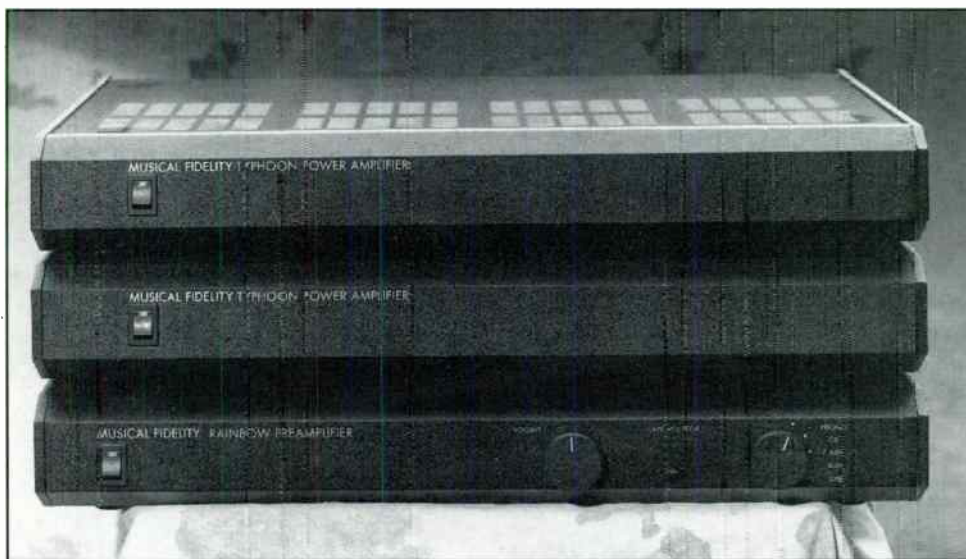
**M**usical Fidelity's The Preamp/Typhoon combination, tested a few months ago, had one minor flaw: there was no disc stage, for those who still cling to their turntables. The Preamp has been expanded into The Rainbow with a phono section for £100 more, at £299.

I have yet to discover if the name results from a meteorological obsession, or if the company is fond of D.H. Lawrence or long-running children's television programmes.

The Rainbow preamplifier and Typhoon power amplifiers are all priced at £299 and share the successful Musical Fidelity styling of the BI range. Stripped to the bone to keep costs low, they have the minimum of creature comforts, although there are some unique features.

Most noticeable is the use of balanced outputs at the preamplifier and balanced inputs at the power amplifier end. This has the advantage of being able to run long lengths of cable with minimal loss. It also makes bridging the power amplifiers easy, by means of an add-on to the main interconnect cable. Effectively this makes the Typhoon amplifiers monoblocks.

The quality of the XLR plugs and sockets and the cable is pretty basic, but it must be borne in mind that this is still essentially a low cost amplifier. The same must be said for the general build quality. The knobs have a plasticky feel.



## Musical Fidelity Rainbow/Typhoon £997.00

Facilities on the Rainbow/Typhoon are few. Both pre and power amplifier have an on/off switch at the left hand side of the front panel, while the Rainbow also has the volume control and channel selector with a tape monitor button between the two. There is provision for turntable, Compact Disc, tuner, auxiliary line input and tape.

At the rear, gold phono sockets are fitted for each of the inputs along with a

switch for selecting moving magnet or moving coil.

### SOUND QUALITY

The combination had a distinctive M-F stamp all over it: loads of character, loads of power. Although probably a psychoacoustic effect, it sounded more powerful than any of the other amplifiers in the test. When used in bridged mono mode it takes on real impact and slam. Initially impressive and successful with dynamic rock and orchestral pieces, it also works well with woodwind, solo piano or female vocal music.

Here the combination shines, with a natural attack and force. Although the stereo imagery is not in the same league as the Moth system or the Albany power amplifier, its soundstage is wide, but not too deep. Where the M-F combination scores above the others is in its bolted down solidity of the images.

This is most noticeable on the God and Gary Moore CDs. The force and power of the instruments give them a near physical presence in the room that helps to make up for any lack in image depth.

The biggest downfall is a rather coarse overall presentation, especially on phono. While all the inputs were detailed, they were not the last word in subtlety, finesse or coherence. Music bounced along rhythmically and powerfully, but artistry and grace were not its strongest points. For example, the delicate violin sounds on the Biber CD, failed to tread the fine balance between virtuosity or sounding scratchy.

### CONCLUSION

There is plenty of excitement to be had from the Rainbow/Typhoon combination, especially when in bridged mode. Sometimes there is a rough quality that is difficult to swallow, but it is tempered by sheer grunt and power. For those who want some real boogie, without spending the earth, the Rainbow/Typhoon combination could be the perfect choice.

### MEASURED PERFORMANCE

Like the Arcam Delta 120, the Typhoon can be run bridged, as in this test, to get a lot more output power. One stereo channel pushes as the other pulls, as it were, to get up to four times as much power, in theory at least. It means a stereo Typhoon becomes a monoblock, so two are needed - that's the drawback. Power of the Typhoon as standard measured 50 watts, but when bridged this rose to no less than 128 watts.

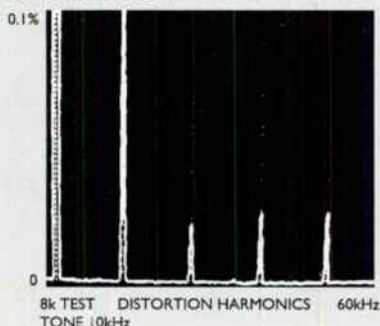
Bridging is also meant to reduce distortion, by common mode cancellation, but with mains powered test equipment, this is impossible to measure. The distortion on each stereo amp was high at 0.25%, but luckily most of it was second harmonic, which is not nasty sounding. However, upper harmonics were present too, and they do bring roughness to the sound. The situation did not worsen at high frequencies, which was an ameliorating factor.

Frequency response via the CD input was restricted to an upper limit of 20kHz (-1dB), which seems appropriate; anything above this frequency is unwanted. A lower limit of 12Hz is also sensible for this medium. The disc input on moving magnet and moving coil had the same bandwidth. The Rainbow is very quiet on its MC input, unlike earlier Musical Fidelity preamps. It also has very high input sensitivity, making it suited for top quality, low output designs. Input impedance is 47k for both MC as well as MM though, doubtless because the MC option switches in gain downstream. The Rainbow is now better than most preamps in its cartridge stages.

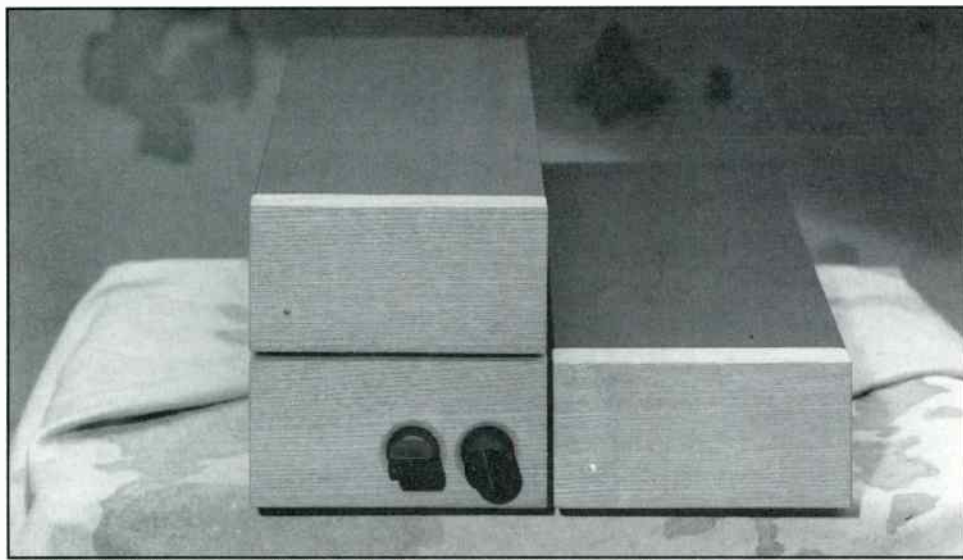
There's plenty of power in this set up, plus good matching to LP and CD. Quite what effect the distortion will have in bridged mode is difficult to tell, but inevitably I have some reservations here. Listening tests have to be the final arbiter. **NK**

Power (bridged)	128watts
CD/tuner/aux.	
Frequency response	12Hz-22kHz
Separation	108dB
Noise	-96dB
Distortion	0.25%
Sensitivity	120mV
dc offset	4/6mV
Disc (MM)	
Frequency response	21Hz-20kHz
Separation	76dB
Noise	-83dB
Distortion	0.25%
Sensitivity	2.7mV
Overload	170mV
Disc (MC)	
Frequency response	28Hz-20kHz
Separation	70dB
Noise	-71dB
Distortion	0.25%
Sensitivity	0.17mV
Overload	10mV

### DISTORTION



Strong harmonic distortion



## Moth Series 30

£508.00

The little Moth pre/power combination is designed to fit the audiophile bill, but without having to forgo the gas bill. It is essentially a three box modular device, with the capability for expansion as and when funds permit.

First of the three modules tested here is the £173 Moving Coil/Moving Magnet phono stage which comes complete with a 12VA power supply fitted as standard; an optional 100VA supply is available.

Secondly comes the passive control unit, at £132 with provision for four line inputs, tape out and output to a power amplifier. There is no tape monitor circuit. Two - somewhat fiddly - controls for channel selection and volume are on the front wooden panel.

Finally the £203 thirty watt power amplifier is similarly minimalist in its approach, with just the inputs, loudspeaker terminals and the on/off switch at the rear and a single red LED on the front. Each module carries connection instructions underneath, but in black relief on a powder black background - they are not easy to read.

With their wooden front panels - light ash, black ash, oak or rosewood - the slim boxes have a more elegant appearance than, say, the Crimson products.

Moth supplied a set of £200 Moth Link Grey interconnects, to add to the £100 Moth Link Black interconnects already in my hands, for the purposes of the test. While expensive, these do seem to be natural partners.

### SOUND QUALITY

Passive pre-amplifiers arguably should have little effect on sound quality. Comparison with the passive stage on the Pip showed that the Moth is fractionally bass shy, compared with any active stage it is seriously lacking in gain.

Although cheap and cheerful, the Moth disc stage is tonally difficult to fault, well-suited for the kind of sound produced by Pink Triangles. Certainly, although a trifle lacking in gain, it is one of the quietest

around with an excellent mid-band, without thickening or colouration. Imagery is excellent; the soundstage is wide and deep. If a criticism can be made, it is that it is too restrained; not laid-back, but merely lacking some of the liveliness of the reference, or of the Crimson.

The power amplifier is of similar stock. Unless used with ultra-efficient loudspeakers, it will never go loud. Whilst not the most dynamic power amplifier it is, however, very neutral.

As a complete system, the Moth amplifiers had a very dry sound, with no colourations or bass overhang. Imagery was excellent; the late '50s live recording of Art Blakey showed the true depth and ambience lying latent which is normally only unveiled by the finest of amplifiers.

Sound quality on Compact Disc is similarly dry and detailed, but soft and warm enough to take the sting out of harsh sounding discs, without sacrificing fine detail or focus. This is not a valvelike softness, where the richness of the valve amplifier masks the imperfections. Instead, the Moth simply softens the rough edges of whatever is played through it.

There are flaws. First, the power amplifier does get very warm. Secondly, the combination is sensitive to mains spikes; when the refrigerator switches on, a powerful thump is transmitted through the loudspeakers. In addition, as the amplifiers are so small, the rear connections are very difficult and fiddly, but this is a minor niggle. Sonically, their sophisticated air and lack of volume would not satisfy the raving headbanger. They are more suited for those looking for total neutrality.

### CONCLUSION

I was more than impressed by the little Moth products with their clean, clear, neutral and detailed sound. To get a similar quality is difficult without spending considerable amounts of money. In that respect, the audiophile Moth must rate as the bargain of the piece.

### MEASURED PERFORMANCE

The main benefit of the Moth is simplicity and electronic minimalism: it puts as little as possible in the signal path. A common drawback of this arrangement is low sensitivity, due to lack of gain in the preamp. Needing 650mV for full drive from tape and tuner, maximum power will not always be achievable. Quite a few tuners and cassette decks produce 350mV for example. Potential owners need to be aware of this - and of low phono sensitivity too. Figures of 7mV for MM and 0.7mV for MC mean high output cartridges are most suitable.

Since the Moth power amp swings just 17 volts (meaning it delivers 36 watts into a normal eight ohm load), there is little gain in the system. Noise levels are very low, but so was 'equivalent input noise'. The Moth is unusually quiet on all inputs, including disc (MM and MC). Distortion was well suppressed at all frequencies too.

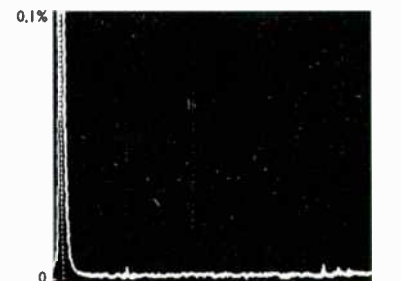
I noticed that the MC option is purely a x10 gain increase; input impedance remains at 47k, as on the Musical Fidelity Rainbow. Purists might want lower impedance - around 100ohms is usually recommended.

Whilst the CD/tuner/tape and moving magnet inputs are wideband in frequency response, the MC input subsonic response goes no lower than 30Hz - a curious inconsistency. This isn't especially sensible; moving magnet cartridges are more in need of warp filtering, yet subsonic response hits 7Hz on MM.

Low sensitivity on all inputs potentially offers a matching problem with the Moth. Run with the right (high output) items though, it will work properly. Its measured performance is fundamentally very good. **NK**

Power	36watts
CD/tuner/aux.	
Frequency response	5Hz-54kHz
Separation	82dB
Noise	-111dB
Distortion	0.005%
Sensitivity	650mV
dc offset	6/7mV
Disc (MM)	
Frequency response	7Hz-60kHz
Separation	84dB
Noise	-93dB
Distortion	0.006%
Sensitivity	7mV
Overload	200mV
Disc (MC)	
Frequency response	30Hz-46kHz
Separation	58dB
Noise	-83dB
Distortion	0.006%
Sensitivity	0.7mV
Overload	20mV

### DISTORTION



8k TEST DISTORTION HARMONICS 60kHz  
TONE 10kHz  
Negligible distortion

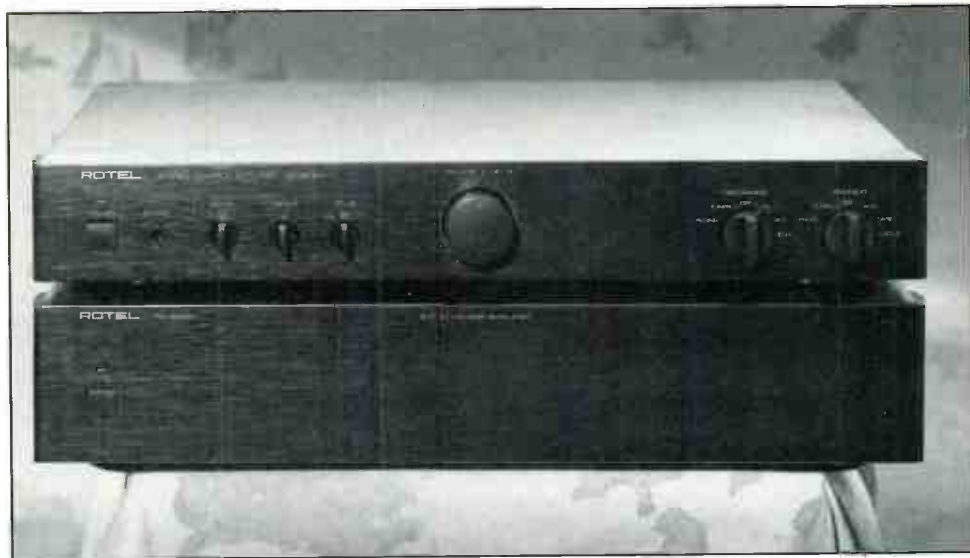
This UK-designed combination costs less than a number of respected British integrations, being offered at £159.95 for the RC-960BX preamplifier and £190 for the RB-960BX power amplifier.

So, just what do you get for £350? The RC-960BX bristles with features. It has inputs for phono (Moving Magnet and Moving Coil), Compact Disc, tuner, auxiliary line input and provision for two tape machines. As there are separate listen and record controls, tape monitoring is easy. The volume control is concentric, doubling as a balance control.

There are bass and treble controls, but there is also a tone defeat switch, to disable the circuitry. Finally, the preamplifier has a headphone socket, with its own separate amplifier. At the rear, gold plated phono sockets are used on the disc and CD inputs, together with the two sets of power amplifier output phons.

Rotel's sixty watt RB-960BX power amplifier is a heavy beast, a dual-mono design with two completely separate sets of power transformers, rectifiers and electrolytic capacitors. It can also be bridged to operate as a mono amplifier, by means of a switch at the rear. An LED at the front lights when in bridged mode.

A pair of gold-plated phono sockets supply the output to the preamplifier, while the loudspeaker terminals accept 4mm sockets and bare wire. Only their lack of sturdiness shows up the cost cutting exercises that must have taken place to keep this amplifier cheap.



## Rotel RX960BX

£349.95

### SOUND QUALITY

Dealing with the power amplifier first, it is clear that it is a budget device, although in practice it is only a few pounds more than the Moth. While the Moth lacks power, the Rotel is short of finesse.

Bass notes through the Rotel are deep - the Dead Can Dance LP set the room shaking - but notes are indistinct and overblown. Treble and mid-range had a peculiar grainy quality, which was pleasant but not strictly accurate. The power

amplifier's sense of imagery was also rather vague.

The preamplifier was quite seriously outclassed by the reference, but as there is a twenty-fold price difference, this is only to be expected. Looking at the other preamplifiers in the group, it fares rather better. It doesn't have any strange frequency anomalies over its range, sounding neither excessively fast nor slow, neither bright nor dull. Once again, there is that mid-band granularity seen in the power amplifier and the imaging properties, although tighter, are still lacking in focus against, say, the Moth.

Rotel's preamplifier could not take substantial upgrades to the power amplifier before its flaws began to show through. When they do, it begins to sound coarse, unspectacular and undynamic no matter how dramatic the music.

Put the two parts together, however and the Rotel makes budget magic. It is still a touch grainy and rough-edged, and lacks dynamic range compared to more expensive devices, but it is powerful, coherent and musical. At this low price one does not expect great subtlety. Little of the spatial information on the Art Blakey or Biber recordings made it past the interconnect cables, especially on the Moving Coil stage, which is competent, yet uninspiring.

Where the Rotel does excel is in its ability to portray the essence of the music. No, it doesn't have the excitement of the Crimson, the character of the Musical Fidelity or the dry neutrality of the Moth, but it represents a worthwhile first rung on the hi-fi separates ladder, without incurring great expense.

### CONCLUSION

This is probably the least competent of the group, but it also by far the cheapest. The quality gap between this and the Arcam and Musical Fidelity designs is not as wide as one would expect, given the massive price difference. It is, with only minor failings by comparison, exceptionally good value for money.

### MEASURED PERFORMANCE

Rotel invariably offer plenty of power for the pound; the RB-960BX power amplifier delivered 72 watts into a normal eight ohm load and this increased respectively to 110 watts into a low four ohm load. There's enough power here to make most loudspeakers go loud in most rooms, without overload. Real headbangers might need more - in excess of 100 watts - but most sane mortals won't.

The pre/power combination continues to amplify right up at radio frequencies (150kHz), something that is a bit unwise I feel. Rotel could well consider rolling off gain a bit earlier than this. There are a variety of technical arguments for doing so. Subsonic response was sufficiently extended to complement Compact Disc, however. High input sensitivity will allow low output tuners and cassette decks to drive the power amplifier properly.

There was little measurable distortion in the output of these units, levels staying well below 0.01% at all frequencies and output levels. However, listening to this power amp with the IPL S3 loudspeaker reminded me how low measured distortion doesn't necessarily equate to a smooth, refined sound.

The disc stages have extended bandwidth, like the unequalised inputs, although Rotel limit subsonic gain a bit, in order not to excessively amplify warps. The moving coil option is hissy, but sensitive. Moving magnet was quiet enough. I would suggest low output MCs are not the best choice for this preamp.

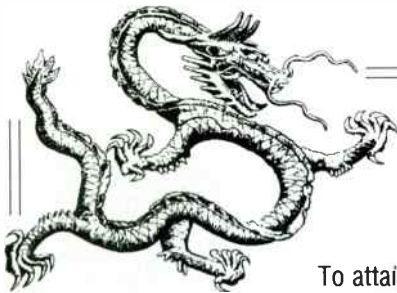
The Rotel is powerful and generally measures well, with some small reservations, notably over excessive high frequency extension and hissy MC input. **NK**

Power	72watts
CD/tuner/aux.	
Frequency response	9Hz-150kHz
Separation	83dB
Noise	-100dB
Distortion	0.003%
Sensitivity	160mV
dc offset	26/-14mV
Disc (MM)	
Frequency response	15Hz-80kHz
Separation	91dB
Noise	-71dB
Distortion	0.003%
Sensitivity	2.4mV
Overload	170mV
Disc (MC)	
Frequency response	13Hz-80kHz
Separation	81dB
Noise	-66dB
Distortion	0.004%
Sensitivity	mV
Overload	mV

### DISTORTION



Negligible measured distortion



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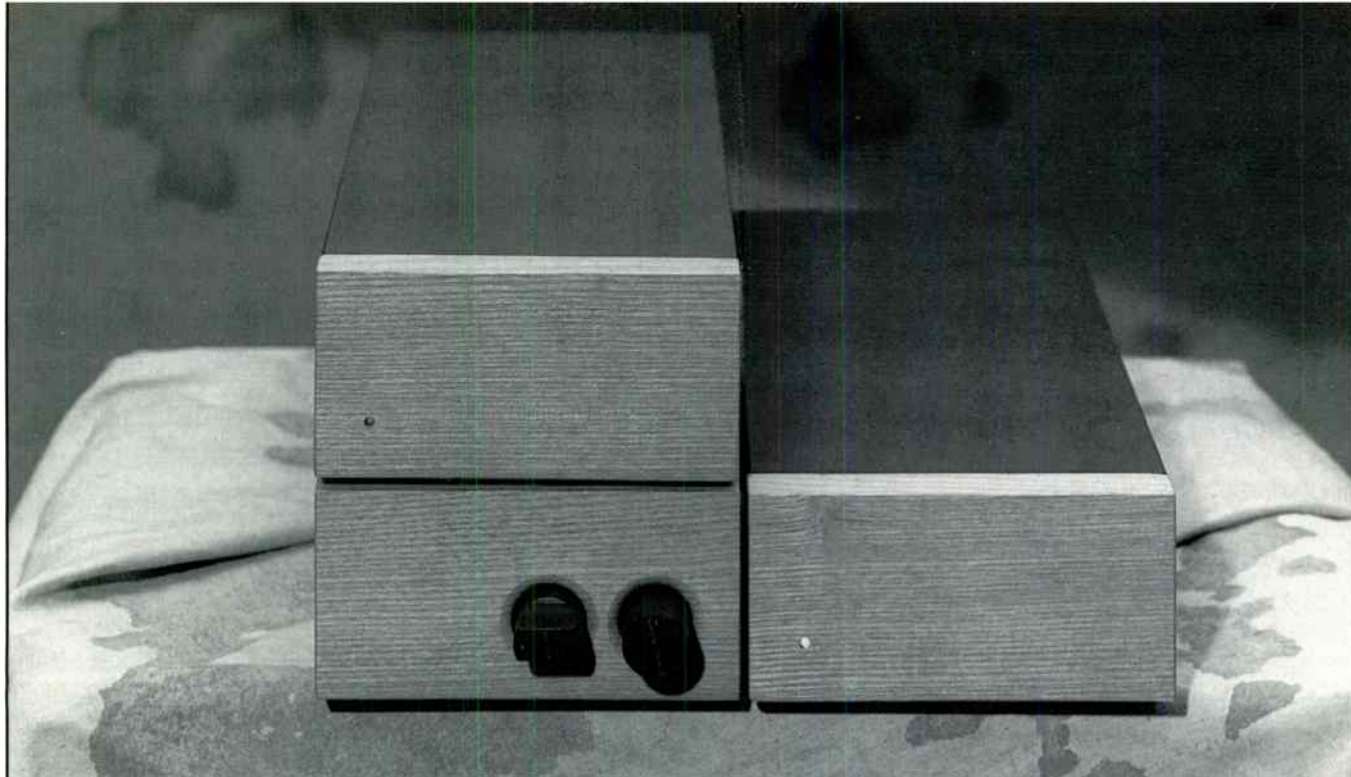
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## Conclusion

It may sound like a cop-out, but there is hardly a loser among the bunch. Each pre/power amplifier has its own set of unique virtues that make each a winner in its own class.

A clear example is the Rotel RC/RB-960BX combination. It may not have the finesse or subtlety of the finest pre/powers around, but at under £350 the superb value for money overcomes any misgivings. These units are powerful, musical and fun to listen to and sonically still manage to compete in the same league as its more expensive peers.

In a way, the Rotel is not in competition with the others in this test, being more an alternative for those who are considering a mid-priced integrated amplifier.

Moving from one extreme to the other, the most expensive amplifier combination in the test was the Crimson Elektrik. Although its lack of inputs and styling make the Crimson look dated, a fast, clear sound helps it keep up with the best of the Nineties amplifiers. Very much in the Naim mould, the Crimson's strongest aspect is a speed of attack that makes listening sessions run into the wee small hours.

For those who don't mind a touch of classic British minimalism, the Crimson's sound quality can be endearing, although it can sound lacking with some light classical music. Its dynamic range and speed prove that it is a purist amplifier at heart.

I had greater misgivings about the Albany AP4 preamplifier than I did with any other product in this test. Although competent, the AP4 holds back the superb, valve-like qualities of the S508 power amplifier. When testing the individual components, it was clear that this was the nicest sounding of the group, sounding rich and warm, yet transparent and detailed.

The preamplifier had similar traits yet it was not as graceful. The combination of Pip,

Albany S508 and ProAc Response One S is a match made in heaven, however, one that few other solid state amplifiers could better. It certainly gave the John Shearne Phase One power amplifier a run for its money.

Once again, the power amplifier half of the Arcam Delta 110/120 duo was superior to the preamplifier, but the gap was closer than the Albany combination. It could best be described as the safest pair of the bunch, well built, powerful and by far the most flexible combination in this test. It is also the only amplifier in the test to have a remote control.

Both Arcam products have a warm, rounded sound. Although detailed, it errs too far on the side of caution, sounding a touch bland. It lacks the excitement of the Crimson or the air of the Albany power amplifier. Those who need bags of power, yet dislike the forward sound of most large pre/powers will find the Arcam a perfect compromise.

Next we come to the Musical Fidelity amplifiers. Should that be Muscular Fidelity, as the word 'grip' springs to mind here? The Rainbow preamplifier and bridged Typhoon power amplifiers had the strongest character of the group and, although not the most powerful in the test, sound big, strong and have a kick like a mule.

As with most of the M-F range, the characterful nature of the Rainbow and Typhoon amplifiers suggests that people will either love or hate them. They don't suit every kind of musical programme known to man, but sounded great with loud rock at ear damage levels.

Finally, we come to the little Moth Series 30 amplifiers. They are low powered, relatively insensitive (so do not go especially loud) and the power amplifier runs warm. Yet these units would be first on my list in this group. Some may find their sound quality a little too dry, but it was admirable for its neutrality, excellent stereo and sheer detail.

The Moth's greatest strength was its sense of balance. Everything was presented in moderation, without colouration or weaknesses. Even the price is tidily balanced; not expensive enough to be off putting yet still enough to prove that it has audiophile pretensions.

Playing 'pick n' mix', dividing the various combinations, did not prove too fruitful. The quality of the Moth products and the Albany power amplifier seemed to be pretty universal, but there were no magical combinations to be had, although fortunately there were no glaring mismatches either ●



*"I recorded copies of the session onto DAT, some **Francinstien** enhanced and others not....Both the artist and the record company independently chose the **Francinstien** enhanced versions"*

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Record Producer  
U.K.



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Every once in a while one of the huge Japanese giants hits the moving target. Moving target? Well, how else would you describe the successful combination of fine sound quality, a budget price tag and a truckload of widgets?

Perhaps the proverbial blue moon shone down on Technics as the replacement for their old SL-PG500A was taking shape. Shape-wise, of course, the new SL-PG520A betrays little change over its predecessor, but fire-up this doppelganger and a decidedly more expansive and refreshing sound greets your ears.

It's this uncommon feeling of space, this lucid and highly responsive aura that identifies the SL-PG520A as something special. Uncommon, that is, at just £200 where the likes of Marantz have been exercising something of a stranglehold. Both the CD-42 and CD-52 are equally enthralling players yet they are unquestionably more coloured than the SL-PG520A.

In Marantz's favour this extra colour, this bubbling euphony, works in their interest, leaving many competing players sounding flat and, well, colourless. Almost all save the Technics in fact, the one player that retains its neutrality while detonating its music with what I can only term 'controlled abandon'!

Instead of gingerly tip-toeing through a demanding Classical Compact Disc, the SL-PG520A dives headlong into the fray, casting entire groups of instruments into a broad and deep soundstage. There's no pussy-footing here, just a player with real spirit that rarely descends into harshness or confusion.

Arnold's 'Sussex Overture' (a

Reference Recording) catches many a player off-guard with its explosive introduction, a brief fanfare of brass and strings that were immediately seized upon by the '520A. Unless you'd just touched-down from another planet it would be difficult to miss the enthusiasm of this player as it revels in the rich, rasping quality of the horns, the vivid flourishes of the violins and earthy power of percussion.

But none of this detail would be so engaging if it were not for the infusion of space, allowing each element of the music to build, to reverberate and be sustained by such a bold acoustic. The '520A never seems to put a lid on the sense of scale or drama, so there's rarely a sense of compression. And this, in turn, contributes to the freedom, the fresh dynamics and sheer easiness of its sound. Assuming your amp and speakers are man enough for the job, just wind up the wick and witness a controlled explosion of music.

#### **Delicate and Disarming**

This effortlessness is just as apparent with the most elegant of recordings, Mary Black's 'Golden Mile' included. Here, despite its deceptive simplicity, there's still a potent sense of atmosphere sparked by her voice and developed by the harmonies, the strings and percussion. Only a handful of performers, yet the '520 makes you aware this wasn't recorded in a broomcloset, the music just flows, delicate and disarming.

## *A Treat From Technics*

**Expansive but not expensive is how Paul Miller describes Technics' new Compact Disc player.**

Of course, if the CD has a naturally 'closer' acoustic - like Shakespeares Sister's exceedingly dubious 'Hormonally Yours' - then the '520 responds in kind. What it doesn't do is pump 'air' into an otherwise cluttered piece of music. So the '520A is neither perfect nor does it act as acoustic camouflage.

Naturally, the unexpected success of this player has rather less to do with blue moons and a lot to do with the quality of its engineering. Take the transport mechanism for instance. No three-beam mechanism here but a single-beam CDM4 bought off-the-shelf from Philips. Not because Technics have abandoned their own budget transport but because this token piece of Europe helps them avoid a punitive levy or two.

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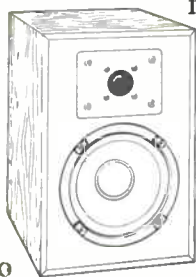
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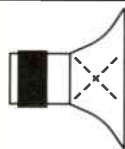
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## Measured Performance:

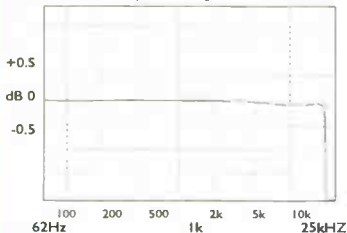
The technical performance of a modern bitstream player like the SL-PG520A is almost entirely dominated by one chip: the integral oversampling filter and DAC. In this case all the measurements scream 'MN6474' - Technics' longstanding MASH/PWM DAC. This chip operates at a maximum 32x oversampling, truncating each 16-bit word into a mean 3.5-bit package that defines just one of 11 possible pulse 'widths'. These pulses are accumulated and eventually define the amplitude of the reconstructed music signal, one sample after the next.

So much for the theory. In practice we find distortion is typically below the level of noise from -10dB to -40dB (see the -30dB plot) but emerges from this cloak both at peak levels and higher frequencies. From 1kHz to 20kHz, for example, the MN6474 DAC suffers a mild increase in mainly 3rd and 2nd-harmonics just as the output of stop-band noise reaches a -84dB peak at 24.1kHz. Hardly damning, but characteristic nonetheless.

More unusual is the 10x increase in THD detected above 5kHz once the de-emphasis routine is engaged - a deterioration in component quality perhaps? Meanwhile there's the wide 108-112dB S/N ratio (A-wtd) which, in practice, turns out to be closer to 101dB after the effects of Technics' artificial 'mute mode' are discounted. So there's a little cheating going on but, otherwise, it's all textbook stuff! **PM**

Frequency Response (-1dB)	2.5Hz-20.8kHz	
Distortion @ 1kHz	Left	Right
0dB	0.0011%	0.0012%
-10dB	0.0013%	0.0017%
-30dB	0.0091%	0.0094%
-60dB	0.220%	0.191%
dithered		
-90dB	8.95%	9.15%
Distortion @ 10kHz		
0dB	0.0221%	0.0185%
Stereo Separation		
1kHz	103.3dB	102.7dB
20kHz	60.9dB	61.1dB
Noise (A-wtd)		
w/o emphasis		-107.7dB
w emphasis		-111.7dB
Peak Output	2.052V	2.064V

## Frequency Response



Flat response

## Distortion



TEST DISTORTION HARMONICS 21k  
TONE 1k  
Negligible distortion

So Technics escape a clobbering by the EEC and we end up with a very much more affordable player equipped with what, quite incidentally, happens to be a thoroughly superior mechanism! This certainly gets the '520A off to a good start, though the remaining internal electronics are hardly shabby. In fact the components and board layout are based on the older (and highly successful) SL-PG200A rather than the lookalike '500A.

Quite simply Technics have teamed their best-sounding internal design with their most flexible budget chassis. So the SL-PG520A retains advanced features like Technics' natty 'Shuttle Search Dial' and 'CD Editing function' which encompasses an Edit Guide, Synchro Edit, Peak Search, Disc Link and Time Fade. The fast-search dial is rather alarming, by the way, accelerating to 76x normal speed without dropping into mute!

Meanwhile a matching remote handset offers a coarse digital volume control (0dB to -12dB), direct track access and programming, repeat and random play. About the only thing missing from our roll-call is an optical digital output, an omission that won't lead to many sleepless nights.

But let's be frank, or franker still. As far as the subjective pecking-order is concerned I'd place few players ahead of the SL-PG520A. Those that do have the nod are not radically different, they simply build on the very properties that make this player hot stuff at £200.

A slightly better grip of the scale and drama of the music perhaps, resolution honed to razor-sharpness, a little extra bass weight - the SL-PG520A with more of the same. Unfortunately I've not heard an exposition of this theme from any of Technics' costlier players!

But more than this the SL-PG520A is living proof that the 'front-end first' system-building concept is dead in the water. Or should that be dead in the bitstream? Anyway, instead of highlighting its deficiencies, a costly amp/speaker combination simply allows more of its vivid, expansive and engaging music to flood across.

I used the SL-PG520A to front a Rotel RA-930AX and pair of Wharfedale 505's with marvellous results. But I also plonked it at the head of my Deltac DPA100S and Audio Note J's without it collapsing into jelly. Quite the reverse in fact, for I'd be hard-pressed to combine a far costlier player with cheaper ancillaries and achieve comparable results.

So there you have it. Quite the best player to emerge from Technics in living memory and one that promises to grow with your system instead of proving a barrier to future upgrades. But if you still refuse to take the SL-PG520A seriously because 'it's too cheap' then offer your dealer £400. And take home a pair ●

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**T**wenty-five years ago, when Compact Cassette first appeared, the cry went up that reel-to-reel recording was dead. Ten years ago, when Compact Disc appeared, the cry was that vinyl was seriously debilitated and wasting away. Now with Digital Compact Cassette just a month or so away, what do we hear? Cassette itself is not a well format.

So what on earth am I doing playing with a cassette recorder from Nakamichi, the CR-7, when it costs three times as much as a fair number of DAT recorders and the first Philips DCC machine and five times as much as some pretty decent three-head cassette decks?

One thing I've been doing with it is comparing it with a DAT machine. More of this later, but it vindicated itself and took the honours. Bluntly, it beat it hands down and no messing. Don't blame me - I can't help it if there's life in analogue yet.

If you have fifteen hundred ackers, why should you spend it on a machine that supposedly is very shortly to become an outdated format? Answer: because Nakamichi's CR7 not only plays back cassettes to a standard no other machine can come close to, it makes recordings to a reference standard no other machine comes near. That's why studios buy it. It also makes perfect recording almost ridiculously easy and foolproof.

The remote control has straightforward functions - Play, Fast Wind, Stop, Pause and Record - plus two buttons with directional arrows labelled 'Azimuth'. Press either of these and a row of green LEDs lights up on the horizontal display. An arrow points to the normal position. As you press the buttons, a motor alters the head azimuth by fractions of a degree. The effect on some pre-recorded tapes - and on others made on machines where head azimuth was not quite perfect - is startling. At one point - and you can then make a note of it for the future, the sound will gain just that bit more sparkle and the recording will snap into perfect focus. I'd begun my listening session with an EMI XDR recording of

**Nakamichi's reputation for achieving the best from Compact Cassette is well-deserved. Eric Braithwaite aspires to perfect analogue recording with the CR-7 and dumps digital.**

# PRECISION & PERFECTION



Villa-Lobos and Rodrigo guitar concertos. It was extraordinarily clear. It was also remarkably quiet. It's exasperating as you go through a cassette collection and realise how many could actually have sounded that much better before. The operation becomes indispensable. Automated like this, it is also easy.

To many ears, alas, it's also going to be thought unnecessary. Yet, if you want the best affordable sound from CD, or vinyl, or radio, all these sources are liable to have three noughts after the first figure. Why do so many blench at a cassette deck that is in the same bracket? Nakamichi's CR7 I can honestly say is purely and simply worth every penny.

A constant supply of cassette recordings, many bought on sale in more - no, equally! - impoverished days, went into the cassette compartment, all apart from the inevitable duff recordings, equally satisfying. For two days I only played other sources to record from. Even though I'm used to good machines, I was still startled to hear, even on familiar recordings, a grunt from a conductor, a tinkle of music stand or a jerk in pan-potting that was more evident. There was simply more music in the music, if you grasp what I mean. It's that feeling that tells you you are listening to a top-class piece of gear.

Most prospective buyers will want to use a machine like this for recording. Why mess about with aged analogue when there's all this modern digital about? All I can say is that when it's a CR7 it sounds better. Mightily impressed

myself, I interrupted a friend's decorating and sat him down to listen. This was a blind test: I switched between a recording I'd made previously of Jazz, Classical and Rock on both DAT and cassette, with the same tracks on CD. Sources

## if cassette decks had all reached this standard more often in the last decade, digital recording systems might well have been received with wide yawns

were switched randomly. To give the Nakamichi a fair chance, the recording was made on a Maxell Vertex - costing about the same as a DAT tape. CD was Arcam's new Delta 170.3 with a Sugden SDAI DAC, which was also used for the digital feed to and from the Pioneer D500 DAT machine.

Consistently, CD came first in preference. Second - except for one track when it was preferred to CD - was the CR-7. A ways last was DAT. My guinea-pig was more surprised than I was when I told him his order of preference. In the jazz recording, he criticized the cassette copy as being less cohesive than the CD. On the other hand, in both the classical piece and the jazz, he thought the instruments had a more realistic timbre on both CD and

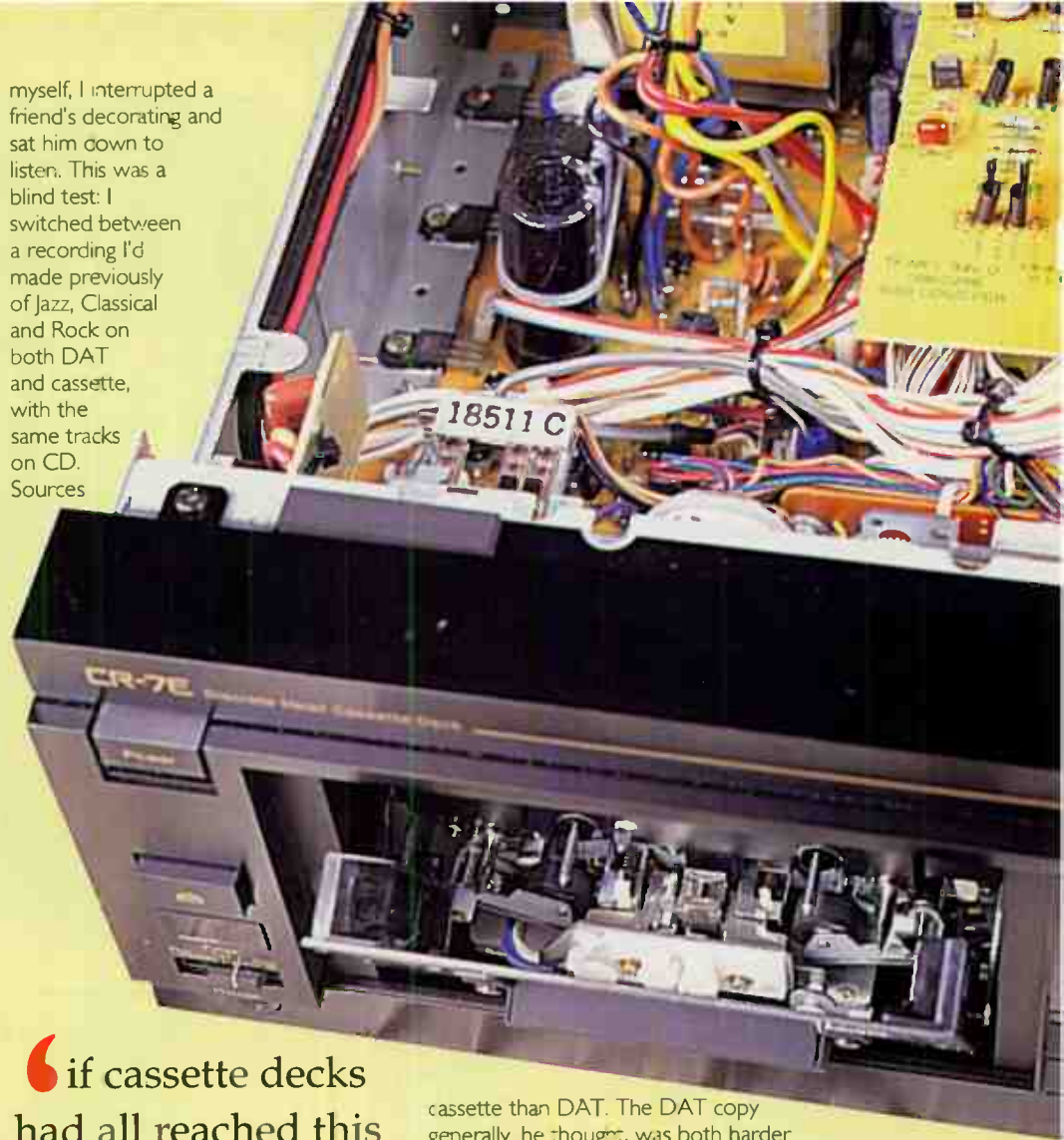
cassette than DAT. The DAT copy generally, he thought, was both harder and harsher than either, almost painful at the top end, and anomalous at the bottom. Drums, and the lower notes of stringed instruments on DAT "sound as though they're struggling to get out of the recording," he said.

All this confirmed my own analysis. Further confirmation was provided by another friend - an owner of the 'cult' 300E - who came bounding into a listening session enthusing over the quality of a tape recorded for her on the CR7. "The quality is amazing," she said; there's so much depth, so much sound!"

It's entirely true. Every nuance, every subtlety of intonation, every tiny detail of instrumental or vocal timbre, each foot of depth or width, all the attack and decay of notes and every fraction of a second of reverberation rolls off the tape. It really does become impossible to credit - except with awe - that this is a tape copy.

All the same, it's not absolute, unqualified perfection, although it's the most believable and enjoyable reproduction I've yet to hear from cassette. One of the reasons that my temporary listening panel was delighted by the 'realistic' timbre of instruments is to do with the way Nakamichi have implemented the automatic biasing of tape. Partly because the CR-7 uses a higher frequency calibration tone than usual, partly because a tape is calibrated for recording by altering bias and not equalisation as well, the system adds a

Looking down into the cassette compartment the discrete record and replay heads can be seen at centre between the capstan shafts and pinch rollers.



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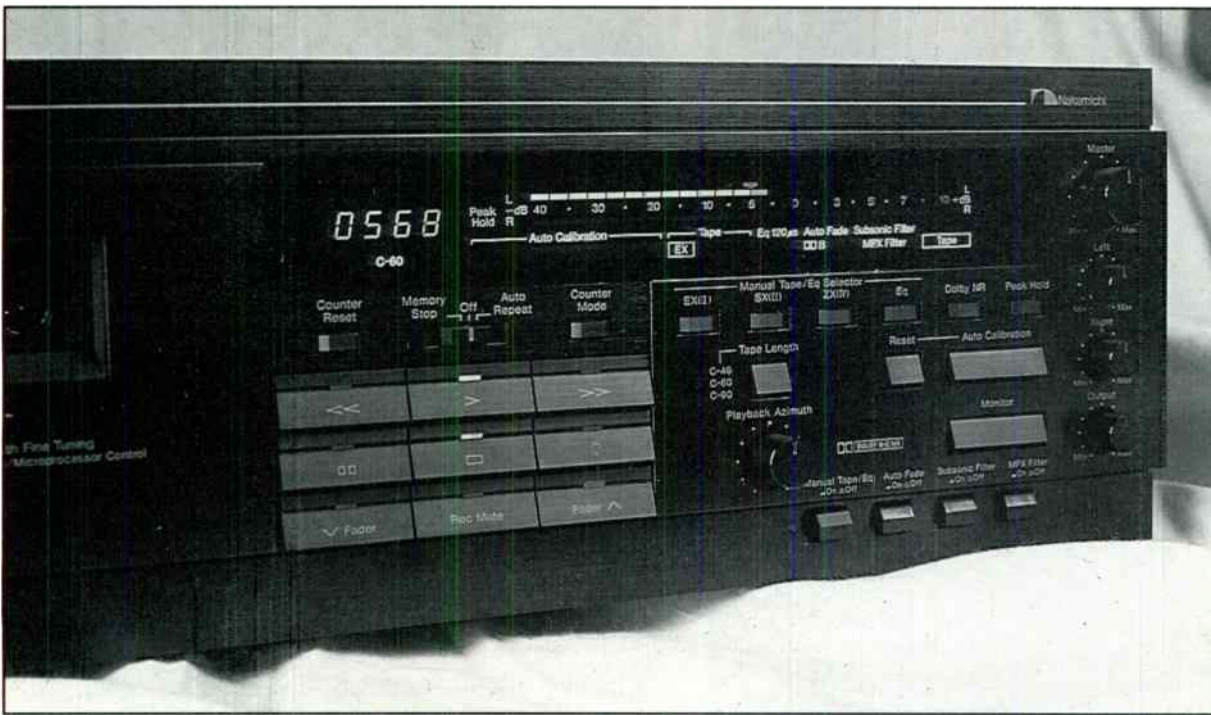
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Head position (azimuth) is shown by the record level display. Correct alignment is indicated by an orange arrow. Head azimuth can be varied by remote control.

discernible degree of warmth. This is why, I suspect, I and others noticed gut strings sounding more resinous, brass with more blare and bite and drums with more parchment.

It's noticeable more on acoustic instruments than electronic ones, where it's barely discernible in the glorious waterfall of detail. In context, though, it's an enhancement of no greater degree than a change of cable to the ideal in a system. Unlike other top-rank cassette decks, where calibration using an internally-generated tone and checking meter levels by eye, however carefully done, has to be checked by ear to avoid tonal anomalies, with the CR7 a note was never out of place. I never heard a note anywhere in the frequency range (and subjectively my listeners thought it had more range than DAT! - but I think they heard more music) fall either sharp or flat.

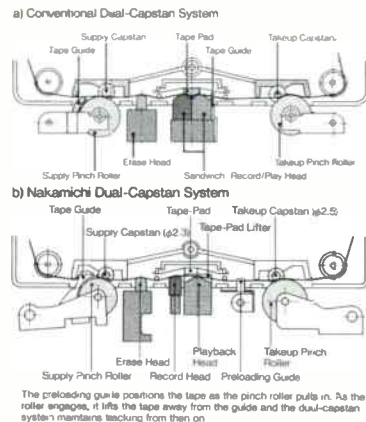
### Convenient Tuning

The tape tuning system of the CR7 is one of its greatest conveniences, along with automatic tape-type sensing. Insert a blank cassette, and the display tells you it is Chrome, Ferric or Metal and the machine selects the appropriate equalisation. (Mind you, it tells you in Nakamichi-speak: the company still stands alone in using its own nomenclature, which after years still involves them in explaining in the manual that 'EX' means IEC I, 'SX' is IEC II and 'ZX' is IEC IV. I look on it as an endearing eccentricity.) Press 'Auto Calibration' and three indicators flash under the recording display. First, the replay head is aligned and the 'Azimuth' indicator flashes for a second while this takes place; then 'Level' and 'Bias' flicker alternately as they are both adjusted; finally 'Ready' lights and the tape is automatically rewound, ready to start recording. The whole business is over in seconds.

Mistrustful by nature, I couldn't fault it. Maybe there's a breed of tape it can't cope with, but I went through a batch of the standard makes and it managed them all with equal facility, never looking flustered. It's star quality is that it produces stunning quality on all tape types: you need have no fear, when you realise you only have one tape left and there's a broadcast you must record, that it will be second rate because it's not ideally suited to the machine.

There's too little space to enumerate the CR7's other multifarious facilities, but none are gimmicks without a purpose. The tape counter can be set either to minutes and seconds or numbers; at last, on C46, C60 and C90 tapes this one really does keep time. It can also, very usefully - provided it's accurate, as this is - be set to 'Time Remaining' like a CD player. As a by-product of the time-keeping, there's an 'Auto-Fade' switch, which will fade out a recording as the end of the tape approaches - without being tricked, or without cutting in too early.

Equalisation and head azimuth - but not bias - can be overridden manually, which is handy for tapes recorded with the 'wrong' EQ. (There are occasions on which this is done accidentally on some machines, and there are times when it's useful to do it deliberately, but I don't want to go into that.) Record level is set by a round Master control, with extremely fine balance adjustment by separate Left and Right controls. There is no Dolby S or Dolby HX-Pro - just Dolby B and C. I didn't notice the lack of Dolby S, since Nakamichi generally implement Dolby tracking perfectly, and their heads don't need HX-Pro for high levels. In fact, I ran a recording on Metal tape right off the end of the display and couldn't crash it into distortion - high treble hardened and harshened, but that was all. There's also an unusual extra - a 'Subsonic' filter



**Top Nakamichis like the CR7 have a unique pressure pad lifter which reduces modulation noise, plus discrete record and playback heads of unrivalled performance: both are shown here.**

to reduce turntable rumble, the manual says. I'm not too keen on this, but it did reduce the level of cutting rumble on some Argo LP's from the early Sixties I tried, which was otherwise slightly more obtrusive on the tape than the original source.

### Last Fling

If this is cassette's last fling before digital takes over, it deserves serious consideration as a recording medium. In fact, I would be tempted to say that if cassette decks had all reached this standard more often in the last decade, digital recording systems might well have been received with wide yawns and mumbles of 'So what?' It's the kind of quality that leads you to believe cassette still has a valid future. O.K., it's expensive. So what? Compared to the cost of a top CD transport and DAC or high-end amplification, the price isn't out of order. If you have a large collection of cassettes, if you are serious about recording off-air, aspire to the CR7 ● ▶▶

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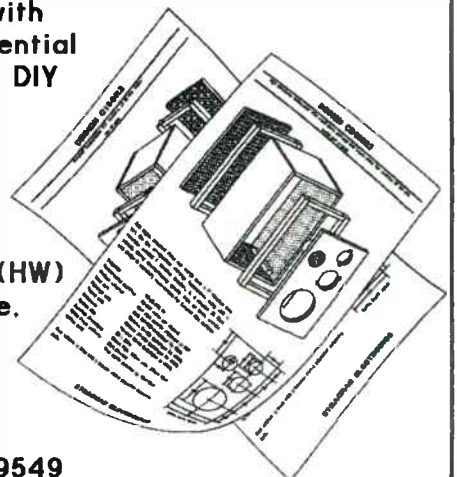
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**Measured Performance**

The CR-7 uses Nakamichi's best heads and transport mechanism. Whilst other manufacturers buy in these items from outside suppliers, or have them manufactured to order, on their top decks Nakamichi make their own. The discrete Permalloy record and replay heads are not siamesed together, meaning they are not prealigned to avoid azimuth error and the loss of treble that results from it. That's one reason why top Nakamichi's have head azimuth adjustment, either of the record head - as in the ZX-9 - or of the replay head, as in the Dragon and CR-7E.

The main benefit of keeping the heads discrete comes in low distortion. Or seen another way, this means that Nakamichi's heads provide higher record levels before running into serious distortion. This CR-7 differed from earlier samples I have tested; it offers even higher mid-band overload levels, but at the expense of treble overload. It follows current Japanese fashion in doing so; bias levels have spun up to dizzying heights recently, presumably in leapfrog attempts to better the opposition. No one can get higher levels than Nakamichi though - and the CR-7 proves this with alacrity. I auto-tuned TDK MA-XG metal tape then measured overload ceilings.

Top cassette decks currently hit around +7dB; the CR-7 hit +10dB. At this level - one that's unsurpassed by all rivals - the record level display had long since gone past its upper limit. When Nakamichi designed the CR-7 even they hadn't foreseen the likelihood of such recording levels being reached one day. High coercivity metal tapes and correspondingly high bias levels have changed all that, as the CR-7 so amazingly demonstrates.

Tape engineers will want to know at what expense to treble overload though. Well, the IEC suggests something like a 6dB over-drop is about right for most music programme, a figure I go along with as sensible. Bias is now set so high on the CR-7 that high frequencies run into overload at -0.5dB, which is a 10dB over-drop - rather excessive in my view.

**Superb Heads**

Quibbles about overload ceiling apart, the discrete heads of the CR-7 still offer superb performance. Listening tests show that in practice, bass distortion hampers cassette decks rather more obviously than treble saturation. Bass lines commonly go soft and soggy before treble overload and self-erasure become severe. Bearing in mind that Rock music bass lines can be not only prominent but also of consistently high level and you can see why this is so. High level treble signals tend to be transitory, so the 'splash' of treble overload is far less noticeable and intrusive. Where the siamesed heads of other decks produce around 3% distortion at low frequencies (40Hz, Dolby flux), the CR-7 produces 0.6% - that's five times less distortion. I notice consistently on my own ZX-9 that its clean bass lines differentiate it more significantly from other decks than anything else.

The frequency response analysis shows how auto-tuning coped with TDK MA-XG metal tape. It gives a very flat frequency response that stretches smoothly from 11Hz right up to 20kHz within fine 1dB limits. Earlier CR-7s had a bass hump at around 15Hz I seem to recall; this CR-7 does not. Instead, it has a peculiar and very sudden

low frequency roll-off below 11Hz that I suspect is associated with a filter or some attempt to ensure flat low frequency response. The subsonic filter used to eliminate the hump - hence its presence. Now it just moves the bass roll-off frequency up an octave to 20Hz, which seems to be of little value to me.

Like all top Nakamichis, the CR-7 has especially stable treble output and very low modulation noise. Even with chrome and ferric tapes, high frequency output is stable right up to 20kHz and frequency response, after auto-tuning, as flat or flatter than that shown in the analysis of MA-XG. With all tape types, it gives a very even tonal balance and little of the jitter and graininess heard with lesser machines.

**Real Life**

Combine ultra-high recording level with low noise (-75dB with Dolby C) and you end with a dynamic range of around 85dB from a deck like the CR-7. Trying to record speech for a radio jingle, I recently had to abandon DAT as unusable without a peak limiter but found instead that my own ZX-9 (which is much like the CR-7 in performance) coped easily, with not a trace of hiss audible (using Dolby C). It underlined the amazing real-life ability of a top Nakamichi to me. A ZX-9 (and therefore a CR-7) will even outperform open reel decks running at 7.5ips I have found. That's just how good cassette has become.

The trouble with digital tape systems is their inviolable upper recording limit. Go through it and severe distortion breaks out. With live speech recording level has to be set so low, in order to accommodate large level changes, that even 90dB dynamic range digital systems become noisy. Because of the way analogue tape systems overload progressively, they can accommodate such range changes with ease. In real life, a cassette deck like the CR-7 actually has more usable range than DAT and, therefore, DCC I suspect. So cassette isn't so far beneath the potential of the latest digital systems, at least when handled by a deck like this one.

It used to be the transport mechanisms of Nakamichis that were remarkable, but not any more. The dual-capstan, direct drive system in the CR-7 works very well, but it is marginally bettered by rivals these days. All the same, a wow figure of 0.03% is so low that any improvement would be barely detectable. The CR-7 has a pad lifter to reduce modulation noise and at -44dB this is unusually low. The speed stability analysis shows low drift and wow as thinness of the test tone spike at right. Capstan wow 'shoulders' are visible either side of the spike, but they are low. There is a small flutter peak to the left of the test tone that worsened the flutter figure slightly. All the same, the CR-7 still manages well and, with a pitch stable source, will retain the sense of solid pitch that is associated with CD.

**Better Tracking**

Replay frequency response, which affects both the tonal balance of prerecorded tapes and compatibility with other recorders, followed the usual Nakamichi pattern. It measured flat to 14kHz, above which treble output starts to rise. At 20kHz, it is +2dB up. This makes Dolby B track better with prerecordeds I find, giving a brighter and clearer sound.

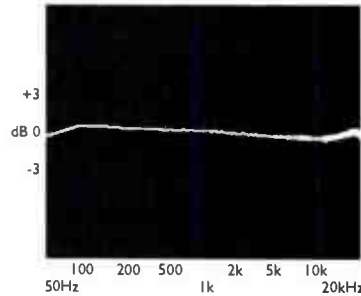
This latest CR-7 should be used only with the best blank tapes, because of its high overall bias levels, and because it lacks

Dolby HX PRO. With the right tapes, it offers unrivalled recording performance from Nakamichi's amazing discrete heads. The transport is superb, if now occasionally bettered by the smallest amount. All the same, this deck remains my all-time favourite. There's no doubt that it is a technical marvel, a legend in its own time. **NK**

**REPLAY** (prerecorded tapes)  
 Frequency response (-2dB) 30Hz-20kHz  
 Speed accuracy +0.3%  
 Hiss (70uS, Dolby out) -63dB

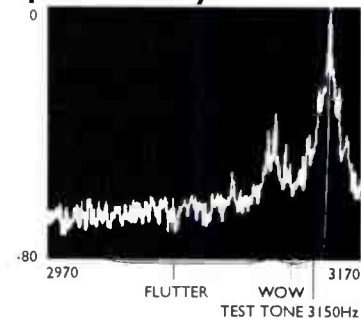
**RECORDING** (blank tapes)  
 Frequency response (IEC Primary Refs.)  
 ferric (IECI) 20Hz-20kHz  
 chrome (IECII) 20Hz-20kHz  
 metal (IECIV) 20Hz-20kHz  
 Separation (1kHz) -61dB  
 Distortion (315H) 0.2%%  
 Hiss (70uS, Dolby out) -57dB  
 Speed variations (DIN total) 0.03%  
 Flutter energy (3-3.13kHz) -44dB  
 MOL/SAT (IEC Refs) 315/10k  
 IEC I (ferric) +4dB/-4dB  
 IECII (chrome) +3.5dB/-5dB  
 IECIV (metal) +7dB/-3dB

**Frequency Response**



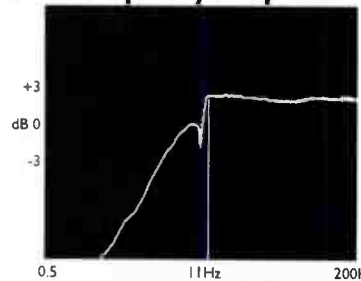
Frequency response with TDK MA-XG metal tape was flat from 11Hz up to 20kHz after auto-tuning.

**Speed Stability**



Speed stability from the dual capstan transport was very good. The spike at right is the test tone, showing good sharpness here, due to low drift and wow. A flutter peak can be seen to its left.

**Low Frequency Response**



Low frequency response is flat down to 11Hz, then plummets quickly below that frequency, as this analysis shows.

I'm an elegant, fastidious, arty sort of bloke, really. I mean, I read the Arts pages of the Independent before page three of the Sun on the way to work (since Eric walks to work this might explain why a No36 bus ran over his foot the other day - Ed.). Knock back the odd glass of Chateau Pomeroy in the Wine Bar. I've been known to slap a Chicken Supreme in the Microwave, even cobble up Cordon Bleu beans on toast. But my lifestyle seemed to be lacking something.

What was missing in my life was Lifestyle with a capital L. So, I requested a Lifestyle system from Mr Bang and Mr Olufsen of Denmark - the B&O system 2500. It has speakers, cassette player, Compact Disc and AM/FM tuner, all in a neat, slimline package having rows of

Thirty seconds or so after you've selected your source, the doors slide closed automatically, leaving the works lit up. Leave it alone, after a while it will revert to Standby and the lights go off. These antics had me musing over the Chablis. Wouldn't it be useful if you only had to wave at a CD player in passing for its drawer to open? Or salute an amplifier for it to turn on? Answers on a postcard, please, as to which hi-fi company would be most likely to require the owner to put their hands together in prayer for theirs to switch on . . .

A quick wave, the doors open and reveal the vertical clamp over the CD compartment. Press 'Load' and it swings up. Press again, the clamp swings silently down and you're ready either to set it

The instruction book is very clearly laid out in simple steps with illustrations of all the controls, so a new user would find their way around the machine very quickly. But I found no mention of recommended tape types, not even whether the deck accepted Metal tapes. Practical experiment suggested that metal tapes would be of little additional advantage over a good Ferric or a Chrome. This is an auto-reverse deck with Dolby HX-Pro, so convenience is seen to be of some importance.

Though recordings made with Dolby HX-Pro and Dolby B (there is no Dolby C or S) had a splendidly quiet background, user convenience - and the 2500 is a joy to use - does compromise sound quality. Recording level is automatically set. I agree that for the Lifestyle system buyer who wants to take a system out of its box and set it going without complications, manual recording level is fraught with pitfalls, but it did tend to squash dynamics on Rock music, giving tape a rather flat and bland sound. It diminished the advantages between Ferric and Chrome types also

Against this, it is worth reiterating the fact that B&O's System 2500 is ridiculously easy to set up. I had it out of its box and running in five minutes. (It's superbly packed, by the way.) Something extremely helpful here is that the connecting cables - including mains leads - are all taped into channels on a plastic panel which slots neatly into the back of the main centre section. Even if you have never applied yourself to hi-fi before, it's hard to misconnect anything - all the relevant plugs appear directly opposite their appropriate sockets.

I only have two quibbles here: while the instruction book is clear about the order in which the system and its speakers should be set up, the DIN plug terminated interconnects to the speakers are fiddly to mate up - there is not a lot of space.

#### Further Apart

The second quibble is that the leads supplied are pretty short, the speakers - which match the central column perfectly - lodging neatly alongside the main unit. Alas, however attractive this might appear, it puts the speakers just a few feet apart. Ideally, they should be five or six feet apart: Please, B&O, supply a spare set of longer cables. - and an AM aerial!

The latter is needed because while a telescopic VHF aerial comes supplied, the AM aerial socket is a continental type. Although plugs can be found, it's not easy, and B&O system buyers are not the sort, methinks, to delve into electronics spares shops. I used a piece of wire which worked reasonably well. B&O's tuner section is decently sensitive on AM, though somewhat subject to burbling. All the same, it turned out to be quite reasonable for listening - not top rank, but better (on AM) than that of many hi-fi tuners I've had through my hands.

On FM, the tuner scored well, even with the whip antenna. Radio 3 was

# BANG TO RIGHTS

**Eric Braithwaite slightly changes his life-style to suit Bang and Olufsen's 2500 system.**

tiny rubberised control buttons in the middle. Not an old-fashioned round knob in sight.

Various stylish people who were round at the flat couldn't resist it. There was a minor dispute over whether it was 'elegant' or not. Stylish, yes; very 'designer'; compact - and quite heavy, too. 'Handsome' was the final consensus, in the way any design where form follows function purposefully and without whimsy is handsome rather than pretty or elegant.

Mind you, there is one part of this system that does strike people as whimsical at first. We've all shaken our fist or stuck up two fingers to an amplifier or malfunctioning bit of apparatus on occasion, but have you ever seen people regularly waving at hi-fi? Neither had my friends until they saw me flapping my hand at this B&O. Two smoked glass - yes, glass, not acrylic - sliding doors cover the CD, cassette mechanism and controls. Pass your hand a few inches in front of it - it has to be a cross between a regal wave and a salute - they slide open and two lights on each inner edge of the business compartment glow. No buttons to push, just proximity.

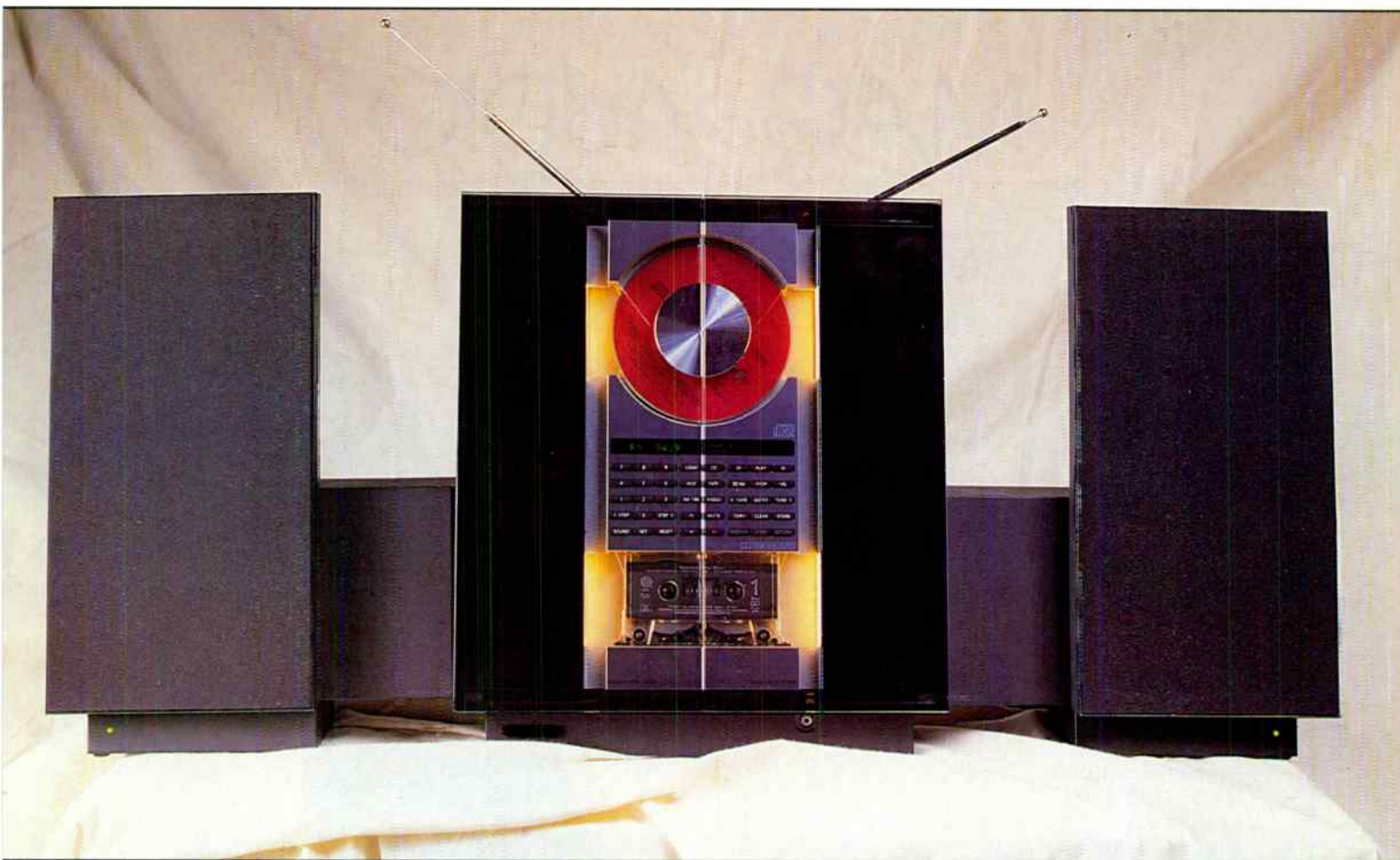
going with Play or programme a sequence of tracks using the numerical keys below and to the left. These are usefully dual-purpose - they also control the preset FM/AM stations. There are one or two slightly anomalous labels on some of these buttons, which mostly affect the radio section; for CD, it is that Stop doesn't stop the CD revolving, it's the equivalent of Pause. Selecting another source or pressing Load halts it.

The green display above the control section displays the source selected, and for CD, track number, time elapsed or time remaining. It's both reasonably discreet and legible - but not from too far away.

CD sound was quite dynamic, clean and detailed. Given that the speakers couldn't be placed particularly far apart, it offered a fairly full and enjoyable sound with a decent spread. A check with headphones (there's a minijack socket discreetly placed in the base below the glass doors) confirmed that the CD player wasn't letting the side down.

Press Tape and the cassette section comes into action. Like the CD, this is vertical: the cassette simply slots in. Cleverly, the same control buttons can be used for B&O's own music search system: a cassette 'track' can be selected and displayed. All this is very user-friendly. Recording from the 2500's tuner or CD is relatively simple: select the source, press the green labelled button for Record twice and the cassette starts turning. Again, a little space-saving idea allows the CD Track Skip buttons to serve as Fast Forward and Reverse for the cassette.





more than acceptable, though in some positions showing signs of hiss. FM was clear and cheerful, with good overall tone - a friend passing through remarked on its sonic attractiveness. An external aerial feed was even more rewarding, producing even more detail and delicacy, though with some toppiness in the treble. It was a very good performance by and large, all the same.

Rather to my disappointment, though the instruction book refers to being able to give names to preset stations which can then be called up from the memory, this can only be performed with a 2500 which is RDS-equipped. Mine wasn't; for prospective owners - who are not likely to be familiar with tuning into stations by keying in frequency numbers, this would be indispensable. While the automatic search functioned well in picking up stations of decent strength, programming selected stations (both AM and FM) proved simple in method but taxing in remembering which was which. An RDS display of station name or type installed in the memory would make the tuner easier to use. Buyers would be best advised to ask for the RDS version, I think.

With an integral system like this, it is all too often the speakers which become a mere afterthought. While B&O's are clearly designed to complement the system visually, they also manage to do so in sound quality. Being very slim, with a heavy base and heat sinks behind, they turned out to be a

**‘you need have neither a mechanical bent nor a degree in logic to use it**

reflex ported design which produced some quite startling bass for their small size, especially near a wall, which is where this system is likely to end up. In fact, B&O sent along an extremely well-finished black wall-mounting bracket which would be well worth using if you have £110 left over. An additional extra, which is decidedly useful, is an optional remote control, the Beolink Terminal at £89, which duplicates all the control functions, and adds a timing facility.

I loved the looks and the ergonomics. Those tiny rubberised buttons offer every control function required, with cues on the display so you need have neither a mechanical bent nor a degree in logic to use it. As an example, press Sound, and first up on the display is 'Volume'. Press the Up or Down button and the display gives you a numerical readout from 0 to 90; next comes Balance, left or right. Central is 0, the extremes are 7. Then Bass and Treble which display from +6 to -6. Last (as it ought to be!) is the Loudness control, which flashes on the display if it's off, or

stays steady if it's on.

I became quite attached to my new lifestyle, even. Style is definitely the word. I had the 2500 in my kitchen and my bedroom for a while, as well as my normal listening room for the critical listening session. A major plus is that it produced consistently decent sound wherever it went, being distinctly unfussy about positioning.

With the smoked doors closed, it becomes part of the furniture, unobtrusive but present in the subtle way that only really good industrial design achieves.

#### **Designer Ambience**

Just 'round the corner is a friend's flat with the perfect ambience for B&O's little designer masterpiece. Smoked glass mirror walls, pine floor - and so on. Sound at the moment is from a midi system which inhabits a corner, simply because it doesn't take up much space. B&O's System 2500 wouldn't have cost much more. It would certainly sound better, take up less space, and wouldn't have to be hidden by pot plants. I think I'll suggest it.

And lastly? Well, a system with this kind of appearance and oozing quality requires different criteria to a run-of-the-mill midi system. It's a bit like the response of salesmen to enquiries from the hoi polloi about that car with the winged lady on the radiator. If you have to ask, you can't afford it. It'll set you back £1,900. But look at the competition. Its ugliness hadn't seemed half so obvious before ●

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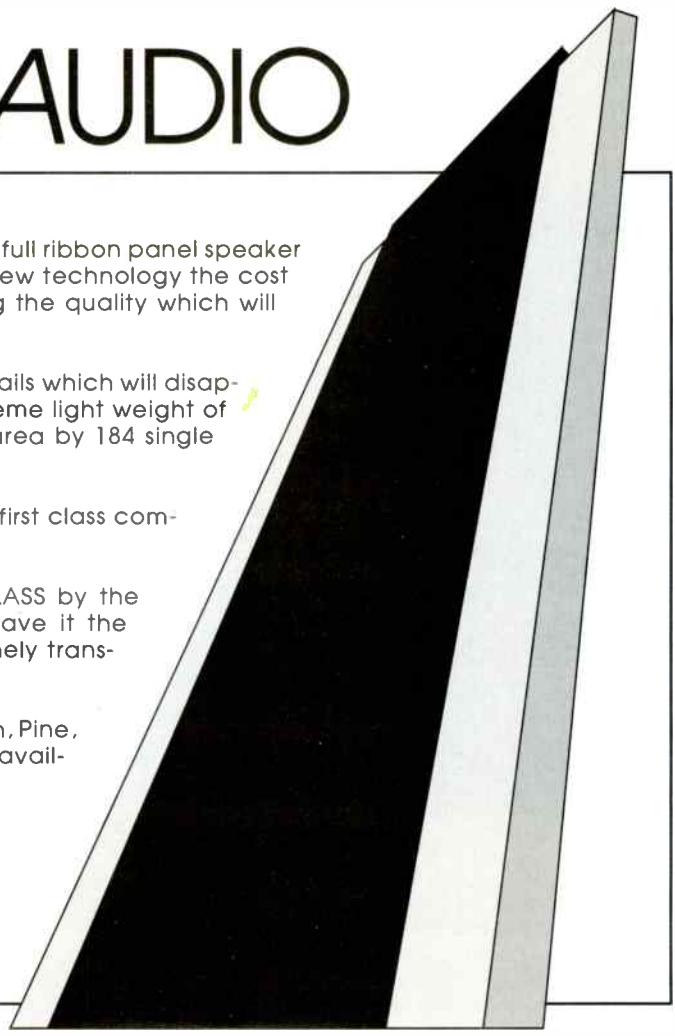
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# Southampton Chips

“Compact Disc and Digital Compact Cassette chips are designed in Southampton.”

“But Philips are a Dutch company.”

“Yes, sure. But UK engineers in Philips Components help develop the chips here.”

**Left: A member of Philips CAD/CAM design team, working on the layout of a new chip.**

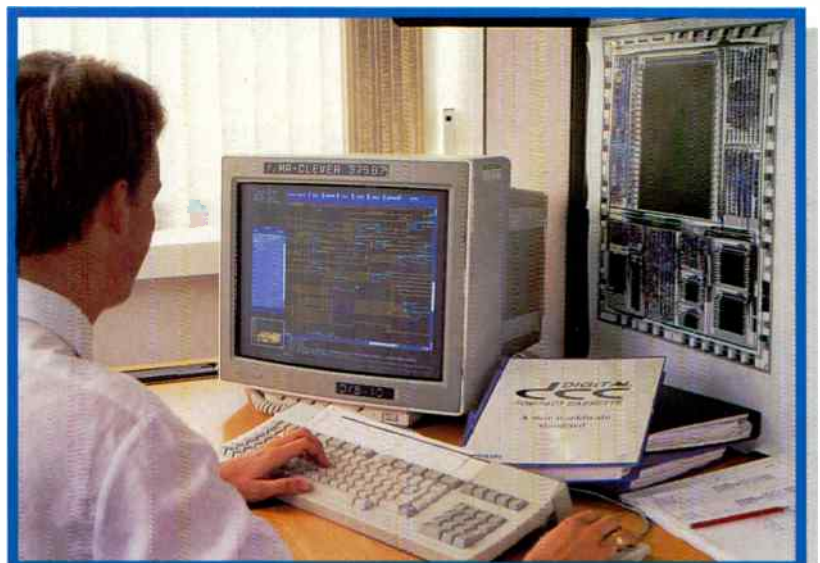
This casual interchange over the telephone surprised me. How come I've had to get up at 6 a.m. to catch a noisy, wave hopping (and seriously misnamed) Fokker Friendship that made me regret ever having looked at a breakfast, to get to Holland when the answers to my questions could have been gathered with a telephone call or, at worst, a train journey to the seaside?

Wrong! This is a multinational company. The people I have visited in Holland were Philips Electrical, those who make the final gizmos. They use silicon chips and specialist parts supplied by their Component division, a branch of which exists in Southampton. It's these guys who have been working on DCC for some time, since obviously, the chip sets come before the final

product. We organised a visit.

Not faced with a grey and turbulent English Channel to cross, a 10 a.m. start and a lazy drive down the M3 in the sun was in order. We even had time to sit down and have a coffee by the waterside, watching the ferries weave in and out and contemplating a life as captain of one. Looks great when the sun's out.

Philips' Southampton branch went for many years under the name of Mullard, the company set up by Captain



Stanley Mullard in Hammersmith back in 1920 to make thermionic valves for radios. Philips had a financial interest from 1925 and bought it outright in 1927, but kept a low profile (to avoid stirring up xenophobia about a British company being foreign-owned) until 1938. It seems even the Inland Revenue didn't realise, for they wanted to know why Mullard himself (who became Managing Director) wasn't declaring dividends from shares which in fact Philips now owned. Throughout most of the period, Mullard valves were actually assembled from Philips components. Until 1939, in fact, it was said that the only British part of a Mullard valve was the vacuum inside it! The link to Philips' main centre in Eindhoven goes back sixty-seven years, from the day in 1925 when the Dutch replaced Mullard's 'primitive' machines with semi-automated ones.

"With the SAA-7350 and the TDA-1547 we were really trying to move forward from what we learnt from the '7320. Some people say they think the '7320 sounds better, but it does depend upon how you use them."

Generally, chips from Southampton carry the SAA prefix; those from Nijmegen the TDA prefix. The TDA-1547 came out of Nijmegen too. It is this latter chip which Deltec use in the PDM-Two convertor. Both this and the '7350 are reckoned to be the best low-distortion Bitstream chips so far.

Another chip, destined for use in Digital Sound processors, offers two curious alternatives to the usual Church, Hall, or Concert Hall ambience: a Bathroom sound (hmmm) and - heaven help us! - a Cave. Would-be hermits and Thrash Metal Neanderthals look out. No-one seems yet to have spotted the intriguing fact that it also

offers digital scratch suppression for analogue LPs for other primitives who still have black disc collections. Interested manufacturers can ask about the PCF5020/A.

"We have two new chips due out that both relate to hi-fi use. There is the new TDA-1307 eight times oversampling digital filter that has been designed to fit with the TDA-1547." (TDA 1547 is known as 'DAC7', used among others by Meridian and Deltec for convertors and by Mission in their DAC5 which we reviewed last month.) "It will improve the performance of the '1547, but it isn't out till the end of the year (1992). This will provide manufacturers with a Bitstream chipset for CD that should give even better performance than that being achieved now."

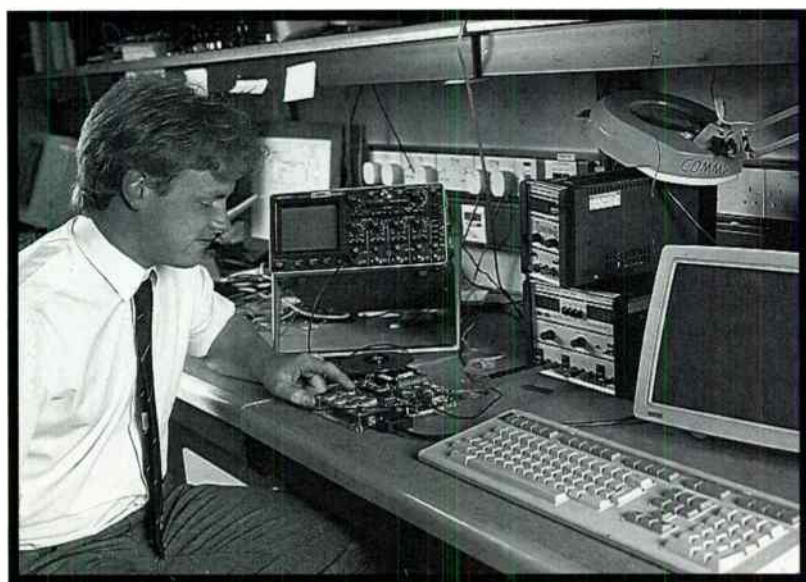
"Another new device is the Bitstream Analogue-to-Digital (ADC) device, the SAA-7360. Eventually, this will be used in DCC recorders to convert analogue sound into a digital signal."

With Compact Disc, British top-end hi-fi manufacturers have done very respectably with niche products incorporating crucial parts designed and manufactured by Philips, notably the transport with its laser optics and the chip sets. The complexities of Compact Disc are well appreciated by British manufacturers, who these days are more speedy and imaginative in their implementation than most.

Anyone contacting Philips Components in Britain speaks to the men at Mullard House in London. And of course, all real power and decision making lies in Holland. Consequently, few people hear about the role Southampton plays in the development of some of the world's most advanced digital hi-fi technology. **NK**

**The TDA-7345 and TDA-1301 digital servo IC under scrutiny in conjunction with support circuits.**

**Below: The history of Digital Audio, according to Philips in Southampton.**

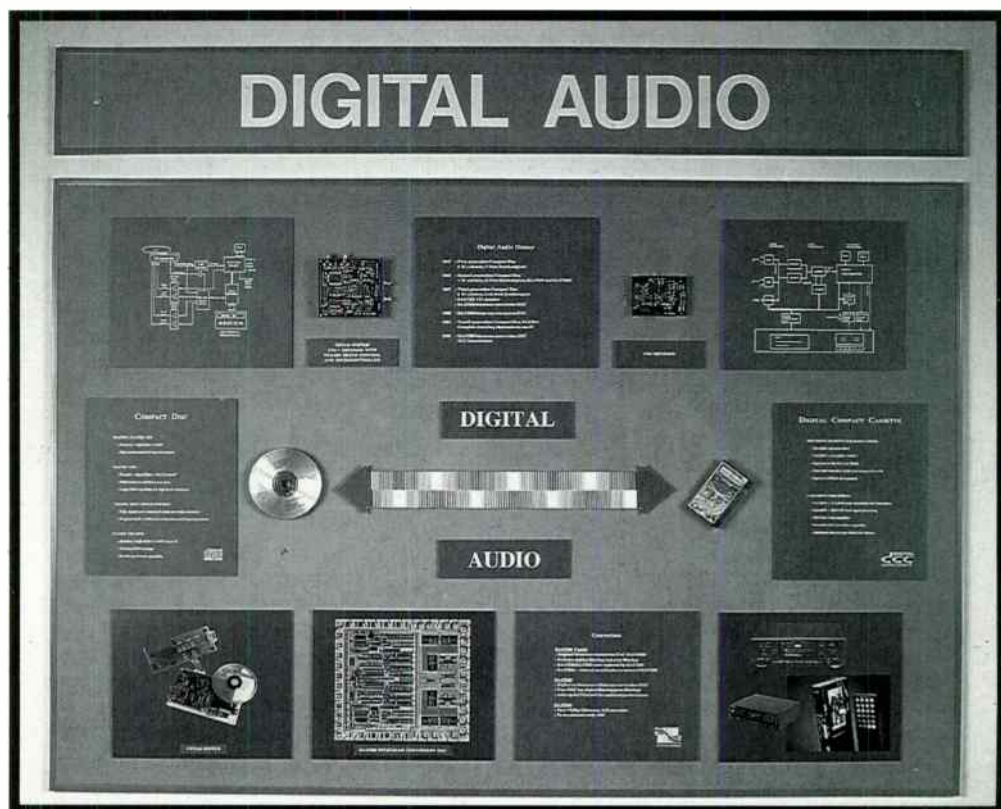


Although Philips (as Mullard) acquired the Southampton site in 1955, the modern building we visited went up in 1988 when Philips finally lost their reticence and re-named the business Philips Components. And, just as I was told, there in the entrance lobby was a wall display showing DCC parts, including the large scale integrated circuits developed at Southampton to a specification laid down, in the first instance, by the research labs at Eindhoven.

### Southampton Supports

Although Southampton designs the ICs and develops support circuits, the chips are made (fabricated as they put it) in Nijmegen, Holland. Quite who decides to do what depended entirely upon the individual situation, we were told by Dave Slowgrove of the International Product Marketing Department.

"Sometimes the specification comes from Eindhoven, sometimes not. With the SAA-7350 [Bitstream] for example we set out to improve the earlier SAA-7320, but with DCC, which was a new technology, we worked with a specification from Eindhoven."



**H**arman/Kardon's £169.95 TU9200 AM/FM tuner carries on in Harman's new style, with a curved section running across the full width holding the controls and the display window. Finished in matt black with gold lettering - the name and designation much bigger than is usual these days - it does have the look of simple clean elegance. I've come to sigh over fascias crowded with tiny buttons; the TU 9200's controls are ones you can really get your fingers on

on the display, along with the letters AM or FM depending which is selected, and the word Stereo unless the broadcast is in mono, of course. If you're using memorised stations, the number and whether it is in block A or B will also show up.

Basic, isn't it? I'm not complaining. If the sound is good, then I don't particularly worry about there not being any illuminated pyramids, bargraphs, revolving piecharts or any of the other visual distractions that increasingly

well, provided that you remember to use the 'Seek/Stereo' button when scanning for FM stations. Otherwise you might find yourself inadvertently listening in mono and wondering where the width went.

Stereo reception, as far as width goes, was well up to the mark for the price, though this is a tuner with something of a forward presentation. Depth and ambience in a live broadcast of Prokofiev's Waltz Suite, and later of Mahler's Fourth Symphony, were short-

# well-rounded reception

**Harman Kardon's  
TU9200 tuner, in a  
new round-edged  
style also turned out  
to be good all round,  
as Eric Braithwaite  
heard.**



instead of trying to stab one with your fingernail.

Don't be misled by the sparse array of controls on the front, however. Admittedly, with many tuners of Japanese origin now clocking up forty presets, sixteen now looks small change; space is saved here by using just four rocker switches to programme in eight selections combined with a Shift key to double the total. FM or AM stations can be allocated any number. Once in memory, each will retain its mono or stereo status, so beware - if for some reason you didn't press the 'Seek/Stereo' button on the right for stereo when programming, you will hear the station in mono next time.

A word of praise for the layout at this point. It is very logical: Power on at the left, well away from anything else; programming and preset controls next to the display panel and band, mono/stereo and tuning over on the right. In conjunction with a splendidly clear manual with huge illustrations (well, by normal standards; some you need a magnifying glass for) it's as simple to use as it looks.

Tuning is by Up and Down keys whereupon the tuner will stop at strong signals. A frequency read-out will appear

clutter up tuner displays these days. If I want more light in the living room I'll switch on a lamp; if I want to watch something orange moving, I'll buy a goldfish. Maybe I'm jaded. I would have liked a signal strength meter, but since few tell the truth, I suppose I can do without. Provided you've had an aerial properly installed, your ears will tell you whether a distant or weak station is worth bothering with. On this score, I was relieved to discover Harman advise switching to mono for weak transmissions instead of the fake 'Blend' circuitry others sometimes adopt.

## AM Loop

Equally simplistic, the back is bare but for two pairs of spring-clip terminals, one set for the AM loop aerial supplied and the others for the ribbon aerial also in the box. (Don't use it unless you must!) A male co-ax socket takes the 75ohm aerial feed and there are two phono sockets for stereo output. Mains lead is a captive two-core cable.

In terms of gizmos and illuminations, this tuner might be a bit skeletal compared to the competition - except for the British, of course, who make a virtue of user-friendly (i.e. hardly any) control panels. Nevertheless, it functions

changed somewhat compared to the reference Quad FM4. A strong signal is indispensable; the Prokofiev - on both tuners, despite a six-element aerial on the roof - was marred by an odd 'ticking' interference the day of the listening session, which was much more obtrusive on the Harman Kardon. There was also a degree more of hissiness behind Radio Three. Anyone who sets this tuner up with the wire aerial supplied is going to be rather unhappy unless they are within walking distance of the transmitter, I suspect.

For all that, reception on Radio Three turned out fairly well, with cellos, basses and brass round and fruity. Overall there was a good feeling of orchestral texture, though fine insight was a bit lacking. This tuner issues a relatively warm, well-rounded sound, but it paints a picture in broad brush strokes rather than a finely-detailed pen-and-ink drawing. Individual elements do take their place, sometimes irritatingly so; some clanking of music stands in live performances was a little over-emphasised, and what idiot was it who took a baby into a performance of Mahler's Fourth?

There's a clue here to the H-K's sound. While by and large this is a very

smooth performer, it's mostly so in the mid-range. For example, there was some sense of constriction in dynamic range, for all that flutes and woodwinds - on Jazz FM as well as R3 - floated free into the room. Announcers' voices, while avoiding extremes of sibilance had a very slight lisp to them, and the males were less barrel-chested, less deep-voiced than is normally the case.

Even on heavy Rock, there was a mild feeling of constriction of dynamics, as though some of the full range was pushing from the inside trying to get out - even taking the dreaded compression of Rock stations into account. It meant, however, rather than display Optimodding in all its full horror, on all stations the TU9200 turned music out of a warm, caring kind of mould.

A little more gutsiness, a little more

brashness, would have been welcome, as would a little more precision in terms of image. If orchestral colour was a fairly broad wash, then Rock and Jazz, while forcefully forward and very lively, could also be heard as though through a thin gauze curtain, softening the edges of instrumental images - though not their attack. Listening to mono broadcasts, the central image was spread a little wider than the norm.

Tuning was easy and pretty well faultless, the search system opting for the stronger signals and not being waylaid by less optimal ones. Programming stations into memory was also simple and foolproof, thanks to the ergonomics. This is by no means one of those machines where you need to read the manual more than once. If you've had a synthesised tuner before, you might not even need to read it at all.

Turning to AM, there was less of the 'early telephone' or 'cocoa tin' school of sound quality than might have been expected. Here again, the warm aspect of the TU9200 paid off, the compressed rock stations taking on a reasonable degree of life and vitality instead of the

miserably squashed and undynamic muffled sound that far too often passes for music in two-waveband tuners. On BBC 648, there was some burbling, but stronger stations like Capital Gold came in well, as did some of the clearer foreign ones. Once again, automatic tuning sailed by the weaker, noisier transmissions and settled on the better. No complaints, here; there has to be better AM reception, but these days anything which is more than simply listenable becomes practically recommendable.

### Good All Round

Harman-Kardon have adopted some sensible compromises in the TU9200. It's not of the 'reveal all and now 'phone the BBC to complain about the last engineer's mistake' school of thought; nor does it offer the lean, dry and somewhat antiseptic sound of a number of current Far Eastern tuners. Pleasantly rounded and warm, it doesn't stray over-far in that direction either. In short, it's well balanced without excess, and likely to have a broad appeal. A good all-rounder, it's well worth the money ●



### Measured Performance

This neat looking tuner from Harman measured quite well but, irrespective of price, it declared its budget status in certain key areas, ones that manufacturers seem to use as price point determinants. I am thinking mainly of hiss, but also of MPX filtering. It may be that to get these into a good state does cost extra money, so perhaps they decline naturally as build budget falls.

Whatever, the TU9200 is, by current standards, a bit hissy at -67dB. As I regularly state in my tuner reviews, hiss really needs to be lower than -70dB to be inaudible. Otherwise we know that fussy Radio 3 listeners in particular will be complaining. And why not? A hi-fi tuner should be able to reproduce Radio 3 without obvious flaws. In practice the hiss I am talking about will be faint, not fierce. The continuously high modulation levels used by music stations drowns this sort of thing, as it is meant to. Don't expect Radio 1 or whatever to be obviously hissy; it won't be. But Radio 3 is a different proposition (even though judicious use of Optimod has been prescribed, I am told by a Beeb engineer who says I musn't reveal his identity!). In a well recorded classical piece (i.e. a recording that doesn't hiss) with extended low level passages, or with a live broadcast from a studio, then the

picture will change: hiss will be detectable from the TU9200 and, for some, irritating I suspect.

Harman have not used pilot tone filtering, so pilot at 19kHz, sub-carrier at 38kHz and higher frequency signals accompany the audio output. They will block Dolby action of recorders not having their own selectable filters and may produce whistles too. These days, pilot tone is usually filtered out, but it does cost extra to put in the necessary filter.

Leaving out the usual MPX filter makes getting a flat and extended frequency response all the more easier. The TU9200 measured very well in this respect, as our analysis shows with its horizontal straight line. Limits were 18Hz-18kHz, wide enough to ensure the tuner has an even-sounding tonal balance in use.

Channel separation on stereo was variable; it depended upon modulation level, which is rather curious. However, staying better than 30dB and hovering around 50dB at normal average music levels (50% mod.), it is not a problem that should be audible.

Distortion comprised second and third harmonics, at around 0.3% level, just enough to reduce smoothness by a fraction but not enough to be overtly obvious or nasty. Around 0.2% is a common enough figure for a budget tuner; more expensive models measure around 0.1% these days.

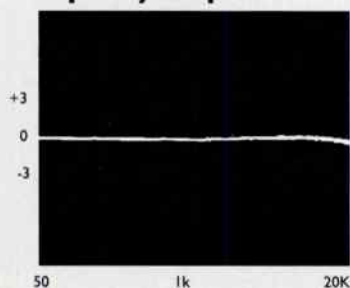
The tuner's sensitivity to really weak stations was rather average, measuring 4µV. Around half this value is more common. Similarly, weak stereo transmissions had to come in at 40µV or more for low hiss; some tuners manage half this value. Selectivity between closely spaced stations of differing strength was excellent at 87dB.

Although basically competent, the TU9200 does have some minor technical

weaknesses. All the same, final judgement of its worth has to be made upon sound quality, because in many areas that matter because they directly affect sound quality, it does quite well. **NK**

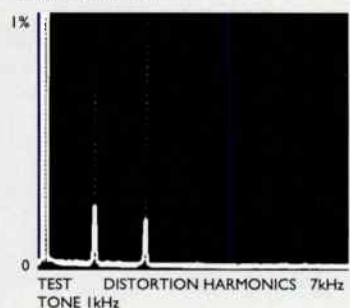
Frequency response	18Hz-18kHz
Stereo separation	53dB
Distortion (50% mod.)	0.3%
Hiss (CCIR)	-67dB
Signal for minimum hiss	0.5mV
Selectivity (at 0.4MHz)	87dB
Sensitivity	
mono	4µV
stereo	40µV
signal strength meter	none

### Frequency Response



Flat frequency response

### Distortion



Second and third harmonic distortion

Integrated amplifiers which use valves are rare beasts indeed. Yet Hi-Fi World was recently engaged in an evaluation of the £1,250 Audio Note OTO integrated amplifier in the June issue, and now we have yet another, the AMT CVT 3030 at less than half the price (not to mention the Unisys in this issue). Remarkable for its hybrid design, and only £450, the 3030 represents the marriage of a classic ultra-linear valve output stage with transistors and - in addition - integrated circuits used for the rest of the circuitry.

There have been other hybrids and a few are still available; for example, Luxman have used triode valves,

casing, is a full facility amplifier measuring 43cm wide by 11.2 cm by 25cm deep, and weighing no less than 12 kilos.

It includes a moving magnet phono input, plus six auxiliary line inputs including tape. Outputs include tape record and - surprisingly - headphones, though this signal does not emanate from the valve output stage. A front panel switch allows headphone monitoring for normal use and tone bypass, the latter the usual Baxendall type bass and treble controls. Balance is provided in the form of a concentric volume control allowing differential setting of the gain. The review model was clearly a

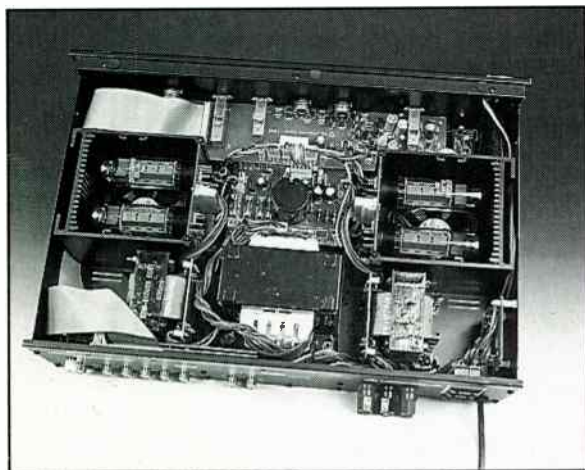
as the solid state competition. Excusing some mild roughness and edge in the upper treble which produced a slight 'sting', the broad mid range of this amplifier was smooth, fluid and cohesive.

Good transparency helped develop the sense of stereo perspective while the resolution of detail was also very good. Focus was stable and vocals were reproduced with a natural balance and good expression. The overall character of this amplifier helped balance that tendency for Compact Disc to sound hard and uncompromising.

Given the strongly musical quality of the 3030 it was easy to place it at

# VALVE VALUE

**Martin Colloms savours the rich flavour of the hybrid CVT 3030 valve amplifier from Malcolm Blockley's Campus International.**



Power output valves can be seen at left and right, with cooling fans beneath.

visibly glowing behind small windows let into their unit front panels, for line level amplification. In these products the output circuitry was the normal solid state variety. Other hybrids have involved valves throughout, except for the final output section which reverted to solid state in the form of valve-like FET devices. The designers of these various hybrids all assert that there is something nice and musical about a valve, so it is a positive step to try and include a few in a design to achieve a 'better' sound.

Valve purists on the other hand would argue that all-valve circuitry is best and ask 'why compromise?' The answer is simple - cost. The new AMC product is a serious attempt to bring valve technology down to an affordable price and present it in a practical package.

Here's what you get for your money. Presented in a large, full width and rather conventionally styled

well-used pre-production demonstrator and a better build and finish is of course expected from the full production examples. The back looks straightforward enough, with an impressive array of gold plated sockets, including heavy duty binding posts for the power output connections. Undereath there was a surprise - two small fans fitted to the base to provide forced air cooling for the potentially hot interior. Those valves are totally enclosed within the case, not left sticking out, the usual expedient to allow heat to convect and radiate away.

Not knowing what to expect from the 3030, it was used with a variety of speakers including the sensitive Wilson WATT 3 (used on the 4 ohm tap setting) while the auditioning was aided by the loan of Hi-Fi World's Audio Innovations Second Audio power amplifiers. Other amplifiers for comparison included the Mission Cyrus Two, Audiolab and the Musical Fidelity B1.

Kicking off with the line input, fed from a Meridian 200-203 CD source, the AMC proved to be an able performer with an overall sound well up to the standard expected from this class. It provided good timing with a lively, crisp effect which was not at first very reminiscent of a valve sound.

The sound was light-textured, until the 'direct' switch, which bypassed the tone controls and their mild frequency response errors, was thrown. Now a richer valve-like flavour developed and this amp's real ability shone through, except for the low bass - which was not as firm, extended or as percussive

the forefront of amplifiers in its class. Via the disc input the sound quality was not quite so strong, though the rating was still high. That clear, lively, quality remained and the AMC was a welcome antidote to those designs whose blandness verges on the boring.

As regards system matching, in view of the slight 'sting' in the treble, cartridge and speaker choice should avoid those models with correspondingly spitty or over-sharp treble.

## Measured Performance

Inside, the CVT 3030 is organised as seven boards interlinked by detachable harnesses, a method that allows very quick module changeover for replacement or servicing. Unusually, no sockets are provided for the output valves; they are soldered in pairs to the output modules, one module for each channel.

Each module is a complete power amplifier, including bias setting arrangements and a matched pair of valves. In the event of failure, a factory-aligned replacement may be installed in a few minutes. The disc input board is placed local to the respective input sockets to minimise hum in particular, while the headphone amplifier is also local to the headphone socket. Both these boards use integrated circuit amplifier stages.

Other boards include the power supply, 390uF capacity (at 400V working) for the main HT reservoir, plus various chip regulators for the lower voltage transistor sections.

The line amplifier circuit is discrete while the power amplifiers use a combination of bipolar input and high voltage FET drivers to feed the EL34 output valves. These are operated in fixed bias Class A mode. The moderately-sized output





This has been an interesting product for assessment. The AMC CVT 3030 is a well-packaged integrated amplifier for the money with sufficient power for most of the more sensitive speakers and is blessed with quite straightforward matching requirements. Academically the sound quality was fully up to the required standards; only you can put a value on the 3030's approach to a musical 'valve' sound at an affordable price. As for me, I liked it ●



Above: The 3030 has a simple style. Ours was a used prototype.

Left: Outputs are provided for 4ohm and 8ohm loudspeakers.

transformers are specified down to 30Hz but are not designed to operate over that final stretch to 20Hz - there is not enough iron and primary inductance to do it at this price.

Of classic ultra-linear configuration, the valves and transformer have a mutual feedback connection, the balanced primary taps feeding the second grids for local negative feedback. The overall negative feedback is specified at a moderate 14dB. The output transformer secondary is directly linked to the output terminals.

It is rated at 30+30w, 30Hz to 40kHz for no clipping, distortion unspecified, and this output is good for both 8 and 4 ohms via the additional 4 ohm matching terminals. At low, music-related powers the distortion claim is 0.02%, 1W, 50Hz to 20kHz.

A quick checkover showed that the output was weak at 20Hz where it measured only 8 watts, but the amp soon came on song above 30Hz. By 50Hz 32w was available, with the mid band power rising to 35w per channel. Distortion towards full power was typically 0.3% falling to 0.08% at 1 watt. A point to watch was the relatively high output impedance of almost 1 ohm, a fairly weak damping factor of 8, which will mildly affect the bass quality and tonal quality of most speakers. (Incidentally, the output impedance of the Audio Innovations designs are rather higher

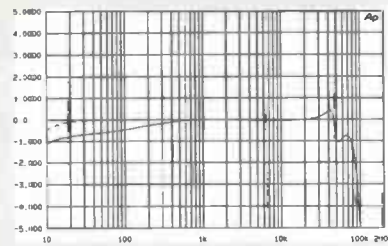
than this.) Line noise was satisfactory at -65dB, (CCIR 1kHz, ARM weighted) while the moving magnet input noise was fine at -73dB weighted. Channel separation was typically 60dB, well maintained over the bandwidth.

On frequency response, 8ohms load, it was flat from 20Hz to 20kHz, but with some ultrasonic ripple indicating some minor transformer resonance effects. Via disc, there was a hint of loudness contour with a touch of lift in the bass and treble, in practice pretty harmless at less than 0.5 dB of error. MC

**Test Results**

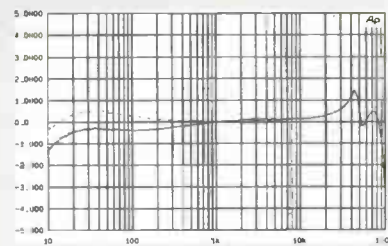
Power	35watts
<b>CD/tuner/aux.</b>	
Frequency response	10Hz-50kHz
Separation	67dB
Noise	-65dB
Distortion	0.2%
Sensitivity	230mV
dc offset	none
<b>Disc</b>	
Frequency response	12Hz-40kHz
Separation	-dB
Noise	-73dB
Distortion	0.2%
Sensitivity	3.3mV
Overload	-mV

**Frequency response via CD**

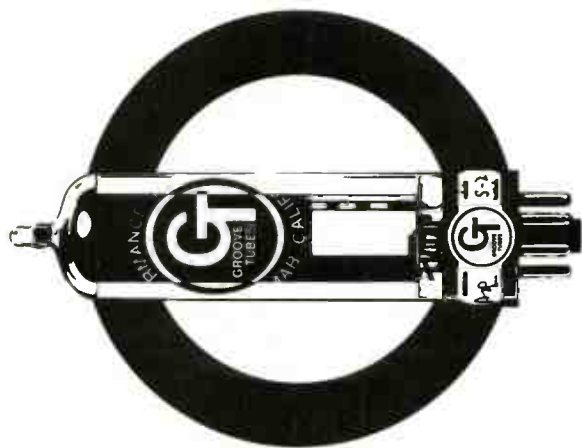


Some ultrasonic ripple

**Frequency response via phono**



Mild loudness contour with tone controls in (broken line).



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“They sound better than anything else; I love them; they’re warm and rich.” A simple observation perhaps, yet this ode to the valve is the reason Malcolm Blockley wants to do it all again: start a company that is.

Sitting in a delightfully misshapen room, its old timber beams having settled to strange, unplanned angles over hundreds of years, Malcolm was reticent about his past: “I’m sometimes referred to as a co-founder of NAD,” he said, “but I left in 1985 when I sold my interest in the company. Campus is not an attempt to simply revive that past, so much as to revive the best of the past. I want to help develop a range of AMC products that offer valve sound quality, but at affordable prices. This way, almost anyone will be able to buy a valve amplifier. I believe there is a big market for such products.”

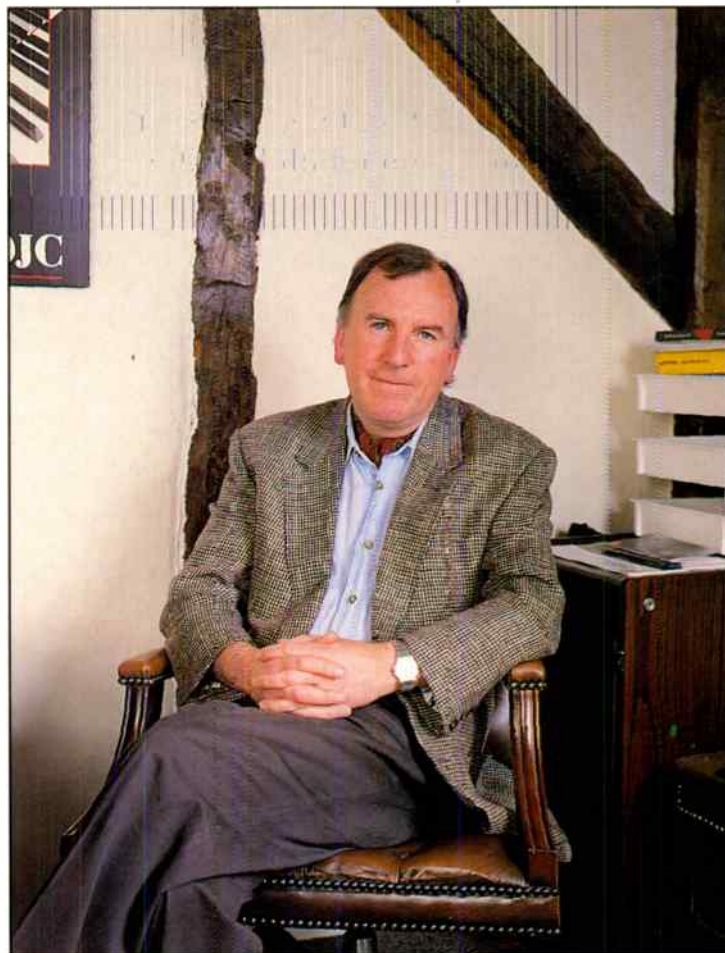
We spoke about his future plans in Old Amersham, a perfectly preserved market town, complete with ancient higgledy-piggledy houses, tucked into the Chiltern hills in Buckinghamshire. The relative tranquillity of this traditional, rural market-town setting seemed curiously at odds with the fax machines, computers and artefacts of modern business that tilted this way and that on the uneven floor and shelves around us. “To get prices down we have to manufacture in quantity, which in turn means supplying a global market. We

Outside Britain interest in them is stronger. So we got together and decided to use the AMC brand name, one that has appeared before on a few other products, for what we hope will be a whole product range in future, based upon valves. I am spearheading the product design initiative.”

I asked whether this might be dangerous, should interest in valves be a fashion that peters out. “If it sounds better, then it will be taken seriously and not be subject to the vagaries of fashion,” Malcolm replied. “We have taken the 3030 hybrid amplifier round to experienced dealers and they have been delighted with it.”

### **First Major Product**

Similarities with NAD in the early days are too great to be ignored. NAD’s first major product was an amplifier called the 3030. And NAD also started out



## *Birth of a Brand*

### Noel Keywood speaks to Malcolm Blockley about his plans for new hi-fi marque AMC.

have distributors for AMC products in the U.S. and Asia; Campus International is the distribution arm for AMC throughout Europe,” Malcolm told me.

Malcolm had hinted at these intentions days earlier, when collecting the unusual AMC CVT 3030 hybrid amplifier from us, tested by Martin Colloms in this issue. We made haste to Buckinghamshire as a result. How had he arranged to found a company that from the outset could work at this level I asked? “The letters AMC are the first three of Amcli Lin’s name. His I.E.E.E. group of companies manufacture some product for NAD in Taiwan. But in sub-contract work there is constant pressure from customers to keep price down to a minimum, which means small profits. It is unstable too; if offered a lower price elsewhere customers disappear quickly.”

“I have worked with Amcli for many years now and we know each other well. He wanted to produce his own products rather than somebody else’s and, being geared up to manufacture in volume, needed a global market. Basing products around valves is my idea.

with a strong U.S. connection, one that Amcli Lin and his I.E.E.E. manufacturing group has sought to repeat. “What do U.S. and Far Eastern customers make of an Englishman specifying an unusual range of products like this?” I had to ask. “Britain has a good reputation around the world for producing novel yet well-priced hi-fi equipment,” Malcolm pointed out, “so it is easily accepted.”

So the CVT3030 amplifier is just the first item of a comprehensive range planned to be introduced over the next few years. Next comes a solid state Bitstream CD player, the CD-6 (£329) that will match the 3030. “This gives a CD-based system with the benefits of valve sound,” Malcolm observed. It will be followed by a valve power amplifier which, in bridged mode, will produce around 80watts per channel. A solid state matching preamplifier with phono input will accompany it. “We are going to try to produce the power amp. for £299,” Malcolm told us, emphasising the competitive pricing policy they intend to adopt.

The speed and structure of the new

set-up was underlined by an interesting incident. Standing in the street, wary of traffic wardens, clamp vans and tow-away trucks prowling London’s streets around us, I had hurriedly explained the need for a valve tuner to Malcolm when he came to collect the CVT 3030 from us. No more than days later in Old Amersham he told me that he had put the idea to Peter Bath, formerly of NAD and Dolby, who was in Taiwan working in conjunction with the Taiwanese design engineers. Peter became quite excited by the idea of something radically different that would clearly justify the use of valves and was now in Japan investigating component supply. They thought it likely an AMC all-valve tuner would be made available in roughly twelve months, costing less than £500.

So the CVT 3030 is not a one-off. It will be followed by a succession of AMC valve products, manufactured in Taiwan, priced to be affordable and sold around the world. They will be Malcolm Blockley’s ode to the valve ●

**Conservation in Old Amersham; Malcolm Blockley preserves the best of the past.**

The Mordaunt Short Classic 20 is not a nostalgic speaker although its name might suggest otherwise. While other manufacturers might use the 'Classic' tag to imply a reiteration of some highly respected bygone model, Mordaunt Short's Classic 20 doesn't hark back to the obvious candidate for revision, the much-loved and similarly proportioned MS20.

The old MS20, to which I'll declare my unashamed sentimental attachment

having sold it by the bucket-load when I was in retail, was in hindsight a rather rough and ready budget box. But partnered with a Creek 4040 and either a Rega Planar 3 or basic Linn LP12 turntable it made for a particularly musical and captivating starter system. The Classic 20, at just under £400, is several price steps removed from being an entry-level product and is considerably more sophisticated.

I would suggest that the 'Classic' designation refers more to its traditional

appearance. The review samples came finished in a particularly attractive mahogany veneer. A smart but discreet brass name-plate affixed to the lower portion of the front baffle adds a subtle touch of elegance to the cabinets. To maintain its well-finished, tidy demeanour the drive unit fixings are concealed behind concentric fascia mouldings. All that disturbs the continuity of the baffle are the fixings for the grille cover. The speaker sounds better with the covers off so enthusiast listeners will have no

# CLASSIC CONSERVATISM



**Malcolm Steward mulls over the looks and sound of Mordaunt-Short's Classic 20 loudspeaker.**

choice but to gaze at the four small rubber sockets doing their sore-thumb act.

The real-wood finish doesn't extend to the rear panel but this is of little consequence as the speaker should be used within eight inches of a rear wall. This part of the cabinet features another brass panel, which carries the system's technical specifications and serial number. Above this is a plastic lined reflex port and below it a plastic connection tray with four gold-plated binding posts to facilitate bi-wiring.

At the time of the review I was deluged with amplifiers for a pre/power group test I was conducting and I chose one, an Audiolab 8000C/P combination, to complement my regular Naim NAC52/NAP250 set-up and the Audio Innovations 200/Series 1000 monoblocks that provide me with valve power when it's required. Front end components were my Naim CDS CD player and a Pink Triangle-modified Linn Sondek turntable with Naim ARO tone-arm using Audio Note Io and Linn Troika cartridges.

All the source and electronic components were used on Mana tables, and the speakers themselves were placed on Epos stands, which positioned them at the appropriate height to give the best tonal balance and the fastest, most clearly defined bass. Mordaunt Short supplies an optional dedicated single pillar stand for the Classic 20. I didn't have this to hand but tried the speaker on similar massive designs,

including real heavyweights from Huygens. 'Try before you buy' is the best advice with supports but my money stays on the lighter, open-framed types for their more agile if more lightly-weighted low end performance.

The Classic 20 isn't a troublesome or finicky speaker to get working. Placed either side of a large bay window, a couple of feet clear of side walls and toed in gently towards the listening position it performed smoothly from the off. Provided, that is, that it was driven with sufficient amplifier muscle. To get the sound out of the boxes and into the room meant cranking the volume control determinedly to the right. However, a degree of restraint also proved to be necessary: this wasn't a speaker that could soak up power regardless. If you stuffed it with too many watts it quickly became less graceful. French, Frith, Kaiser and Thompson's 'Loch Lomond' from the Invisible Means album appeared confused and muddled if the volume threshold was exceeded. Rapid flurries of notes from Thompson's guitar became blurred and lost their cogency. Notching back the volume control allowed the runs to regain their proper shape with notes better retaining their individuality.

Playing at its optimum level in my room the speaker seemed generally composed and extremely courteous. Its sound was easy on the ear and inviting. The metal-domed top end was fairly well detailed and always polite. The all-important midrange hadn't the scrupulous insight of more expensive designs - or of the less costly Epos ES11, designed like the Classic 20 by Robin Marshall - but this seemed to matter little: voices seemed articulate and were presented with rewarding naturalness. Many singers to whom I listened communicated effectively and drew me into their performances. The exquisite close harmony vocals on Crowded House's 'Fall at Your Feet' (from the WoodenFace CD), for example, were handled deftly. Each voice clearly retained its own character and 'space' despite some foreshortening of front-to-back depth in the sound-stage cast by the speakers.

### A Black Mark

However, when checked with a voice with which I'm very familiar, that of Mary Black, the Classic 20 fared less well. She appeared rather shut-in, her voice hesitant and unwilling to project clearly from within the inherently open, uncluttered mix. Neither did it exhibit its usual purity of tone nor its goose-bump raising properties. While the latter might be wholly subjective the former wasn't. On vocal pushes there was a 'quacky', colouration intruding suggesting that she was channelling her voice through her nose. At lower play-back levels this was less apparent.

Her recordings also highlighted some slackness in the bass that had not emerged so distinctly before. Garvan Gallagher's Clevinger upright bass

sounded fine on its upper strings and when he snapped the strings to mark the beginning of notes, but more gently plucked notes, especially on the low strings, were a little too diffuse for my tastes.

I wasn't satisfied with the Classic's rendition of tracks from the Hendrix Lifelines CD boxed set. The speaker sounded quite vital and clean but the music lacked substance and conviction. 'Manic Depression' seemed two-dimensional and much of its pin-you-to-the-wall impact was missing. Rhythmically it lacked the positive drive it has shown on other speakers.

I found the Classic's portrayal of classical music more satisfying. It seemed ultimately more persuasive here, even with demanding, avant-garde works like Varese's 'Ameriques', or Dave Heath's minimalist rhythm-based composition 'The Frontier'. Somehow it painted a more credible picture of orchestras than it did of rock ensembles. Dynamic

contrasts appeared more marked and realistic, and relieved of having to deal with swiftly moving bass lines the speaker allowed music to flow better with respect to time.

Essentially this seems to be a good looking speaker with a conservatively judged sonic balance. When it is run within its 'performance envelope', i.e., driven robustly by a sturdy amplifier, it can display animation and grace in equal proportions. It doesn't really come alive until it's driven reasonably hard but it loses its sobriety if you go too far. At its best it is composed and pleasant, and if that's what you're looking for it deserves a recommendation. In this respect it's not unlike Arcam's Delta 2. If, however, you prefer Rock to Classical music, crave visceral excitement and high replay levels you are probably best advised to look elsewhere... the more prosaic looking Epos ES11 for instance ●

### Measured Performance

In our recent review of five £200 (or thereabouts) loudspeakers I remarked upon the response tailoring used by Mordaunt Short in their 5.30 to get a particular sound - and here it is again. The Classic is very similar to the 5.30 I see by comparing their measured performance, except that treble output of the Classic is better maintained at very high frequencies - above 10kHz. This should add just a bit more zest at the top end.

So what is it that Mordaunt Short are trying to achieve? A characteristic sound that is smooth, easy on the ear, yet at the same time reasonably cohesive and revealing. The steady treble roll-off above 1kHz of the Classic is responsible for its civility, output falling steadily by about -3dB overall up to 8kHz, after which the treble unit tends to come alive again. However, whilst I can easily accept response tailoring of this type, since it gives buyers a subjectively pleasant option that might not be otherwise available, I'm a bit less certain about the vertical dispersion of this speaker. It produced the response shown in our analysis only at one on-axis position, right between the bass/mid-range unit and the tweeter. Listeners would have to get their ears at exactly the same height as a point mid-way between the drive units to experience this balance; move up or down much and a suck out appears in the frequency response, divorcing the treble unit from the bass/mid driver.

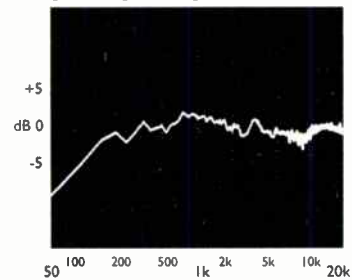
This effect is not uncommon in loudspeakers when the ear is a long way above the axis of the drivers, even though people like Mission and TDL and Heco (in this issue) demonstrate that it is possible to avoid such phase suckouts. Most loudspeakers I measure are a bit less critical about listening position than the Classics, giving listeners more leeway in seating height, so these speakers are intolerant in this respect.

The impulse response published here is detailed and accurate above 200Hz, but not below it. Additional measurements with pink noise showed output falls off quickly below 125Hz in free field conditions. The Classic must be used close to a rear wall, 8in being recommended, to bring up lower bass.

Sensitivity was mediocre at 84dB sound pressure level for one watt (2.8V) input. To go loud, the Classic will need an amplifier with a bit of power - I would suggest 50 watts minimum. Like most British loudspeakers though, it doesn't actually absorb power, because of its high impedance of 13ohms. This speaker actually needs the volts a powerful amplifier can develop to get it going. So the Classic is an easy speaker to drive in that it will not place a strain upon the power supply of a budget amplifier. The impedance curve we publish stays well above the 8 ohm horizontal centre line, demonstrating graphically the nature of the Classic as a load across the audio band.

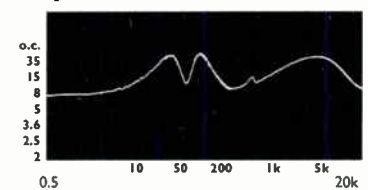
The Classic is very similar to other Mordaunt Short loudspeakers in its measured performance. It has been tailored to give a certain tonal balance, one that is easy on the ear. Being insensitive it needs a powerful amplifier to go loud. A speaker like this is likely to have strong appeal to some, but not all listeners I feel. **NK**

### Frequency Response



Mid-band prominence around 500Hz

### Impedance



High overall impedance



# animal magic

**Philips' new FA930 amplifier, designed for the digital age is a powerful beast. Eric Braithwaite turns up the volume.**

The 'Digital' sockets (upper left) simply transfer a digital signal from source to recorder. Note 'DCC' instead of 'Tape 2'!

I saw the new-style £199 Philips FA 930 amplifier along with about ten thousand other people at Philips' huge exhibition in London's Battersea Park at Easter. It's a marked departure from a bells-and-whistles style, Philips designers moving into charcoal grey - they call it 'graphite' - and uncluttered looks. The fascia contains six source indicators (which light up electric blue) on a perspex panel with bass, treble and balance control knobs below it, a contoured ledge at the bottom with seven further

switches and two large knobs either side, one for source selection and the other for volume.

This styling is common to the whole of the 900 series which includes all the major source components including - tantarrah! - DCC. Need I say that one of the seven source inputs is labelled 'DCC'? There's also room for ordinary tape, tuner, TV or auxiliary, tuner, Compact Disc and Phono. Disc input is Moving-Magnet only, which for reasons known only to themselves Philips refer to as 'MD', blithely ignoring any future confusion this might cause with Sony's MiniDisc. If you want to use a Dolby-Pro-logic or Surround-Sound processor there are sockets for that too, so you don't have to monopolise the tape loop. Two recording formats from rival manufacturers are ignored in the labeling: DAT and Minidisc. The future, as Philips keep telling us, is DCC . . .

Apart from the input sockets for the sources round the back, there are also two pairs of speaker terminals which, though plastic, are fairly chunky. They'll accept bare wire, but not the quarter-inch-thick kind. Nor will they accept banana plugs, although they appear to, except tangentially, which is awkward. This sort of thing is not only peculiar, it

becomes infuriating. Aren't proper binding posts used in Holland? Three other phono sockets accept leads which allow 'Intelligent' operation when other sources in the 900 series are connected. It's fairly bright, but not Einstein; press the right button on the remote and set the Philips CD player going, for example, and the amplifier will automatically select CD. Select tuner while a CD is playing and the CD player will stop without you having to walk over to it.

Normally I'd rail about this sort of thing, being a bit of a Puritan, and moan about people increasingly losing the use of their legs. Still, after an accident, I spent two years hobbling about with walking sticks, and it does occur to me that disabled people particularly would welcome this kind of facility. Very often, in the past, it's been provided as part of a midi-system type of set up where the sound quality of components was unequal at best and dire at worst - but you were stuck with all or nothing, because they wouldn't function apart.

A hand-held remote offers all the control functions for a Philips tuner, cassette deck, CD or even TV and VCR as well as the amplifier. If the only Philips component of the bunch is the amplifier, then volume, muting, source selection and switching of the amplifier to standby are all provided. Quite by accident - one never knows whether pointing someone else's remote at another's CD player might send it into a frenzy - I discovered that it made the Arcam Delta 170.3 I was using as a digital source do one or two Search and Play tricks Arcam don't mention. The instruction book - a multi-language one - manages to be both concise and clear. Except for one thing.

Counting up the input sockets at the





back I discovered some marked 'Digital Input'. These are a single co-axial for CD, and two pairs for DCC and a digital processor. Examining the manual, these come under the heading 'Digital Connections.' Oh aye, I thought, nobody said anything about an in-built Digital-to-Analogue converter. They didn't 'cos there isn't one. Effectively, these form a kind of tape loop so you can select a digital source, a digital recorder and then record the digital signal direct. To hear anything, the analogue outputs have to be connected to the amplifier as well. I now know that; so do you. Purchasers might not be able to fathom it out and wonder why, having taken the route with fewest interconnects, they are listening to the sound of silence.

Also round the back are three useful mains output sockets to save yards of cable tying itself in knots. Our sample had continental two-pin types, but it turned out that we'd been given a Euro-version. Production models for the U.K., Philips told me, are fitted with a Bulgin P772-type socket. This is effectively the same as the shielded IEC socket most British manufacturers use.

Philips' FA930 is certainly a powerful, loud, kind of animal. In fact it's an animal.

Push some brash brutal Rock through it and it comes out with serious damage potential. James was loud, fast, vivid, and loud. Prince's Diamonds and Pearls was very tight, very clear, very concise with some heavily rolling thunder and fast, though somewhat lean bass - and loud. It's quite stunning, in fact, this Philips, with an appearance of real shove and an ability to put the boot well in.

Partly this is emphasised by a very good, clear, clean mid-range, squeaky-clean treble and bass without added bloom. With a sharp central focus, so that Prince was right between the speakers, this adds to the impression of detail and vividness. Listening to some solo lute music at exactly the opposite end of the spectrum, I was as impressed by the cleanliness of details like Nigel North's fingering and occasional sniffs as I had been by the slash of cymbals on the James Seven CD, the snuffle of brushed cymbals on a jazz recording, or the sharp handclaps and shouts of the players at the beginning of De Falla's Three cornered Hat.

Though there is a splendid, unexaggerated clarity, the FA930 can fall over itself a little with complex textures, either on orchestral or rock music.

## "Need I say that one of the seven source inputs is labelled 'DCC'?"

### Measured Performance

There's plenty of punch behind the new FA-930 - it produces no less than 98watts into a normal loudspeaker load. That's enough to make any speaker go loud. Low loads like the Heco Allegro 350s tested in this issue will draw even more power - 144watts. So this amplifier has all the muscle its size suggests it should possess. Although Philips say it delivers more peak than continuous power, curiously I found little difference between the two.

From a company like Philips I expected low measured distortion and this proved to be the case. Levels hovered around 0.004% at normal outputs and never rose above 0.03% under the most extreme conditions, namely high output at high frequencies. The analysis shows that just a small amount of second and third harmonics were produced. These are reasonably innocuous subjectively.

I criticised the predecessor to this model, the FA-890, for its excessive input capacitance on phono. It upset frequency response, making the disc input give an unusual presentation of what a moving magnet cartridge was doing. This problem has been cured, Philips told us - something that measurement confirmed. The disc stage worked well in all areas.

This is more an amplifier for the digital age. The CD input has wide bandwidth, the high frequency limit being arguably a bit excessive at 81kHz. Signals above 21kHz are strictly unwanted from CD and allowing response to continue upward quite often seems to result in bright but hard or grainy treble.

There was little noise and good sensitivity on the unequalised outputs - enough

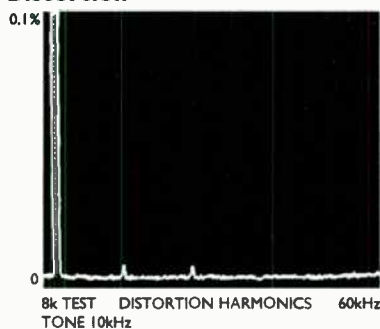
to cope with low output cassette decks and tuners.

The FA930 is a sturdy powerhouse with lots of inputs - but it is not a "digital" amplifier, in spite of digital inputs, we must note. There is no on-board converter. **NK**

<b>Power</b>	<b>98watts</b>
<b>CD/tuner/aux.</b>	
Frequency response	11Hz-81kHz
Separation	56dB
Noise	-98dB
Distortion	0.004%
Sensitivity	180mV
dc offset	-82/-85mV

<b>Disc</b>	
Frequency response	40Hz-85kHz
Separation	56dB
Noise	-78dB
Distortion	0.005%
Sensitivity	2.6mV
Overload	125mV

### Distortion



Tonal qualities are pretty good; speed and pace extremely good; but the spine-tingling sharpness of focus in the centre does become a little faded towards the outer edges, making pan-potted Left-Right swoops of guitar a bit perfunctory. Depth also is not one of this amplifier's strong points. It paints a brightly coloured mural, but one that is a little two-dimensional.

### Phono Promise

To my relief, this goes for the phono stage too. A little woollier and a little less clean than the line inputs, and failing to deliver the full range of tonal colour and dynamics that my Koetsu Black is capable of (through a head amp, of course), nonetheless it stands up well alongside the line inputs. It's not a cheapskate knock-down affair put in to connect up a cheap plastic turntable and five quid cartridge.

All this puts the FA930, in sound terms, somewhere between the lean, but detailed Arcam Alpha 3 and the big, big sounding Pioneer A400. The only disadvantage is that it is more stressed by higher-grade sources than would normally partner it at this level, and couldn't really pass on everything my partnering equipment could transmit to it. Digitally speaking, smooth budget Bitstream sources would complement it well, easing some of the tendency to hardness and spreading its virtues a little further. With a remote that does everything, the 900 system of which this is the founding member could well be one to watch for ●

"a combination of delicacy, force, and enough verve to bop to"

**B**udget low-bit players have acquired a justified reputation for erring on the side of blandness. Not so this one. I don't know precisely what Sony have done, but with the new CDP-497 they haven't simply put last year's machine into a slimmer lighter package, bunged in a few extras and

knocked a few quid off to keep it under £200 and buoyant in a turbulent market. For a relatively cheap machine, priced at £184, this one sounds pretty good I found.

There is a big market out there still to be captured - not every home yet has a CD player. It's the sub-£200 market where the next battle is to be joined; something like three-quarters of all player sales are in this price-bracket. Not having been too keen on the sound quality of the previous Sony at this level, I was beginning to take a cynical view: gadgets galore, functions "ten", sound quality "one". But it looks like the situation might have changed.

The new CDP-497 is light, though. God's good fresh air costs nothing, and it feels as though there's no lack of it inside. While we're thinking of air and therefore breathing, a flute player in a 20-bit Jazz recording had just the right amount of it. So did a solo trumpeter. This was near-ideal, it's a key to a degree of detail and insight all too often lacking from cheaper players.

Acoustic instruments and solos, in fact, came across extremely well, with

# SOUND SONY

**One of Sony's new range of Compact Disc players, the Sony CDP-497 may be low in price but high in value, thinks Eric Braithwaite.**

## Measured Performance

Much as expected, the CDP-497 measured all but perfectly. There was no surprise in this: Sony long ago conquered the difficulties of getting a superb measured performance from CD even though, to be frank, few believe they have had equal success in getting a similar level of sound quality.

I mention this because of the understandable confusion that arises amongst many people over the apparent contradiction between a 'perfect' measured performance and a lesser subjective rating. The solution to this is simple: we don't and can't measure all we should be measuring and, in any case, relationships between measured performance and sound quality have never - and probably will never - be unequivocally established. The tenuous links we use are based not on published research, because little is available, but upon our own experiences. Hi-Fi World is the only UK hi-fi magazine with both test equipment and a listening room in-situ.

Frequency response is of known subjective impact. It largely determines tonal balance: whether something sounds bright, dull or natural in balance of treble to bass. The CDP-497 gets this absolutely right, as the ruler flat line on the response analysis shows.

Distortion at low levels just tinges the sound, adding character rather than overt roughness. The Sony has as little as it is currently possible to have - and I would hesitate to state that the small amount I could measure at very low levels would be

of much subjective consequence. At ordinary music levels, our analyser saw only low level noise, as the analysis shows. This means that distortion was less than 0.004%, which is to say it was subjectively inconsequential.

Separation between the stereo channels was extremely good - more than adequate. There was little output of unwanted signals above 21kHz. This is an area where budget players used to look poor, but not the Sony.

If there is an area where measurement seems unable to provide any enlightenment, it is in general dynamics. This is wrapped up in time domain behaviour under varying signal conditions, an area that steady state, monotone measurement fails to address. At present, listening tests are the best way of reaching a final conclusion.

I can say, however, that using a reasonable range of conventional measurements, Sony's CDP-497 has no obvious weaknesses. This isn't to say "it is perfect", other than within the standard parameters

measured for this review. But it does suggest that, at worst, the player will sound basically competent. At best, we might hope it will rise to some small stardom in its own little niche. **NK**

## Test Results

Frequency response 4Hz-21.3kHz

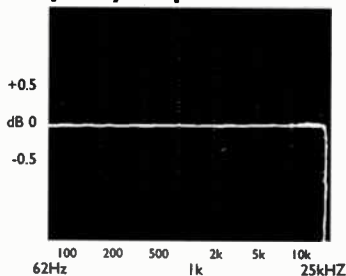
Distortion	0.005	0.005
-6dB	0.005	0.005
-30dB	0.004	0.004
-60dB	0.4	0.4
-90	30	30
-90dB dithered	0.6	0.6

Separation	left	right
1kHz	110	110
10kHz	84	84

Noise	-126dB
with emphasis	-128dB

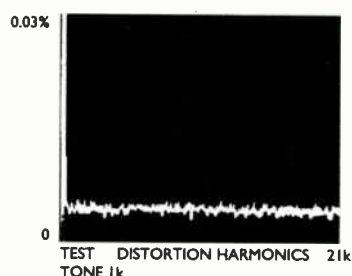
Dynamic range	110dB
Output	2V

## Frequency Response



Ruler flat frequency response

## Distortion



No measurable distortion





a combination of delicacy, force, and enough verve to bop to. Finally, budget low-bit seems to have come of age and begun to go low. Prince's admittedly somewhat artificially equalised bass on Diamonds and Pearls was tight and hard-hitting. Sony's CDP-497 made a party of this - and other rock recordings. Admittedly, the studio mix was evened out across the stage, and there is more detail in the mix than came across, but it was definitely fun.

Some smoothing over the edges was also noticeable on Lou Reed's Magic and Loss, where there is more air and space, plus instruments and vocalists better separated than the Sony could manage, but it portrayed a neat, tidy and, above all, enjoyable performance.

The same was true of classical pieces. Castenets, yells and the initial blare of brass in Dutoit's Three Corned Hat recording were brilliantly clear, though orchestral tone when it came to the full orchestra was a trifle lacking in multiple shades of colour. It's an odd thing, but low-bit tends for some reason to diminish natural reverberation, bringing a subtly deep recording like this into more of a flat plane between the speakers - and the '497 didn't perform exceptionally in this respect. Perspective, however,

was pleasantly credible, though not as sharp as the architectural drawing of much more expensive models.

By and large, this is a poised and elegant player. A couple of quibbles: on a 20-bit piano recording from Sony Classical, some of the left hand was a little woolly, something which moderated the impact of kick-drums, too. All the same, given a little smearing of solo images, there's no doubt the '497 can come up with a lively and sure-footed sound when it has to, not generally over-taxed.

### Kitchen Sink

And apart from the sound? I couldn't spot the kitchen sink, but there's nearly everything else. A fair number of the push buttons - tiny enough for dwarves but a bit small for the ham-fisted - relate to the now usual home-taping-made-simple lark an increasing number of Far Eastern CD players are becoming equipped - not to say overpopulated - with.

There's Custom Edit, which sorts out a playing time to fit a tape; the player can fade out the last track for the end of the tape even. Should you, for some reason, want to do this when you're listening, you can. The inevitable Peak Search function finds the loudest bit to set recording level to; you can insert three-second spaces

between tracks when you're recording for those decks that have a music search function. A neat idea is Auto Cue which eliminates the blank lead-in section before the music starts.

More? Well, there's Music Scan, which plays a few seconds of each track; Shuffle and Repeat, Programming of up to 24 tracks and the basic control functions as well. One slight oddity which momentarily confused me is that programming over twelve selections utilises a 'Plus 12' button instead of a 'Plus 10'. It's 'Plus 10' on the remote, though. The remote control, by the way, handles all the functions, including volume if the variable-output sockets at the back are used instead of the fixed-output. There is no digital output, so add-on DAC's are out. The display is somewhat on the small side, but bright and legible; my favourite calendar-style track display is over on the right, too.

All this, and a more than decent sound quality for the price adds up to something of a bargain for the dedicated gadgeteer and copying addict. It's not bargain basement high-end, not quite subtle enough or transparent enough to take on CD players at a hundred or so more, but the CDP-497 represents a distinct, worthwhile, sonic step-up from previous Sony players ●

"there's no doubt the '497 can come up with a lively and sure-footed sound when it has to"

**AMPLIFIERS AND PRE-AMPS**

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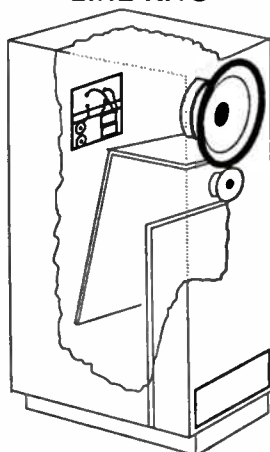
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Scan-Tech, the Japanese cartridge manufacturer behind the Grecian-sounding Lyra marque, have long been connected with superb high-end cartridges. The £549 Lydian imported by Path Premier is the latest.

In the past, Scan-Tech have been involved with the well-respected Spectral cartridges in the United States. Today, they produce the generators for a number of well-loved cartridges, such as the Morch da Capo and the American cable manufacturer AudioQuest's high-end AQ-7000.

Now their own range of cartridges have been causing a stir. The first, the Clavis, redefined musicality in a cartridge, albeit with a substantial price tag. Next came the Pamassus; even more expensive than the Clavis, it leaves a profound impression upon those who have heard it. Until the arrival of the Lydian, however, these cartridges have been out of reach of all but the most bulging of wallets.

The Lydian has been a long time coming. Although the dark-green-bodied cartridge was spoken about over a year ago Scan-Tech have spent many months refining and honing the Lydian.

Ostensibly, there is little new about the design, but the art lies in application more than innovation. It is a low impedance moving coil design using an iron core and a square armature. The boron cantilever is partnered with a line-contact stylus, which tracks at around 1.8g - 2.0g. The coils have been wound with as few turns as possible, in a similar manner to the Audio Note Io, and this is said to give the Lydian its supremely fast transient attack.

Scan-Tech designers suggest that the cartridge is best used into an amplifier's moving magnet input, with gain turned up. The output of the cartridge, at 0.3mV, is low. I would prefer to use it with a moving coil input or a good MC transformer like EAR's The Head.

An unusual feature of the Lyra range is the ability to remove the cartridge body, leaving the nude generator exposed. This is a delicate operation to perform, one that requires a steady hand and a keen eye, lest a fatal mistake is made. In the accompanying instruction sheet, Scan-Tech note this possibility but do not recommend it, simply because a mistake will trash the cartridge.

On the other hand, if you are feeling bold, remove that body as soon as possible, as it turns a superb sub-£600 cartridge into an awesome one. Off comes the body and out comes music that you never believed possible. Fully clothed, the Lydian is lyrical and liquid; when naked, add the word lovely to the list of alliteratives.

Hi-fi writing has its own language, a vocabulary that attempts to portray music in written terms. The Lydian is one of those rare beasts that defy language, it has such a

supremely musical performance.

The literature describes the Lydian as having an absence of character in its sound. This is only partially true. It doesn't have the glorious absence of colouration, or the 'disappearing' midrange of the Dynavector XX-1L or the Ortofon MC-3000, although when disrobed, the Lydian comes admirably close. What it does have - something I have never heard before - is the ability to mould itself to the music in the groove.

I admire neutral products as they favour all types of music equally, from the most

and Troika cartridges. This may explain its success in the Aro arm, optimised for them. It is true that the Lydian does not stress that stark neutrality associated with the sound of the Pink, but its magically adaptive character fits the turntable as well as the music.

We could talk about the speed of its attack of the cartridge, or of its ability to cope with complex timing changes and rhythms, but such things are specious with one of this quality. With the body in place, there is a slight resonance to some mid-band frequencies: Al Green's voice, for example, takes on the merest hint of chestiness. Take the body off and Al Green has been at the Fisherman's Friends; his chest complaint disappears.

Although the Morch Da Capo and the Lyra Lydian are from the same family, with a similar sound, the Lydian's musical magic sets it a fraction ahead. Both are superb cartridges, that stand toe-to-toe when the Lydian's body is fitted. Once the body is off, the two are not in the same class - the Lydian's musical transparency sets it above the already excellent Da Capo.

I have not had a chance to spend time with the more expensive Lyra cartridges, but I have been reliably informed



## Lyricism

**Lyra have caused a stir with their high-end cartridges; now the more affordable Lydian makes magic for Alan Sircom.**

delicate and subtle Gregorian chant, through to the most raucous heavy metal. There are products that can enhance specific types of music, which is why they are classed as ideal for Rock or alternatively, for Classical.

What is strange about the Lydian, naked or not, is that it sounds like an ideal 'Rock' cartridge for a Rock record, or an ideal 'Classical' cartridge for a Classical record.

Playing a record with a strong dance beat, the music gets funky, fast and upbeat, turning a well-balanced system into a disco or a P.A. Put on a jazz track and the system sounds like a club, smoke and all. Move over to Classical records and the system changes yet again, becoming romantic, dramatic, intellectual or moving, again depending on the music.

All its hi-fi characteristics are exemplary: imagery, dynamic range, coherence, timing - everything. No part of its performance was ever at fault, apart from a minor quibble, described below. It was suggested that the Linn Sondek, with a Naim Aro unipivot tonearm, would suit the Lydian better than my Pink Triangle Anniversary with SME V. Visually at least, the Lydian appears to have a similar overhang to the Linn Asaka, Karma

there are serious improvements to be had by going from Lydian up to Clavis and then to Pamassus.

Elsewhere in this issue I have described the neutrality of the Denon DL-304 cartridge that makes it a bargain at its £200 price tag. What sets the Lydian far beyond the Denon is near indescribable; it instils a sense of vibrancy and performance into any recording that it graces.

The only cartridges that I have heard that can prove a match for the Lydian are the Audionote Io, the now defunct Highphonic MC-A3 and the Technics EPC-205 moving magnet cartridge. All of these are considered to be legends among the cognoscenti. There is usually a massive quality drop between these and mere mortal styli - but not with the Lydian.

Just when Compact Disc moves into its position of dominance, along comes the Lyra to show what the good old turntable is capable of. It is difficult to explain such a musical performance without recourse to hyperbole, but although expensive, the Lydian must represent the first step toward vinyl Nirvana in cartridges. All else is mere gaslight ●



## kelly's corner

A paint-stained Richard Kelly hands over the completed IPL S3 loudspeaker kit to Noel Keywood to put it through its paces.

The completed speaker and stand in bare wood at right, alongside Richard's final red Hammerite version. It was less shiny and metallic looking than he had hoped, but painting was more in line with his talents than getting tangled up with self-stick veneer.

Kelly demonstrates his delicate application technique in the inset shot. Hi-Fi World now has a red Hammerite garden path, red Hammerite grass and even red Hammerite flies.

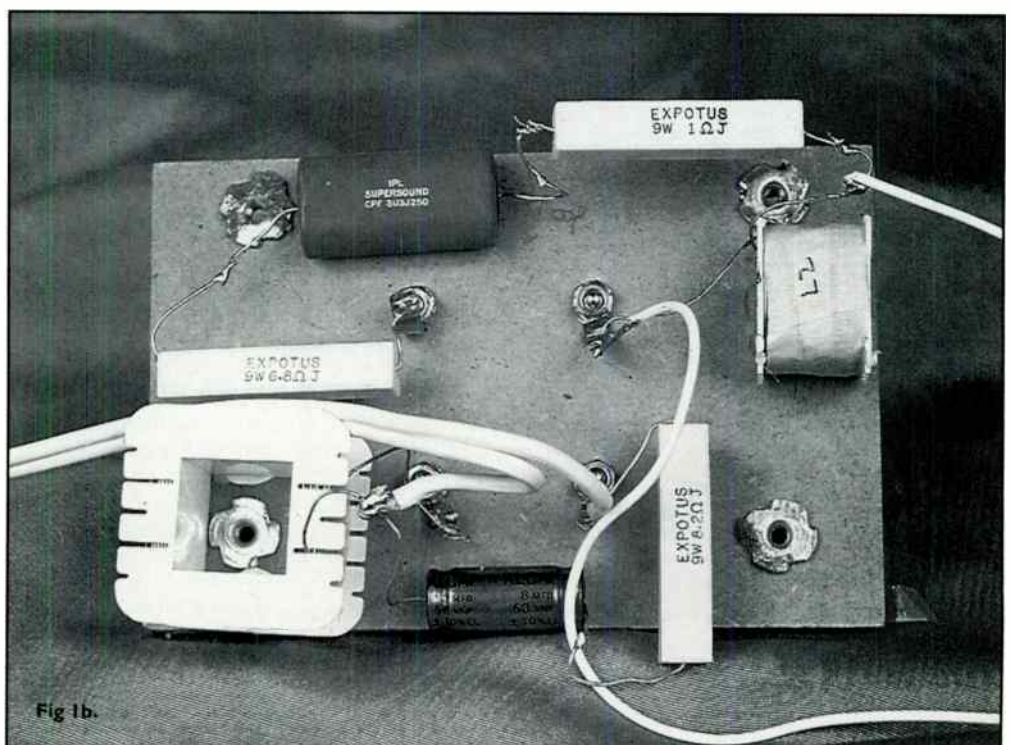
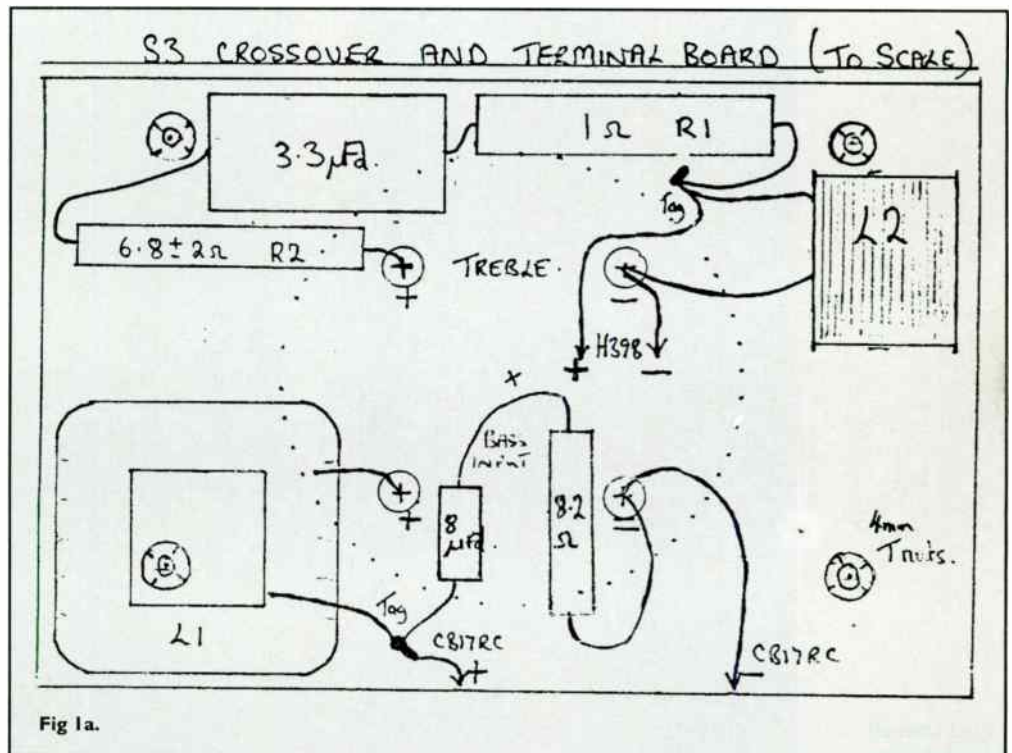
# Last Lines on the Transmission Line

Last month we described what this kit claims to offer and the problems in building it. Just to recap, a 'transmission line' loudspeaker like the S3 is supposed to give good, deep bass from a reasonably sized - but internally complex - cabinet. Since this increases the build cost, making commercial versions rare, kit building should be especially advantageous.

But is it? Does the S3 work well or not? Is it good value for around £220 all-in? This month we checked over Richard Kelly's handiwork then got down to the serious business of measuring, tweaking and listening to this kit speaker.

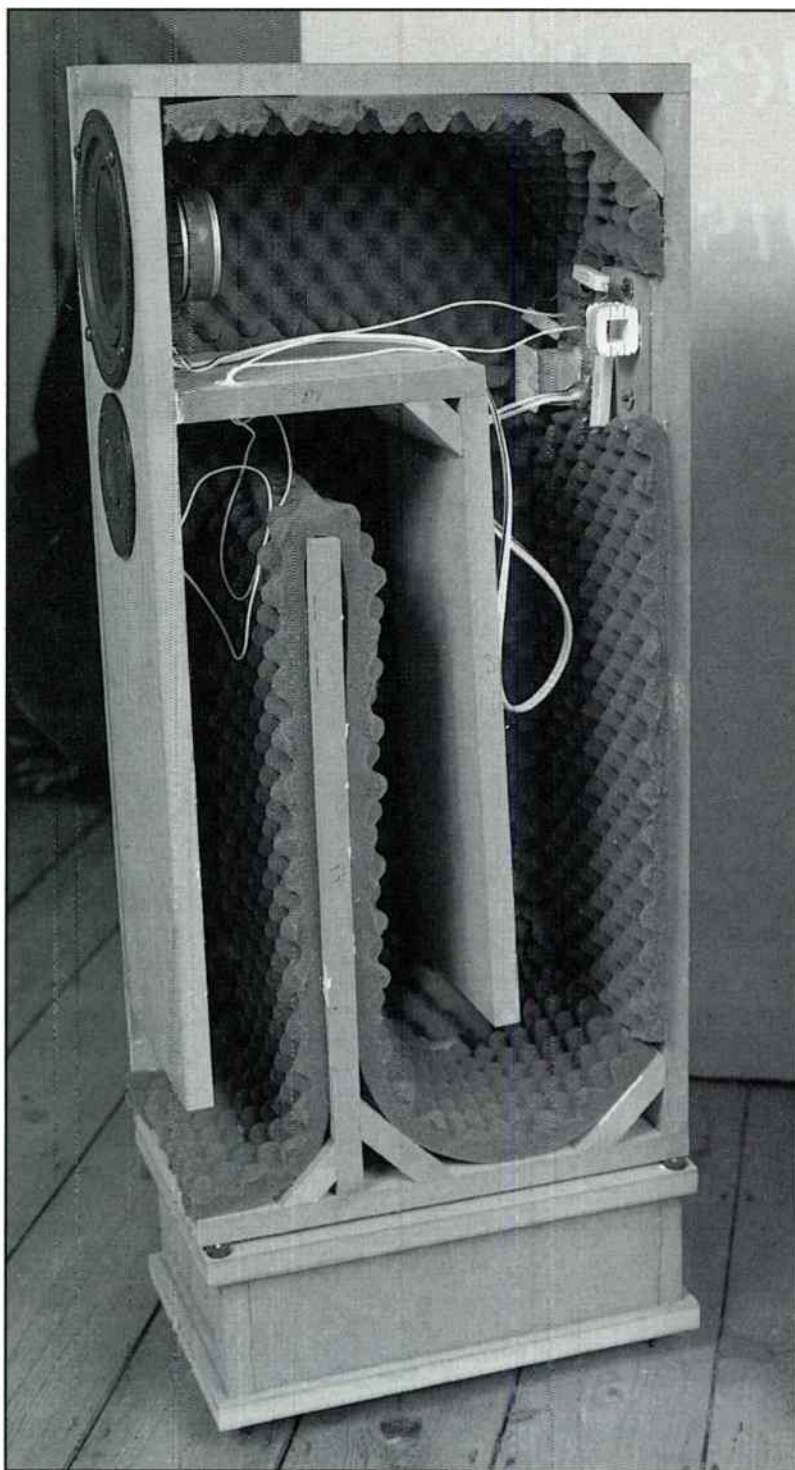
**W**e ended last month having physically built the loudspeaker, but no more. Confident of Kelly's handiwork and with the final battle over finish - veneer or paint - being postponed until all other matters had been attended to, the S3s were wheeled into the lab.

The first test revealed immediately that something was seriously amiss. As a matter of course, the crossovers were checked for roll-off rates and frequencies, to see that they reasonably accorded with the manufacturer's claims. Having spent much time on crossover design in the past, I know this is crucial. Our Hewlett Packard 3561A spectrum analyser performs this task with a speed, precision and breadth of analysis unmatched by other methods; it is an invaluable tool for loudspeaker work, making comprehensive investigation



**Fig 1a** The only diagram of the crossover is this component schematic, where **TREBLE** and **BASS** refer to the input terminals, not the drive unit connections.

**Fig 1b** The crossover is built on a piece of MDF, to which the main electrical components are glued to resist vibration. They are then soldered together. The method is cheap, simple yet effective.



**Fig 3 Internal view of the transmission line, with acoustic foam installed. Note how the port opens at bottom front.**

practicable. I was thankful for it here.

Expecting to see the curves shown in Fig 2, which display output of the low-pass (to bass unit) and high-pass (to treble unit) sections, straight lines appeared on the screen. Kelly started to shuffle his feet uneasily beside me; the analyser's message was clear and unequivocal; it said: "balls up!".

Engineers might easily laugh and scoff, but really the fault was understandable. Knowing nothing about circuits and being confronted by a hand drawn mechanical diagram of component layout in the crossover, which I found initially difficult to interpret too, Richard had soldered the wires from the drivers straight to the points labelled 'Treble' and 'Bass'. These were the input terminals, so the crossover had been bypassed in effect. Richard believed the crossover did its work by just being connected across the terminals;

it takes prior knowledge to understand that the crossover comes between amplifier and drive unit. And in case this seems obvious I would suggest it isn't; parallel connection of a network can work if preceded by a high output impedance.

#### Wiring and Re-wiring

The mistake simply highlighted the potentially ambiguous and confusing nature of the instructions relating to the most difficult part of the kit, at least for anyone having no knowledge of electronics. My suggestion here would be that the drive units are pictorially represented in the diagram (see Fig 1a), the connection route made more prominent and the input terminals more clearly labelled as such.

We rewired and checked drive unit polarities carefully, since this is another

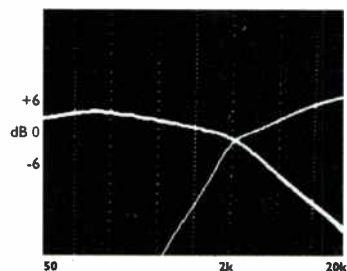
area where it is easy to make a mistake. I noticed that the roll-out rate for the bass unit on one crossover was higher than that of the other, but the treble sections were identically matched between the two speakers. We checked the 8.2 ohm resistors but they were identical; differences probably lay in coil or drive unit resistance variation.

No matter, frequency response is the final arbiter of performance and other factors would - and did - play their part. I am thinking mainly of sample variation between the drive units themselves. One speaker had a bit more output (around +1dB or so) around 5kHz when we measured the frequency response of both later. I suspect tweeter variation. The difference would be barely noticeable in use however.

#### Tweaking Treble

The crossover is reasonably complex and works well. IPL claim the bass unit low-pass rolls out high frequencies at -6dB/octave and the treble high pass rolls out bass at -12dB/octave. Our analysis in Fig 2 confirms these claims. Treble level can be tweaked to taste by altering the 6.8ohm resistor, but this value resulted in a satisfactory response balance when listening on the axis of the drive units. We noted a very slightly subdued or 'polite' overall treble energy balance when listening to the S3 and felt this was desirable. Our pink noise response analysis in Fig 5, plus other analyses made whilst testing, show that treble was

#### Crossover characteristics



**Fig 2 The spectrum analysis revealing crossover performance shows -6dB (first order) low pass to the bass unit and -12dB (second order) high pass to the treble unit, the changeover 'knee' being 2kHz.**

measurably down, but by the smallest amount (-1dB or so).

Frequency response of the IPL S3 on its own (i.e. free field), without floor reinforcement of bass which it must and will have in practice, is shown in Fig 4. This is an on-axis, high resolution impulse response which gives a clear picture of smoothness of the drive units, nature of suck-outs, treble extension, overall balance and, not shown, dispersion.

The measuring microphone showed that listening much above the bass/mid-range drive unit axis, phase cancellation between the drive units appeared. This subjectively reduces detail and coherence by putting in a suck-out at the crossover frequency, around 2kHz. A small dip can be seen in this region in Fig 4, where the output of the two drive units meets. The S3 is best raised up on stands if necessary, so that the drivers are approxi-

mately at ear height, a situation that gives the smoothest and most cohesive sound in use.

The impulse response doesn't portray low frequency behaviour clearly or accurately. This has to be assessed using a pink noise test signal and third octave analysis. The outcome is interesting and accorded well with what we heard. Placed on its stand, the S3 gave the frequency response shown in Fig 5.

This is very similar to the impulse response, as it should be, except at low frequencies where it gives a truer picture. Floor reinforcement of bass output from the port is taken into account here, and it results in a frequency response that runs smoothly from 12kHz right down to 63Hz, but for a noticeable -5dB dip around 150Hz. Bass output is -3dB down at 50Hz but the port radiates well down to 30Hz, measurement revealed. The contribution from the port can be seen here, even at 30Hz (-10dB), meaning the S3 does give good low bass, a bit lower than that from smaller boxes. In listening tests we could hear this clearly; the S3 does deliver real low end power. Subjectively, it goes lower than most commercial reflex or infinite baffle loudspeakers. Deep organ notes sound real and quite frightening for example.

Listening tests also showed us that, if anything, the S3 is a bit bass heavy and, whilst it has low bass power, there was some reluctance to play a bass tune well. Richard said he felt it had monotonic bass. The reason for this lies partially in that dip around 150Hz that our pink noise analysis reveals. This is due to port cancellation of forward radiation from the bass/mid-range driver; the port peaks strongly around 125Hz, suppressing upper bass harmonics that pitch-define notes and give the feeling of controlled and defined bass playing.

My favourite test of this, a rigorous one not handled well by many commercial loudspeakers I should add, is the Tina Turner track Break Every Rule. If the introductory bass line doesn't have speed, clear note definition and low-end power from fundamentals, then the speaker is fluffing it. Most get into an awful flap over this track. Fundamentals commonly set the bass unit/box booming, due to poor damping, so the notes run into each other, forming an acoustic mess akin to the sound of an over-excited and confused Marshmallow; harmonics get selectively emphasised so the tune is

corrupted, as if the bass player is dropping notes; or in the case of the S3 (a rare one) a suckout undermines the track's musical intent, if not its fundamental power, by weakening the instrument's higher notes and harmonics.

### Damping and Dr Bailey

With the S3 we found some useful improvement was to be had by inserting some damping material in the tunnel. We had hoped this would provide a complete solution by attenuating high frequencies radiated by the port more than low ones, so lessening the suckout, but without attenuating deep bass. Unfortunately, our hopes weren't fulfilled. The suckout was lessened, but so was overall bass level. The differences we heard in sound quality with pink noise proved the effect upon bass quality the damping was having - and it proved very interesting. BAF wadding was tried first, in the port, further up the tunnel and finally in the chamber behind the driver. Bass level could be brought down OK, so it works, but not we found, as effectively as long haired wool. As noted by a certain Dr Bailey many years ago, this really is an effective damping material, much more so than BAF wadding.

After yet more experiments we found the ideal balance was achieved by using just a light, teased-out amount to occupy the space in the chamber behind the bass driver, plus a little more right in the mouth of the port (but none in the tunnel). We used remarkably little to get noticeably improved bass damping, without serious loss of bass power. The S3s lost their fullness and plumpiness at very low frequencies, becoming usefully drier sounding and more controlled. Now, in listening tests, we found they played a bass tune with far better control and timing, yet there was still plenty of power. The progressive descent of notes from an organ, right down through room shaking fundamentals, was handled with a great sense of ease and evenness. One of the classic strengths of a transmission line is - or should be - its ability to reproduce notes with alacrity irrespective of their frequency and in this the S3s excelled. So they do fulfil the promise of good, even and well extended bass.

Other important parameters of the S3 measured well. It has a high overall impedance of 11 ohms, making it easy to drive. The impedance curve (Fig 6) shows little variation across the audio band,

indicating that this is a resistive, not a reactive load, meaning it is easier to drive than most loudspeakers. One minor drawback was a low sensitivity of 83dB sound pressure level for one watt output (2.8V), meaning a powerful amplifier is needed for high volume. I would suggest around 100 watts would be ideal, used sensibly. We found the S3 went very loud without sounding confused or strained, something I thought was pretty impressive (drive amp: Musical Fidelity SA-470, 350watts per channel). DIY headbangers step this way; the IPL S3 will go loud enough to scramble brain cells. (Kelly insisted on this test, 'cos he plays at levels that have me exiting the room at high speed.)

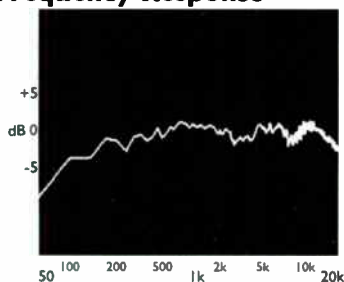
With the crossover as standard we found the S3s sounded remarkably smooth and civilised. They are free of peaks in the treble and the smooth reproduction of bass notes I have already described contributes to a fine overall sense of balance. We felt the tweeter was good, if a little prone to hardness. This was confirmed when the 1ohm resistor was bypassed in each crossover to bring treble up by about 1.5dB. A small amount of rasp then became apparent and even though it accompanied slightly better projection of vocals we felt that it did little to improve smoothness or balance, so the crossovers were returned to standard.

A Rotel RB-960BX power amplifier was also tried, being a more realistic match in terms of price than our own SA-470. It was less dynamic, coarser and brighter, again suggesting that in practice the S3s are likely to sound best as standard.

### Impress Your Friends

Biwiring improved the sense of cohesion and subtly cleared the sound of some muddle. However, whatever we played, the S3s stayed clean, smooth and uncoloured. As promised, they deliver deep, even sounding bass of impressive quality. These are speakers that will impress your friends and have the room shaking with oodles of bass if you so desire. They're not ideal for beginners in DIY and there are some difficulties to be overcome in building them. Our conclusion was that they offer good value all the same and they should provide hours of happy experimentation for those who want to be in control of the final result ●

### Frequency Response



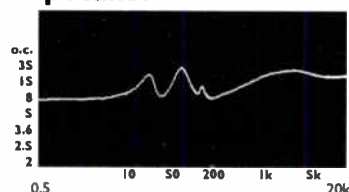
**Fig 4** Impulse frequency response of the IPL S3 compares very well with commercial loudspeakers. It is relatively flat and peak free right across the audio band, giving a tonally even, smooth sound.

### Frequency Response

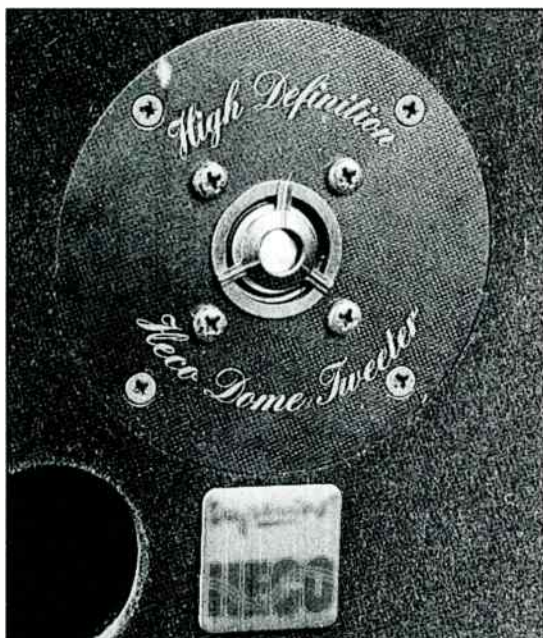


**Fig 5** The third-octave frequency response is similar to the impulse response, except at low frequencies where it is more accurate and detailed. The cancellation suckout at 150Hz is clearly visible, plus output maintained down to 30Hz.

### Impedance



**Fig 6** An unusually flat impedance curve with eight ohms a minimum value makes this an easy speaker to drive, but a bit insensitive (83dB Sound Pressure Level for 1 nominal watt of input).



No, it's not baby-talk. It's because the manual that arrived with this pair of Heco Allegro speakers is a wonderful example of Germlish. This is a kind of German Japlish, that off-side mix of wrong words, or what happens when a bug gets into one of those little pocket translating machines.

**F**aced with a pair of £350 "concpated" speakers I momentarily wondered what a dose of Ex-lax might do; I struggled with the notion of "suitable pedests or underframes." Not being able to lay my hands on either a pedest or an underframe I made do with Target stands instead.

Heco's Allegro 350 is a three-way ported design, with the tweeter centrally mounted. The theory propounded in the booklet, as far as I

could make out after struggling through the language barrier, is that the human ear is most sensitive to the 300Hz to 3kHz region, so one of the polypropylene-coned "concpated" mid-bass units operates over this region, the other handling the lower frequencies and the aluminium-domed tweeter the higher. According to a diagram, the listener is expected to sit with ears higher than the tweeter.

Our pair arrived finished in black. Cabinet design would make some Brits pause for thought; the sides project forward from the baffle so the cloth-covered grille fits flush. I won't criticise this in itself as a design flaw, though British designers avoid it. Interestingly, the baffle is covered in a flock material on the grounds that it absorbs some unwanted reflections. Biwiring or bi-amping the Allegros is an option: two pairs of fairly standard binding posts are fitted at the back.

Single-wired, if "concpated" is read as "constipated", that would be about right. Dynamics and dynamism simply

# Podest Peaker

**If the Heco Allegro 350 loudspeakers are representative of German taste, Eric Braithwaite reckons he'll just take the Sauerkraut.**

## Measured Performance

Many times I have heard - as a casual observation - that the German loudspeaker buyer demands lots of bass and treble. Somehow, I have never quite believed it. Measurement and objectivity were and are notions strong in a country acknowledged to be skilful in its engineering. Yet recently, both Dutch Philips loudspeaker engineers and Danish Dynaudio loudspeaker engineers have been at pains to point out that their loudspeakers have moved away from this type of presentation to what they describe as a "British sound". I put this down more to greater attention to measured performance within European loudspeaker manufacturers than to any conscious change in outlook that could be associated with one country or another. It seems I was wrong.

Frequency response of the Superior Allegro 350 from Heco of Germany made me wince a bit. But it's a personal problem, you see. I cannot listen to loudspeakers or CD players, or much else, with rising treble output - and the Allegro 350s have strongly rising treble. In fact, a third-octave analysis of frequency response (not shown here) showed they have a bass peak too. So the 350s have loudness compensation built in, as it were.

I said it was 'personal' not just for jest. Heco have simply engineered their loudspeaker to satisfy a certain taste. In this, they really are little different from Mordaunt Short, for example, whose Classic 20 loudspeaker errs in the opposite direction. Ideally, to be accurate, loudspeakers should have a flatter frequency response than ei-

ther. However, since even flat response loudspeakers all sound different - and some don't sound especially neutral - even if they measure that way - I tend toward pragmatism these days. The Allegro 350 isn't flat and there's no doubt that its strong treble lift of +5dB at 20kHz will be audible to those with reasonably acute hearing. All the same, some listeners may like it, or even need it - should they be suffering high frequency hearing loss.

There's a +3dB bass peak at 125Hz, which suggests this speaker will provide strong or perhaps boomy bass. Yet Heco recommend shelf mounting, which puts the speaker against a rear wall, a position that increases bass even further. Never mind, the instructions are sufficient compensation. They say that the 350 (and 250) are "concpated as shelf speakers and especially develop their homogene and neutral sound at particular places, in shelves, on suitable pedests or underframes." No wonder they don't work in Britain: rooms just don't understand them.

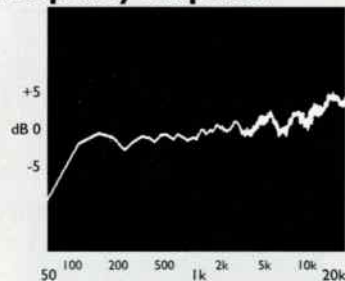
Vertical dispersion was unusually wide, giving a similar sound balance even when listening well off the axis of the drive units. I had hoped that treble might fall away off axis, but in this case good engineering worked against the product.

The 350s are enormously sensitive: they develop no less than 88dB sound pressure level for one nominal watt input (2.8V). At any volume setting, they will be louder than most rivals. The reason for this was their unusually low impedance. Overall, it measured 4.6ohms. However, as our analysis shows, minimum impedance was 2.5ohms. The Allegro's will draw current. Most good

hi-fi amplifiers will cope, but expect differences between models to be highlighted, since they have to work harder with a speaker like this.

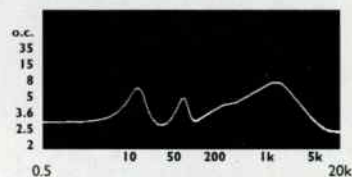
The Allegro 350 has been deliberately engineered to have emphasised bass and treble, something that appeals to the German market I am told. It has not been modified for British tastes, but some listeners may favour it all the same. This speaker is also a difficult load for an amplifier. Measurement suggests this is a speaker best listened to carefully before intended purchase. **NK**

## Frequency Response



Strong treble lift above 1kHz

## Impedance



Low impedance of 4 ohms nominal



failed to come across. Even The Cult's furious, hard-driven mixes failed to rouse enthusiasm, with, seemingly, half the band taking leave of absence. Bach's 'Jauchzet Frohlocket', to go completely to the other extreme, mystified me for similar reasons: the entire chorus seemed to be composed of the same voices, and there are more than just grilles and tenors in there. With no bass, muddled the Allegros, indistinct vocals, indistinct

Honest, I didn't get out of bed on the wrong side. Nor did I have one of those letters from the bank manager. I was in a far sunnier mood than the Heco Allegros could match. I ended up simply at a loss, trying to find some recording somewhere which didn't need dynamic range, didn't have instruments - or vocals - that covered more than a few notes on the staff, and preferably not very far apart either. If you have a collection of recordings that fit that bill, the Heco Allegros will suit ●

ic from  
 3-way  
 was going  
 ways, but  
 at the same

textures and tonalities. In music from these three-way speakers was going three ways, but not at the same time. Acoustic instruments didn't display a range of colour so much as a variety of textures, booms and twangs. On one recording, I would have sworn the guitar strings were elastic bands. For a moment you think you're on to something with what sounds as though it could be an incisive top end and a pounding bass - but then it disintegrates into wobbles and spits within the same bar.

Not one to despair easily, I tried biwiring and putting the grilles back on. Heywire had the virtue of at least subduing some of the spitty and sparky excesses, but with what should be fast dance mixes turning out as though the musicians and their instruments had become a bit damp. The top end was certainly smoothed over, and a South American harp suddenly sounded more recognisably like a harp than someone stubbing his toe on a piano. Vocals and instruments with a strong upper mid had their previously bitter moments ameliorated, though I'd hardly dare to say sweetened. Bases and drums became a trifle more distinguishable, but it remained hard to either follow a melody or tap feet consistently to a beat.

What had before been a slightly forward, but not realistically-scaled reproduction, stepped a couple of inches back and cleaned up the focus. Even so, the Allegros could hardly be rated high in the image stakes, with a sharpish left and right and a muggy middle.



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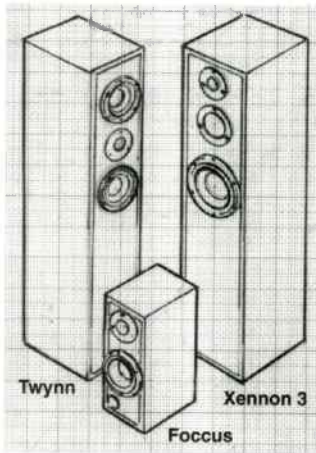
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One of the compensations of maturity is that it enables one to cast away guilt. As a hi-fi enthusiast I used to be riddled with angst - but no more! Though I still find the arguments for and against valves or silver-wire or absolute-phase secretly fascinating, I was frightened in the past of committing that most terrible of drawing-room crimes: being boring about the hi-fi. And that was simply the tip of the iceberg. I was racked with fears that ran deep. Fears I know others share. Just talk to the owner of an extravagant display of audiophile quality equipment and watch how they shift nervously from foot to foot explaining - almost apologetically - that it is only a means to an end. It is, they'll explain, the music which really interests them. Is it not odd that we should we feel the need to justify our obsession?

I shared too, the nagging doubt that I spent too much time fiddling with the hi-fi and not enough listening to the music. But a few years ago I got interested in flying light aeroplanes and, as anybody who has ever done any flying will tell you, as a pastime absolutely nothing comes close to flying for the amount of time spent doing something other than pursuing the purpose of the hobby.

### Orgy of Indulgence

At least fifty percent of the time spent at a flying club consists of peering out at dismal, foggy airfields drinking cups of revolting coffee. Ninety per cent of the rest of the time is spent standing in the blistering cold checking, mending, waiting and watching other people flying aeroplanes. Add preparing Flight Plans, Load Sheets and other paperwork and only about two percent of the time spent anywhere near aeroplanes is actually spent flying them. By comparison hi-fi as a hobby is an orgy of indulgence.

I suffered too the commonplace anguish that I spent too much money on audio equipment. But, I argued, other people spend greater sums of money on their cars and decorating and furnishing their homes so there was nothing uniquely extravagant about spending my money on hi-fi equipment.

And then came the blinding

realisation that I was simply weighed down by a twentieth-century, northern-European puritanism. The end need not always justify the means. Historically, people have sought to surround the act of making music with the best acoustic, the best craftsmen and couched the process in opulent surroundings.

Audiophile hi-fi equipment is the modern manifestation of this old, and noble, tradition. What is wrong with enriching our lives with objects which both serve a purpose and - by virtue of the care and skill with which they have been crafted - are an end in themselves?

All ceilings need to be



listening to music, it really is nonsense to ignore the peripheral psychological effects of where, when and how the music is being produced.

The anguish I associated with hi-fi was born of the mistaken belief that it is a profanity; a material obsession riding on the back of music which is unworldly and spiritual. I now know this is nonsense. Music is physical. It is a rich, wonderful, intense sensory experience which triggers deep psychological associations. It's 'aural sex' if you like! The time, the place and the extravagant paraphernalia of the production of music go hand in hand with its

# recorded message

Left by Richard Brice

painted. But if Pope Sixtus IV had put up with a coat of distemper we shouldn't have Michelangelo's Sistine Chapel ceiling. The Ponte Vecchio in Florence is only a bridge with shops on. I suppose it could have been constructed out of bricks and girders and look like Blackfriars railway bridge. It would serve the purpose just the same, but the world would be a poorer place for it. To argue always for bland utilitarianism is to argue there should be no interiors by Robert Adam, no carving by Grinling Gibbons, no architecture by Vanbrugh, no cars by Ferrari, no fabrics by Zandra Rhodes, no fashion by Chanel. We should have drunk all the vintage claret, swapped our Parkers for Birons and let Rolex go into liquidation.

I'm sure God hears the petitions of a sinner rising from the vaulted halls of an English cathedral no more and no less than he hears the prayer of a starving man in a shanty town. Extravagant opulence doesn't hold any absolute value but which of the two men would you rather be? Come to think of it, if it were not for extravagance in human affairs I doubt we should ever have stood up. Extravagance is everywhere in the world where people have thought to themselves, "Let's

fashion this a little better than it needs to be fashioned - let's make this pleasing to look at, uplifting whilst serving its purpose."

It's craft, not art, that enriches the material lives of ordinary people. I don't own even a minor masterpiece of the quattrocento and I confidently expect that I never shall but I can own well crafted things for my home. I've learned to stop being priggish about the minor extravagances of hi-fi. In my own mind I'm sure that there is more to do with a delight in extravagance behind the use of precious metals in hi-fi than there is to do with electrical conductivity.

### Extravagance Factor

It is because this 'extravagance factor' is eradicated in double-blind listening tests that subjects in these trials fail to detect differences between pieces of equipment which they can distinguish when they know which amplifier combination or CD player is playing. Which magazine recently ran a report on CD players which concluded that, without knowing which player was in operation, there was no discernible difference in the sound quality between players in any price band. But with an experience as emotive as

inherent capacity to move and inspire. Monteverdi sounds its best in Venice, Mozart in Salzburg or Vienna, English cathedral music needs to be heard as it disperses amongst groined vaults.

Listening to hi-fi at home, different values obtain. It is one of the great delusions of hi-fi that it can ever aim to recreate the concert hall in one's own home. The experience of listening to music at home will always be very different to the experience when listening in a concert hall, but the same rules apply. All that a hi-fi ever needs to justify its existence is that it enhances and complements our pleasure. If, as in my case, that means serried ranks of glowing valves - so be it. The only necessary truth in the 'fidelity' of high-fidelity is the truth that is beauty, the beauty that is truth.

So I have cast away my guilt, remembering that if everything in the world were judged purely for its utility - how well it served its purpose - there would be no music to put through our hi-fi's circuits. For what could be a more pointless, extravagant folly than a group of grown up people banging drums, blowing down coiled-up brass piping and scraping horse hair across stretched catgut ●

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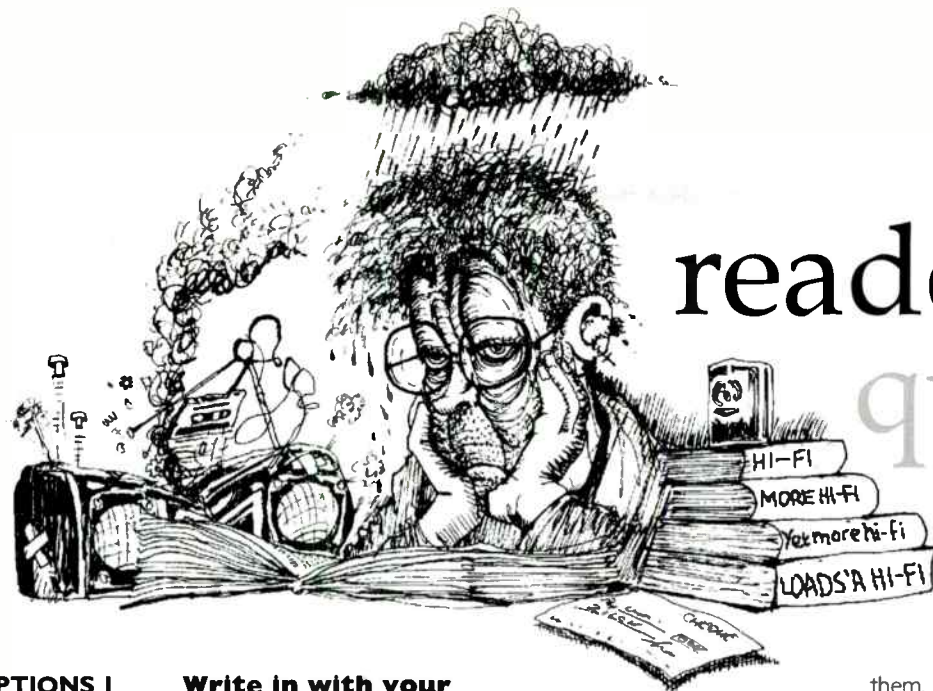
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# readers' queries

## UPGRADE OPTIONS 1

My system used to consist of: Sugden A48 (20years old), Harman Kardon 505-3/AT-95E. However, using my endless charm, I swapped this plus £50 for a Linn Sondek and Naim Nait2. Now for my problem: I still have the old interconnects (Tandy) and speaker cable is Audioquest F-14 to my Rogers 457s (original) on Target stands (the Sondek is on a Target shelf). Having begun my quest for sonic perfection I would like some advice as I am on an extremely limited budget, on the next steps. As I see it these are my options:

1. Have the Sondek serviced and upgraded to current spec (bearings etc.).
2. Buy a proper stand for amp and tape deck (Aiwa ADF270).
3. Upgrade interconnects and speaker cable to? (I am pretty snappy with a soldering iron and have access to R.S., Farnell etc.).

So which of these (if any) should I do first as I would like to have the system ready for an upgrade to Akito/K9 when funds permit?

**Andrew Collins,  
Sale, Cheshire.**

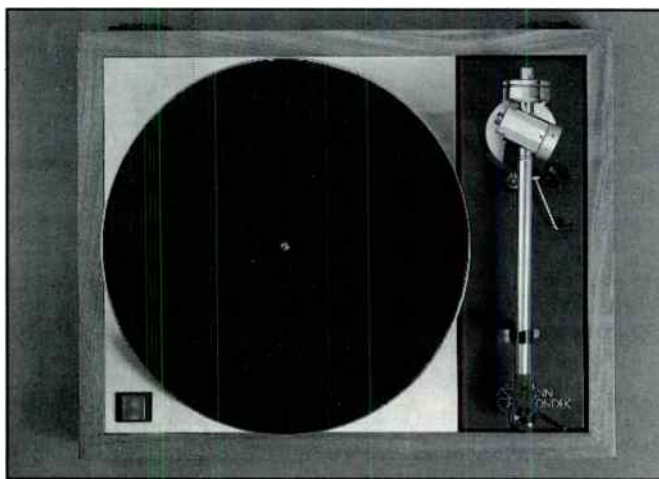
Your options are correct and in almost the right order. Find a Linn dealer (for they are a rare beast now) and discuss the options on the Linn. As you appear to know about the range of modifications and improvements, I believe that you have already done so. If the Linn is on a good support (like your Target shelf - as long as it is levelled correctly), setting-up is crucial, as it can make such a difference in sound quality.

Next, I would suggest that

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the interconnects and loud-speaker cable be changed. The AudioQuest F-14 should be the first change. I would suggest Naim NAC A5, or Linn K-400 if the loudspeakers are bi-wirable. The more expensive Tandy patch cords are surprisingly good, although they need to be shoe-horned into a DIN plug for the Nait amplifier. Otherwise, I have found that the Chord Company cables are a good basic

alternative, with the more expensive Sonic Link Pink and Violet cables offering the up-market option.

Finally, the table for the amp and cassette player. My gut reaction is to go for the same table manufacturer as the turntable shelf. I feel that if the support systems do produce any interference or sound into the system, then at least such effects will be acting in a broadly similar manner. Ideally, upgrade to a Mana shelf and equipment table, but until such

funds are available, go for the Target table for the equipment. **AS**

## MAXIM 3s

After reading your reports on Goodmans Maxim 3 in May Hi-Fi World and REL Stadium subwoofer June Hi-Fi World, I am considering purchasing both of these items and would like to know what amplifier you would recommend to complement

them, again with value for money in mind.

**P.J. Ariss,  
Plymouth, Devon.**

The Goodmans Maxim 3/REL Stadium combination was matched together to supply a low-cost system with ultimate bass performance. While the two matched together well, it must be pointed out that the main loudspeakers, the Maxim 3's, are still budget models and do not have the mid-range performance of more expensive designs. At a higher cost, partnering the REL Stadium with a pair of Rogers LS2a/2 or LS3/5a, or the Harbeth HL-P3 would produce a better overall loudspeaker system.

If you are still set on the Maxims, however, as in the preceding query, I would suggest a Denon PMA-350 or Harman Kardon 6150 where value for money is the main criterion of choice. If you are looking for a more expensive system, then Audiolab's 8000A, or the Sugden A48B amplifiers would suit. **NK**

## UPGRADE OPTIONS 2

I would like some advice about upgrading my system. The system comprises an Arcam Delta 70.3 CD player, Nytech CA 252 integrated amp, Linn Kan 2 speakers, Linn Kan 2 stand, Linn K20 cable and a Nakamichi cassette deck.

The CD and the Kans are new whereas the amp and cassette deck are as you have probably guessed quite old in years but not in wear, to cut a story short. The upgrade will not include the cassette deck in this phase as I consider it will

always be my weakest component.

How substantial an improvement in sound quality will I get for spending about £1000 to £1500 on the upgrade? Obviously if I can get the substantial upgrade for less all the better. Could you put forward any suitable ideas for my upgrade.

**T. Seddon,  
Denton, Manchester.**

Within your budget, I would suggest a Naim NAC 62 or NAC 72 preamplifier and a NAP 140 power amplifier or a Linn Pretek preamplifier and a single Powertek power amplifier. Eventually, this could involve adding a second Powertek and changing over to Linn K400 bi-wire cable. Either system would benefit from Sonic Link Violet as a CD-preamp interconnect and would suit both the CD player and the Linn Kans well.

For the next step, I would suggest that the next step would be adding Townshend Seismic Sink baseboards or Mana tables throughout. These would help to isolate the system from its environment and improve the sound quality dramatically.

Finally, as your cassette deck is a Nakamichi, I would suggest that a routine overhaul would benefit. Such comparatively painless changes would wrest the maximum from your loudspeakers and source. **AS**

### MAINS FILTERING

I have moved to a new house which has very poor mains with severe transients, which appear to come from an outside source. They are infrequent but have blown the PM3 drivers of my Lowther TP1 loudspeakers. They will now have to be returned to Lowther Voight for repair/update. Would you recommend a mains filter? I have seen a lot of adverts for the Pure Power Conditioner from Radar Developments.

The rest of the system comprises Garrard 301, SME3009 MkII Improved, Nagaoka MP30, Nakamichi CR4 cassette deck, Technics SL-P222A CD player, Optonica ST5200 tuner, Sony TC377 open reel and Radford SC22/STA25 MkIII valve amplifier.

Could I just run the amplifier from a filter or would the whole system be better run from it? Are there any alternatives?

While moving the Radford wasn't used for about 6 months, during which time its performance has deteriorated. Imagery has become very poor and at times distortion is noticeable. Is this a sign of the valves needing replacement, or is it something more serious? If valves, do I replace some or all? Valves are by Mullard and Brimar.

3) The Nagaoka needs a new stylus because it is now getting on. Would a new cartridge be a better option? If so, what would work with the Garrard and SME?

4) The Technics CD is outclassed by all the other sources and will be my next major upgrade. Do you have any suggestions as to what I should be auditioning? Would it be worthwhile using an outboard DAC with the Technics?

Any other comments with regard to improving the system would be appreciated. After the CD upgrade, what should be next?

My musical tastes are very

of thing for tests on mains filters, so are unable to measure their performance.

Where the problem is severe, special isolating transformers with heavy Faraday screening are used, often in conjunction with low-pass filters. These were originally known as 'mains conditioners', although there are many cheaper, so-called 'conditioners' that are supplied without transformers. The real thing is expensive, typically costing hundreds of pounds. They are effective though. Ideally, your whole system should run from one, meaning a current capacity of at least 5amps. However, before going this far, I would suggest you write to your local supply authority asking them to identify the source of the interference and whether they can offer any solutions.

I think the most practical starting point is a mains filter, without the expensive transformer. It might well be adequate, if not perfect. Cirkit, who supply electronic components, offer a four way filtered distribution block of 13A outlets, priced at a reasonable

and you may find other items need to as well; it all depends upon their immunity to mains surges, which itself depends upon individual power supply design. This is not something that can be commented upon from a distance. Make certain the house earth is truly going to ground as well. A copper earth plate is always a good idea, something that will improve safety as well.

The fact that distortion is becoming apparent from your Radford makes it likely that one of the output valves is going. They must be replaced in matched pairs, but the amplifier may need to be rebalanced all the same. Ideally, on an amplifier like this where capacitors and resistors are old and possibly dodgy as well, quiescent and AC conditions should ideally be checked every so often as a matter of course. This is the main drawback behind owning an old valve amp. The only firm contact we have in your area is Audio Laboratories of Leeds.

Contact:  
Audio Laboratories,  
3 Kildare Terrace,  
Whitehall Road,

LEEDS LS12 1DB.  
Tel: 0532-440378



As a replacement for your Nagaoka, we would suggest one of the better Goldring moving magnets, like the 1040. This is a fine-sounding cartridge and it is reasonably compliant too. You could also consider one of the latest Shure cartridges, such as the VST-V.

A replacement for the Technics, much liked by all who hear it, including us, is Rotel's RCD-965BX. Outboard

convertors do not seem as effective as one would hope when paired with budget players. Paul Miller tells me that his new super wonder testing gizmo from Hewlett Packard (meaning it's mega complex and expensive) shows that budget machines are very variable and often quite poor in their jitter performance. This may explain why advanced DACs seem not to shine when fed by budget transports.

Expect to hear much more on this topic in the future. As new digital domain test equipment becomes available

varied and cover everything from heavy Rock to Blues, Country and some Classical.

**Stephen Clarke,  
Armthorpe,  
Doncaster.**

Ouch! Sounds like you've got a real problem from local, heavy duty industrial equipment (motors, welders, etc.), or from the Supply Authority switching. They can produce transients of up to 750V or so, full of high frequency content. We cannot replicate this sort

£29.40 in their Winter 91/92 catalogue. Contact: Cirkit, Park Lane, Broxbourne, HERTS EN10 7NQ. Tel: 0992 - 444111

We suggest you start here, and avoid other options, unless this proves to be ineffective. Many filter devices can detract from the sound of the system, so approach them all with caution.

You must run the amplifier from a filtered mains supply

and people become more sensitive and aware of obscure digital problems (instead of blindly claiming that digital is perfect, which is misleading nonsense), we shall see debate on this topic and, doubtless, immediate improvement from transports. Already, low jitter transports like the Arcam 170.3 are appearing, as well as ones that can be time-locked (clocked) from the DAC. I would suggest you consider this sort of set-up as an alternative to a one-piece player.

It's difficult to suggest much more to upgrade, since your system provides a rather unique sound. Anything we could suggest would change it rather than unequivocally improve it; it is for you to make judgements based upon your personal tastes and expectations. But the tuner could be improved. Try the B&W Aura TU-50 tuner; it's a great sounding unit at the price (around £225). Unless of course you'd like to stay with valves, in which case there's nothing at a sane price that can match a *good condition* Leak Throughline. **NK**

### SETTING BIAS

I am writing in the hope that you can explain my recent experiences with the bias settings on Linn Ittok and Ekos tonearms. Linn recommend that bias is set at the same value as the tracking weight. However a friend lent me a test record with a bias setting track, i.e. an ungrooved section, the theory being that the arm should not move if the bias is set correctly, exactly opposing the force pulling the stylus to the centre of the disc.

With an Ittok/K18 combination tracking at 1.75g the test record suggested a bias of 1.9g. Fine I thought, the scale is slightly out of calibration. The confusion started when I upgraded to an Asaka and decided to check the bias before dropping my treasured new stylus into the groove for the first time. Even at maximum bias (3g) the stylus still merrily skated inwards towards the centre of the disc. For a while I had the alarming notion that the bias wasn't working at all - but my dealer checked the arm and it was fine. The question is why do the test record and Linn disagree? I know Linn don't



believe in test records, but is there a scientific reason why the bias settings for a test track and a real track disagree so markedly? It seems that the different masses of the K18 and the Asaka change the bias required. In that case why is it always set to the same value as the tracking weight no matter what the cartridge?

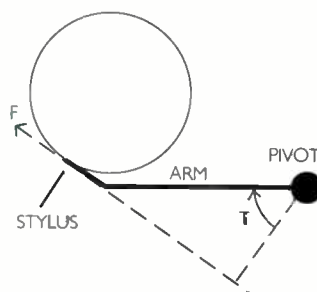
Finally, to add further confusion, I have now tried the same experiment on my current Ekos/Troika combination. The test record indicates a bias of 3g is required for a tracking weight of 1.7g - and I think the sound is better at the 3g setting! The sound is fuller but clearer. Individual notes stop and start more clearly, enabling me to hear rhythms I had never noticed before. It's not just me either, a friend, also with Ekos/Troika, has tried the same trick and prefers the higher bias setting as well. Perhaps all Linn owners should give it a try?

I hope you can shed some light on this.

**Kevin Harrison,  
Ashford, Middx.**

As is so often the case, there are no definitive answers to this problem. It is one that has been discussed, even argued about long and hard, yet to no avail. It will only disappear when the LP does.

Firstly, a quick explanation of the basic problem. The direction of the frictional drag



force ( $F$ ) on a stylus runs along the axis of the headshell. Because this is always at an offset to the arm tube, the force doesn't run through the bearings, so it generates a rotational torque ( $T$ ) on the arm. The arm tends to want to twist inward, forcing the stylus harder against the inner groove wall than the outer one. This tends to make it ride up the groove side, inducing mistracking. Consequently, a counterbalancing outward force must be applied, often by weight and thread (e.g. SME 3009) or by magnets (e.g. Rega RB-300).

The exact inward force varies according to modulation, stylus dimensions and shape, tracking force, disc material and, arguably, by groove speed. Whatever, it is generally agreed that setting bias has to be a compromise; it is not and cannot be a precise science.

The trouble with bias setting on an ungrooved surface like that found on some test discs (e.g. Decca) is that this situation doesn't represent

real-life operating conditions. The stylus normally sits in a groove, its side walls in contact with the vinyl, but the tip clear of the groove bottom. On a flat surface only the tip alone contacts the vinyl.

I set bias force by using tracking tests and noting which channel starts to buzz first, indicating mistracking. Bias should be adjusted so that as the stylus starts to let go, both channels buzz at the same time. If the cartridge tracks so well it won't let go, lower tracking force a bit or tap the plinth to unsettle it. None of this is especially scientific, but I've never heard of any better solution.

The bias finally settled upon by this process can be taken as approximately correct. You might then like to raise or lower it by around 20% maximum to see if sound quality improves. One has to bear in mind that bias also alters the mechanical working position of the cartridge generator mechanism, which may also affect sound quality, making final experiment worthwhile. **NK**

### STICKY PROBLEM

A simple one - what's the best way to clean my LPs? I used to use Discwasher and cleaning liquid system. The system had a handle and a ribbed felt pad attached and was excellent but is 8 years old now and I have run out of liquid. (I have been using CABRA Record and Cassette cleaning fluid on the pad.) Also I should think the pad is losing its effectiveness as it doesn't clean like it used to.

In your special audio accessories you list two similar (to each other) vinyl cleaning systems - Nagaoka Rolling Record System and Pixall Mk II Record Cleaner.

Quite simply - which is the best (how do you keep the Nagaoka system clean - you mention no replacement roller) and are these the best systems - they seem a little - well, unbelievable somehow. Please reply as I have some dusty Blues vinyl wanting desperately to be really cleaned up.

**John Hunter,  
Rushden, Northants.**

Traditionally, the best record cleaning machine was considered to be the Keith Monks, but the latest top VPI, Moth

and Nitty Gritty machines are all pretty close. These are all relatively expensive, powered machines, but do arguably clean records better than is possible with manually operated systems. The Knowin Disco Antistat is possibly about the best of the manual systems currently available. Use these for an occasional 'deep clean' of records.

For day to day use, I prefer the Decca Diplomat or '2+2' carbon-fibre record brushes, used dry. These are very good at removing surface dust and lint, but they leave a small line of dust at the point of removal. To remove this fine line of dust, switch the turntable off and use the Pixall or Nagaoka on this one area.

The two rollers perform identically, acting like fly-paper to dust on the record's surface. Where they differ is that the Pixall uses a replaceable roll of sticky tape, whereas the Nagaoka is made from a washable sticky material, similar to Sorbothane. Both rollers appear to balance each other out in the value for money stakes, with personal preferences being the only key issue between the two.

If you want to try liquid, just on the off chance the fluid you've been using is less effective, ask your local chemist for Isopropyl alcohol and distilled water; mix the two in the proportions of one part alcohol to four parts distilled water. **AS**

### TROUBLES WITH CHROME

I am, in the near future, getting rid of my old Panasonic SG4000 music centre (yes there are some of us who still have them) for a 'separated' stack system. I am wondering if you could help me with the following.

I notice that most, if not all, pre-recorded cassettes are of CrO<sub>2</sub> (chrome) tape, but it states on the album insert that for optimum results the tape recorder should be set at low/normal setting (120µs). Now as I was thinking of buying a tape deck with an automatic tape selector, how will this affect my tapes (pre-recorded); surely it will 'automatically' select chrome when I insert cassette thus giving me a poorer play back sound quality?

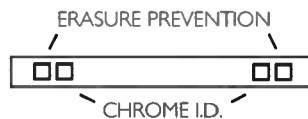
I have a CrO<sub>2</sub> tape selector switch on my old SG4000 and I

have tried my tapes on this setting; playback is definitely poorer than the normal setting. Therefore should I opt for a manual tape selector deck? I do 99% of my listening on headphones, making change of quality on playback very noticeable.

I also have tapes sent from the States on TDK SA tape (I use TDK tapes all the time) but I think my friends record them on normal setting as they sound better on my old centre with setting at normal rather than CrO<sub>2</sub>, which adds to the problem. Should I opt for an automatic tape selector deck?

As you can see I am a novice! So a plain understandable answer would be most appreciated. It would be wise to

tape alongside a new chrome blank tape. Note that the (outer) record prevention lugs on the prerecorded tape are missing, but it doesn't have the inner chrome identification slots, so it is seen as a ferric by



automatic tape type sensors.

If you replay prerecorded tapes with chrome equalisation, they will sound very dull, even muffled, so I would expect you to prefer the proper 120µs normal setting.

In the case of blank chrome tapes from your friends, they should sound right at 70µs, and



add here that I will probably spend approximately £500/£600+ on my new system that will comprise record deck, (I have a lot of vinyl), tuner, tape deck (probably a twin deck) CD player, and of course an amp.

Not mega bucks by your standard, but I hope to get good value and a pretty good new system - I would appreciate your advice rather than the man in the shop - also I listen to Blues music (bands etc.)

**John Hunter, Rushden, Northants.**

**Yours is a common misunderstanding. The music biz uses chrome tape in its pre-recorded cassettes, but records it with ferric/normal (120µs) equalisation to improve the treble overload ceiling. Consequently, the tape must be replayed as a ferric.**

**You can check this for yourself. Put a prerecorded**

**bright when played at 120µs. However, azimuth errors, wear and oxide build-up all produce treble loss. Music centres are not especially accurate in their azimuth and replay equalisation in the first place. These losses are being counteracted by using 120µs; the correct 70µs setting I would guess sounds dull in comparison.**

**The answer isn't to go out and buy yet more mediocre 'audio' equipment. Forget rack, stack and gizmo systems; they really are poor value. We are constantly told by surprised, even amazed, friends that the simple hi-fi systems we recommend have so impressed them and increased their enjoyment of music, they can't believe it. For what you intend to spend, real hi-fi and proper cassette playing is just within your reach.**

**An NAD 6325 cassette**

**deck (£170) with Play Trim meets your needs well. It is one of the few decks left with selectable bias/eq, so you can choose 120/70µs (ferric/chrome) replay equalisation if you so wish. However, Play Trim varies replay eq. as well, like a form of specialised treble tone control, a feature that effectively corrects for losses and mismatches. This will enable you to adjust replay conditions to suit the tapes you play, irrespective of their source. Add a budget amplifier and tuner, like a Denon PMA-350 (£170)/Harman Kardon HK6150 (£160) and Denon TU-260L tuner (£110), good budget speakers like Goodmans Maxim 3s (£110), a**

**Rega Planar II (£185) with Goldring 1012 cartridge (£50) to make the most of your LPs and buy the new Sony CD-497 CD player (£185) tested in this issue to spin the silver frisbees. I strongly suggest you avoid twin cassette decks unless you have a real need for dubbing. **NK****

### LAID BACK

In the relentless pursuit of improvements in the sound

of our hi-fi, my wife and I have recently invested in a Meridian 200 CD transport and a Roksan ROK DA-1 DAC. The rest of the system consists of a Linn Axis (Akito arm) turntable with ATF5 (Stilton) cartridge, Arcam Delta 90 (original model) amplifier, and Heybrook HB2 speakers (approx 11 years old). We also use a Denon DRS-610 cassette deck.

Whilst we are very happy with the improvements that the Meridian/Roksan combination has made in sound over our previous Phillips CD650/Arcam Black Box combination, we still feel that the overall sound of the system is a little 'laid back' most notably at low volume. We listen to a wide range of music from Mozart to Prince, but more 'pop' than classical.

Considering the age of the Heybrook speakers we are considering replacing those, perhaps with something like the



Epos ES11, the Arcam Delta 2, the Rega Ela, or Linn Kans. However I feel that the amplifier may be the cause of the laid back sound so should we upgrade this first? If we do change the amplifier then I would like to go for a pre/power amp combination. The budget for the upgrade is up to £1000.

We would appreciate your advice on which changes we should next make to the system.

**A.K. Blunsden,  
Ware, Herts.**

Like you, I suspect the amplifier. The Delta 90 Series amps were smooth and civilised, which can be fine with some loudspeakers and for some tastes. More life and vigour is possible, however. Unfortunately, to complement the high standard of your front end components, you really need to choose a good amplifier, one that is both lively and yet refined. The two properties are not common bed partners. My own leaning here would be toward a Pioneer A-400, one of whose great and unusual strengths is to combine unusually sweet and open treble with a solid bass performance. Another option here is the Naim Nait 2, that matches the Kans and the Epos well, although its lack of power and limited number of inputs may prove a problem in the long run.

A problem I find with pre/powers is that they vary quite widely in character and ability. Those that seek above all else to be powerhouses can sound quite crude in presentation; you'd be very unimpressed I suspect. Those that aim to improve performance all-round may not provide the sort of marked contrast to the sound you may be hoping to move away from. I personally favour the Audiolab 8000C/P (control and power amps.), but they are less dynamically characterful than an A-400, if more atmospheric, revealing and cohesive in presentation. Alternatively, the Linn Pretek/Powertek amplifier combination is powerful and musical, although somewhat lacking in fine detail. It would be best if you could audition these options.

Your short list of loudspeakers is wild! They vary in character and presentation enormously. At the price,

check out the Epos ES-11 first. The Kan is an acquired taste (not mine); some swear by it. It offers speed in Rock, arguably at the expense of other properties. The Kan is almost the opposite of the Rega Ela, with its typically transmission line bass; deep yet slow. Alan and Eric favour the Epos, but suggest Rogers LS3/5a and Harbeth, HL-P3 should be added to the list. **NK**

### STEREOSCOPIC

There are occasions when, due to overall length of a programme, or due to inconvenient time of broadcast, when I record sound from radio on my VCR, using the AV sockets. This works O.K. but my present VCR is mono. The quality otherwise is not too bad. It does need updating.

I know there are two new audio recorder systems in the offing (mini disc and didi cassette). I do wonder about upgrading my VCR to stereo.

When VCRs are sold or advertised, all their merits as video recorders are explained. It does not seem at all possible to discover the sound record/replay quality - frequency response, distortion etc. No one seems to expect a VCR to be used in a purely audio mode (in between video recordings of course).

Can you advise, please, how to discover this sort of information. Perhaps you could review a sample of VCRs from a purely audio aspect.

**F.D. Cosgrove,  
Bournemouth, Dorset.**

If you cast your mind back to the first few issues, Danny Haikin wrote of using a stereo VCR for just such a purpose, in addition to its ability for recording Vic Reeves' Big Night Out.

Although the VCR format offers rock solid stability of sound, his must be tempered against the disadvantages. First, the size and cumbersome nature of the VCR machine makes it comparatively unwieldy in use as an amateur recording format. Obviously, using a VCR for such a medium precludes in-car or 'personal' use, unless you like carrying a camcorder on the tube.

More importantly, however, is that many stereo VCR machines compress their audio signals slightly, giving a slightly

flat and dull sound against the best hi-fi tape machines. Bearing in mind that a good Stereo VHS recorder is going to cost around £300 - £350 or more, the cassette tape competition is fierce, with the Nakamichi Cassette Deck 2 leading the field. **AS**

A number of cassette recorders of various breeds offer timer operation through use of an external timer; if length of programme is a difficulty, Digital Compact Cassette recorders will offer auto-reverse and longer tapes next year. Sony's Minidisc is expected to offer 60-70 minutes recording time. **EB**

### CONFUSED OF WIRRAL

I should be most grateful for advice over changing to another hi-fi outfit. There are so many systems that a non-expert (myself) is becoming confused. I will be as brief as possible.

I am a pensioner (ex musician). At the moment I have a mixture of hi-fi. A Goldring-Lenco pro turntable and tone arm, and a Sony amplifier, and two quite efficient loudspeakers. All work satisfactorily, but I am short of a CD and cassette player, and although I have two radios, they are years old.

Having read Alan Sircom's article re complete hi-fi for approx £1,000, I would appreciate your opinion about it. Seeing that LP, apparently, is fading away, would you change over from the Goldring turntable for the new L/S choice? My loudspeakers are good, but old!

If I kept the Sony, speakers, and turntable, could you recommend a decent Compact Disc player and a good cassette at prices totalling altogether for the two at approx. a few hundred pounds. Also a decent well-sounding tuner. You have such a multiplicity of systems in your latest issue that as I say, it is confusing.

My own general choices were Philips, Sony, Technics, Arcam's own Alpha players (as mentioned in AS's article).

We have radio/hi-fi shops in Liverpool and district, but I am unable to travel far, and it is too tiring to discuss all the options at length; so your help would be appreciated.

It boils down to your appraisal of the components

mentioned in the article.

Question: If I decide to keep most of my present hi-fi, then your recommendation of a good quality CD player, cassette and a good quality tuner.

I apologise for perhaps starting you with a headache, but it would help me enormously to make up my mind as to what to do.

**George Harris,  
Wirral.**

Briefly, if it works, don't fix it! If the age of the equipment is the only stumbling block, then do not be concerned just because a large number of classic hi-fi components are of pensionable age.

As long as the Goldring-Lenco still functions well, why change it? Moving over to Compact Disc at one fell swoop is a very costly exercise. Instead, get the Lenco serviced by someone like Loricraft Audio in Lambourne, Berks. (0488) 72267, fit a new cartridge and rediscover your record collection. I would suggest that you keep your turntable and your record collection and start a separate CD collection.

Assuming that the Sony amp is of the same vintage, then it should be well-built, sounding big and warm, although not particularly dynamic. The only drawback may be a lack of inputs. While there will be tape and tuner inputs, a CD input may be harder to come by. There should be an 'aux' line level input, but if not try using a QED switching box. If all else fails, try out an Arcam Alpha 3 or a Pioneer A400.

Of the CD players that you mention, my favorite would be the Arcam Alpha, although this may sound too warm through the Sony. Alternatively, look at the Pioneer PD-9700 and the slightly cheaper Rotel RA-965BX. In the cassette deck stakes, the Technics RS-BX606 is difficult to beat, especially as I have seen it for as low as £130 in some shops. The other alternatives from Sony and the rest are more expensive, but the extra money is put toward the build quality, that gives the product possibly greater long-term confidence. Finally, get a good quality aerial fitted and go for either a Denon TU-260L or an Aura TU-50. It is difficult to better these two tuners without spending several hundred more. **AS**

...Continued from page 13.

systems 'compress' and that this differentiates them from digital systems. They start to compress only in overload, something that can actually be a benefit. It extends the usable range of analogue recording systems past that of their apparently better specified digital equivalents. Otherwise, analogue doesn't compress and no one I know believes that this is what differentiates the systems in sound quality.

Why and how you can assume that a CD player sets off room reverberations that are full of mid-band energy when you are not acquainted with the listening rooms used I find inexplicable.

Then there is the small matter of the ratio of direct-sound to reflected-sound you have failed to consider. When the former is strong, as it usually is, the room's contribution is not dominant. Analogue storage systems can and do work extremely well. The problem with current sixteen-bit digital systems (a format evolved in the Seventies), is that unless very well engineered and employed, they are barely adequate for music recording purposes. Highly experienced recording engineers (e.g. Decca) and equipment manufacturers tell us that eighteen or twenty bits of range encoding are needed to perfectly maintain the quality of live musical performances.

We are not anti-digital; both analogue and digital systems have problems. The big lie we seek to contest is that digital by its very nature is 'perfect'. It is not. Future digital systems will one day show just how imperfect our current ones are. **NK**

**FAST FOOD**

Over the years CD has been sold to the public by, amongst other things, virtue of its convenience. Convenience of storage, handling, playing, programming etc. - but since when did the enjoyment of music hinge around convenience? We music lovers suffer for our art don't you know!

Convenience in hi-fi has become like fast food - fills a hole but can hardly be called satisfying. However, I'm sure Mr. Murphy, who replied to an earlier letter of mine, will be delighted to learn that since writing I have heard both the Linn and Naim CD players. At

last here was something approaching music, or if you wish, haute cuisine, as opposed to fast food.

Both impressed me, although in different ways. They sound less like hi-fi, a feat that I believe is not quite within the grasp of the mid-price players Mr. Murphy so keenly touts. Listening to players in this price-band can be likened to standing outside a concert hall whilst the concert is played - you can hear it alright but you're not involved in the spectacle, you are remote, almost surplus to requirements.

The Linn and Naim players manage to draw you in to the performance in a way similar to good analogue sources and as such we should applaud them, along with Roksan and Micromega, for their efforts. Perhaps their example will spur on the manufacturers of less costly machines to follow suit.

**Gary Haste,  
Daventry, Northants.**

At present, the quality of implementation used on both the Linn and Naim players, together with the very best of the American and Far Eastern players, is such that it would be near impossible to produce at a lower price at the moment. As in motor racing, however, these Formula One technologies will eventually filter down to more humble CD players. For example, the superb two box Naim CDS has successfully begat the less expensive single box CDI player.

My only fear is that the keepers of this technology do not cling too rigidly to it, so that it stays outside the grasp of the majority of manufacturers. This is an easy way to produce an elite, yet it also does not allow for future development. **AS**

**PAPER & OIL (SINGLE ENDED)**

I read with interest Richard Brice's article on the relative merits of single-ended and push-pull output stages in valve power amplifiers.

I would have to agree that judged by conventional engineering standards the choice of a single-ended configuration does appear somewhat eccentric. Judged by the same standards, the use of valves at all seems strange, for conventional measurement techniques tell us that solid state electronics will give markedly superior performance.

Despite this many people still choose to use valve amplifiers

and vinyl records. It is probable that conventional measurements still fall woefully short of providing enough information to usefully describe the performance of certain types of audio equipment.

Although, theoretically, push-pull operation has much to commend it, there are in fact many potential sources of distortion in this type of configuration. All will result in an imperfect summation of the two phases in the output transformer.

There are many different phase splitter designs. Some are better than others, all are audible and none are 100% accurate. There will be differences between the two phases under dynamic conditions. The driver stage valves and the output valves must be perfectly matched as must the windings on the transformer itself.

Single-ended operation does not need a phase splitter, or matched valves (unless it's parallel single-ended). It is, however, far more critical of the quality of its power supply and of the design and quality of the output transformer. Both of these raise the cost of a good quality single-ended amplifier far above that of a similarly powerful push-pull amplifier. The output transformer is not just larger, it can be wound differently, incorporating air gaps in the core to reduce the likelihood of saturation.

Single-ended working will never be a low cost solution; indeed it is easy to make a single-ended amplifier that sounds a lot worse than a push-pull amplifier. If for example the power supply is poor then the end result is a sound that is too saccharine for it to be described as accurate. But if all the right ingredients are included, it can give a result that is unmatched for its clarity, purity and dynamic ability. There are many manufacturers in the Far East producing single-ended amplifiers. I don't believe it will become so popular here until appropriate loudspeakers become more widely available - i.e. with a sensitivity in excess of 100dB SPL per watt.

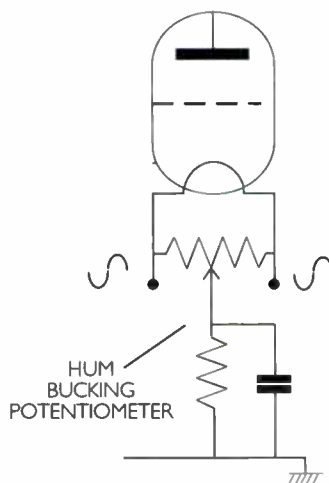
Given the recurrence of interest in valve amplifiers generally, I predict that the next topic for discussion may be the catastrophic effects of both silicon rectifiers and electrolytic capacitors on sound quality. Both of these only came about as cost saving devices (always a bad sign!).

In comparison with a power supply constructed using valve rectifiers, chokes and paper-in-oil

capacitors the newer technology sounds dreadful!

Finally, in relation to the Cary 2A3 amplifier and Norman Butler's letter in your June issue, it is usually perfectly acceptable to AC heat a directly heated triode provided that some form of 'hum-bucker' is used across the filament. This normally takes the form of a low value potentiometer, the centre leg of which goes to ground or to the top of the cathode resistor. The hum for any valve may then be easily cancelled using the pot. The Cary does not include this although it was normal practice 50-60 years ago.

**Guy Sergeant,  
Audio Components Ltd.,  
(Audio Innovations),  
Weymouth.**



Perhaps the future of hi-fi lies in its distant past. I have been informed that the old Leak TL/12s used paper-in-oil caps and I'm convinced that we shall soon see Audio Note amplifiers with hand-chewed-by-Zen-monks paper in oil caps as well.

This is not simple nostalgia, but maybe over the next few years we shall see some of the old favourites come back. Like smog, rationing and The Black Death. **AS**

**MUSICAL MOZART (SINGLE ENDED AGAIN)**

I feel that I must take pen to paper and tell you about my hi-fi system.

In 1984 I bought a set up consisting of a Rega Planar 3 turntable, RB-300 arm, R100 cartridge, Creek CAS4040 amplifier and Monitor Audio R252 loudspeakers. After what I had before, this system sounded perfect, if a little bass heavy.

I plodded on with this set up until last year when I bought a T2 stand for the record deck. The whole system sounded clearer. Whilst I was at the hi-fi

shop, Audio Images, I heard a valve system by Audio Innovations. It seemed to almost touch me physically with its presence and emotion. I had to have one. Problem, not much money. So I made do with upgrading my cartridge to an Ortofon MC3 Turbo high output moving coil. What a difference! It sounded like all my records were new and had much more clarity and musical ability. Then in your April issue, I read a letter written by Haden Boardman of Audio Classics about a single-ended output amplifier called a PYE Mozart.

I have since purchased two PYE Mozart amps and a Croft Micro Pre Amp. The Mozarts have been modified to work as Monoblocks and stand by my speakers.

These amps are absolute killers. The EL34 valves driven like this make a rhythmic and most coherent sound and produce almost a tangible image in my listening area. Silences seem darker and crescendos catch you by surprise, almost making you jump. On Neil Diamond's 'Hot August Night' album, the drumming in the prologue is there in front of you and Neil Diamond sings to you personally.

So thank you Haden Boardman and PYE Mozart and Hi-Fi World for helping me to tube delight. My next step is to try out a silver disc machine in the system, any suggestions which one? Haden Boardman suggested directly wiring one up to the Mozart.

**Peter H. Day,**  
Southwold, Suffolk.

Well, well! Congratulations on being a pioneer into single-ended valve amps. In the East, they're big news, in Britain they're still not recognised or appreciated. The PYE Mozart is a much talked about beast that we have yet to secure for assessment. Your experiences give us confidence in its reputation. We have, however, heard the £34,000 all silver wired Ongaku and can say that it is spectacular in sound quality, displaying all the properties you mention in great quantity. **NK**

#### CD BLUES

Australian readers of Hi-Fi World won't know what it is like 'to die for the voice of Mary Black', because we did not receive the promised CD in the April edition. We were both really looking forward to hearing this CD as we have received and

enjoyed other CDs in the past.

The previous month's promotion did not say that Aussie readers would be excluded from the offer, in fact it said 'The April edition of Hi-Fi World . . . will give everyone the chance to hear the voice that has soulfulness, passion, etc!

Yours is a vastly superior and more informative magazine compared to our local product - even at twice the price and a month late, but why the inconsistency?

**M & T Pearce,**  
Warners Bay, NSW,  
Australia.

**Overseas consignments for bookstand sales suffer high 'wastage'. Putting an expensive CD on the front exacerbates this problem and increases our losses. Since we are not a giant publisher, but a group of dedicated hi-fi enthusiasts, we cannot absorb such losses. I can only apologise for this situation, which is beyond our control. The best way to get the CDs overseas is to subscribe. NK**

#### BASS PROBLEMS

I have been reading with interest the reviews on the recent REL subwoofer systems, including that on the Stadium in the June edition of Hi-Fi World, and would like to make a few comments.

If you have a good memory you may recall that I was responsible for originating the whole "Infra-bass saga" around twelve or more years ago!

In 1980 I ran a demonstration to the public at the Cunard Hi-Fi Show, Hammersmith. In it, I was able to convince the public of the importance of frequencies in the 5Hz to 20Hz range, with the aid of a pair of special speakers (with a flat response  $\pm 3\text{dB}$  down to about 4Hz) and a microphone and analysing system loaned me by B&K Laboratories.

What puzzles me in the reviews of the REL devices concerns the following technical point.

I hold three currently active patents on the design of infra-bass and other speaker systems, and, to my knowledge, there is no way that clean, really distortion free bass can be produced from such small cabinets to such low frequencies and at such high levels, apart from the patented techniques mentioned, when used in a normal domestic environment.

My designs employ radical loading techniques which are patented. I have spoken with REL by phone, suggesting to

them that they might like to manufacture something with real Infra-bass 'under licence' - or perhaps of similar specification to the Stadium but of 1/3 the size and requiring no additional amplification to obtain the necessary gain. I am awaiting their reply.

As I stated many years ago - "The correct rendition of the sub bass information in proportion to the remainder of the audio signal is essential to the perception of the acoustic space in which the music was originally played, for this allows the transient envelope of the transient echo chain, which carries this information, to remain intact and unscrambled. It also preserves the individual character of live instruments, vocalists etc. for precisely the same reasons."

**Graham Holliman,**  
Watford, Herts.

I do remember seeing your articles on sub-bass in Hi-Fi Answers and, at the time, thinking how I agree with you. However, this was only because I had reached the same conclusions, from experiment and consideration of the problems.

Your claim to be responsible for "inventing the infra bass saga" is where we would disagree. The necessity to reproduce deep bass, below the threshold of ordinary hearing (i.e. around 20Hz), was appreciated not only by myself at the time, but by others too, I can assure you. Your claim to exclusivity of knowledge in this area I would not support.

My abiding interest in this topic is the reason I have worked on and produced improved equalisation for Celestion SL6000 subwoofers, to make them work more capably and to match them into Quad ESL63 electrostatics. It is the reason we featured the REL subwoofers and it is also the reason we have both the test equipment and the ability to carry out meaningful sub-bass measurements.

Quite whether REL have infringed your patents is a matter for you to determine. Please understand that others do know about such things and that you have no automatic claim to any sub-woofer that works simply because you once wrote about the subject. **NK**

#### BRASSO

As I passed by a new hi-fi shop in a nearby town the other weekend, I thought I would pop

in and have a look. As I looked at the array of appetising equipment I suddenly remembered I was after a CD cleaner. I walked over to the counter. "What do you have in the range of CD cleaners?" I asked.

The salesman got down under the counter and fumbled around for a moment and then produced a rag and what looked like a tin of Brasso. IT WAS A TIN OF BRASSO!

The salesman grinned at my astonishment; there was a moment's silence before I murmured "You're pulling my leg!" Without saying a word the salesman walked over to the CD player, playing Chris Isaak, and removed the silver disc. With Brasso on the rag and the CD label side down on the counter the salesman scrubbed the disk explaining that this treatment removes the scratches. Back to the player the salesman went and opened the CD player's drawer. With the volume turned up the tuneful notes of 'Blue Hotel' filled the shop. It still sounded good, just as before.

Has this salesman gone bananas, or have I missed something? Is this a ridiculous tweak I have not yet heard about? I was advised to go to the hardware shop next door and purchase a tin - I didn't.  
**Stuart Johnson,**  
Weybridge,  
Surrey.

Just as well! I have tried using Brasso on a CD, in an attempt to find something that could rescue a scratched disc, and I can assure you it causes irreparable damage. Because Brasso is a fine abrasive it produces myriads of scratches that scatter the laser light and make the servo tracking system go haywire. A quick rub over the disc surface doesn't cause enough damage to overwhelm the laser, although I did find that error rates go up dramatically. Anything more than this however and the disc will become unplayable. Whether the surface can eventually be restored by successively using finer abrasives (like jewellers rouge) I didn't have the time to find out. But I doubt it, since the surface will become concave and its optical properties lost for ever I suspect. **NK**

# PERSONAL LISTENING CENTRE

At Audio Technica we enjoy a worldwide reputation for producing the delicate transducer products which turn soundwaves into electrical impulses and vice versa. Our headphone range makes the most of these skills and today offers the keen listener a model to suit any budget or situation.

From the top there's the 900 Series, offering a 'larger than life' sensation courtesy of large diameter drivers and copper clad aluminium voice coils. Highly technical stuff you'll agree, but so do the hi-fi press ... 'the ATH 911 performs very well overall and it would be a safe recommendation for anyone who wants good, detailed sound, remarkable comfort and extremely high standard of manufacture' GRAMOPHONE.

Featuring many 'high end' advances, ATH 309/308 are perfect mid-sized headphones. High sensitivity, low weight and extreme comfort make them stand out from the competition. For the totally modest audiophile, our ATH-L1a takes some beating. In fact nothing else did according to 'What Hi-Fi?', who proclaimed it to be the very best budget headphone.

Call into our Personal Listening Centre soon at good specialist audio stores nationwide.



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ATH-911

ATH-910



ATH-909

ATH-309



ATH-308



ATH-L1a

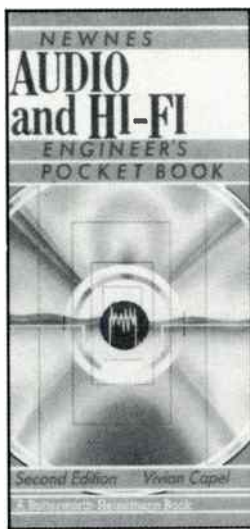
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**NEWNES  
AUDIO AND HI-FI  
ENGINEERS POCKETBOOK**  
VIVIAN CAPEL £10.95  
BUTTERWORTH-HEINEMANN  
ISBN 0-07506-0234-1

● This modest looking little book is more than a gold mine of facts: it is one of the most wide-ranging reference works to cover audio I know of. And it is very strongly tilted toward pure hi-fi coverage. These days, with hi-fi as a technology slowly slipping backward in recognition and status, authors and publishers often feel obliged to add electronics, television and video into the mix. Vivian Capel's book is true to its title: it is concerned with audio and hi-fi alone.

A great potential benefit of specialisation, realised with this book, is breadth and diversity of coverage. Instead of the obligatory few words on Class A and what have you, topics that fill most of the audio dictionaries that sit redundant on our shelves, the Audio and Hi-Fi Pocketbook ranges far and wide. Updated in 1991, it includes rarely found book topics like DAT and DCC. The author has long had an interest in tape recording, which accounts for the rare coverage I found on tape heads and tape head materials. Want to know what a Sendust head offers in the way of benefits? This book can tell you in brief but adequate outline.

I notice also that a large proportion of the abbreviations and acronyms that spice audio are explained, from PASC through to MOL. Then there's brief but succinct analysis of rarely covered and now fading technologies like arm geometry and lateral tracking error. Vivian Capel doesn't just describe them, but attempts to provide core equations that allow at least simple mathematical or geometrical analysis to be used.

Another small disappointment are the peculiar dimensions of the book. I suspect they are meant to make it

pocketable, but they also make it a bit cramped.

As well as broad but detailed coverage of hardware, from valve amps through radio right up to Compact Disc, DAT and DCC, allied topics like human hearing, musical instrument frequency ranges, and even room acoustics are covered. There is also a chapter on Public Address and a Reference section at the rear.

I am surprised references or a bibliography haven't been included, since the information in this book is sufficiently serious to warrant such a thing. There are at least two sources of arm geometry analysis for example: Baerwald and Stevenson. The book doesn't say from which source its information has been drawn. However, this is a minor point.

The wealth of topics tackled are necessarily dealt with briefly; there just wouldn't be enough room to accommodate so much information otherwise. This makes the pocket book more a source of reference than a general read. The level is pitched at technicians, students and engineers, rather than at non-technical hi-fi enthusiasts. However, I do feel that many enthusiasts would also find it understandable and useful in explaining much of jargon that appears in the hi-fi mags, for example, and others might find its coverage useful in guidance for a hobbyist concerns, such as loudspeaker design.

This is a well researched and diligently compiled reference work to audio and hi-fi that misses just about nothing. At £10.95 it is excellent value and should prove useful to anyone who feels a bit baffled by the mysteries of hi-fi technology. **NK**

**DIGITAL AUDIO  
AND COMPACT DISC  
TECHNOLOGY**  
SONY SERVICE CENTRE,  
EUROPE £16.95  
BUTTERWORTH-HEINEMANN

● Looking for a book on Compact Disc technology some years ago, I perused this one in our local bookshop - then passed it by. Reading it again I am reminded why. However, it will appeal to a certain audience and that - not unexpectedly - will comprise mainly service engineers who want real nuts and bolts information on items like Compact Disc laser sled servo-circuits with their drive waveforms and such like. This isn't a book you'll take to bed with you for a rivetting read.

It seems to me that the Sony book has grown out of comprehensive service information, with sections and chapters of technical descriptions and



optics and optical electronics of a CD player. Similarly, error correction schemes and algorithms are comprehensively covered. This sort of information is difficult to find elsewhere.

Why did I pass the book by? Mostly because it is biased heavily to Sony Products and it unashamedly propogates Sony's view of the world - something I find vaguely distasteful. Media not invented by Sony get scant mention. So the chapter on Digital Audio Recording Systems

direct drive system with the electronically controlled servo motor, the BSL motor and the quartz locked DC servo motor were finally adopted together with the linear tracking arm and electronically controlled tonearms (Biotracer). So, enormous progress was achieved since the beginning of the gramophone." That the Biotracer represented progress in LP development will be news to most people. The chapter is really about Japanese hi-fi history in general and Sony's role in it in particular.

However, while the first chapter is distasteful and misleading in its xenophobic views, it is rather peripheral to the basic aim of the book, which is to provide thoroughly detailed insights into Sony technologies that have found worldwide use (i.e. not Elcassette!). As such, the book is highly technical and very detailed. But it is also tightly aimed at one small group of professionals - primarily service engineers. For those who want a more general and balanced view of digital technologies - and hi-fi history - other books, notably by Pohlmann and Watkinson, are more appropriate.

**NK**

operating principles on Compact Disc, PCM-1600 professional recorders, DAT and such like being added to broaden appeal. This does not alter the fact that at heart it is a dry but generally detailed look at the workings of modern electronic consumer and semi-professional audio products, aimed to inform in great detail about methods of operation above all else. As such, I would describe this as a reference book for those in the audio industry who need to be able to find out in minute detail the principle of operation of various sub-systems and devices in digital audio. In particular, a whole chapter is devoted to the

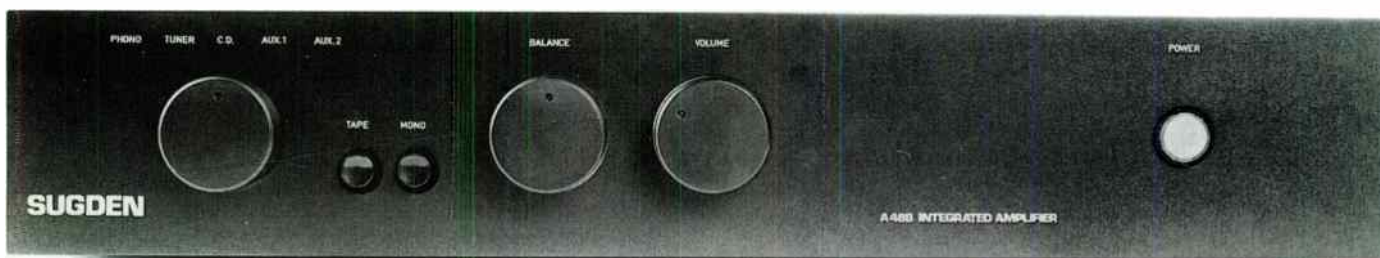
fails to mention DCC, observing that S-DAT is "currently in development" when in fact DCC is derived from S-DAT and will arrive soon. However, this is as much a reflection on the need for the book to be updated, since it also completely fails to mention Sony's own MiniDisc and ATRAC data compression system.

I note that Philips are credited with the initial development of the Compact Disc (but not the Compact Cassette), but otherwise the introductory chapter entitled A Short History of Audio Technology is enough to make any hi-fi enthusiast to see red. Of LP development Sony say "The

# SUGDEN

## AUDIO PRODUCTS

**Distinctive Hand Crafted British Products  
For The Discerning Music Lover**

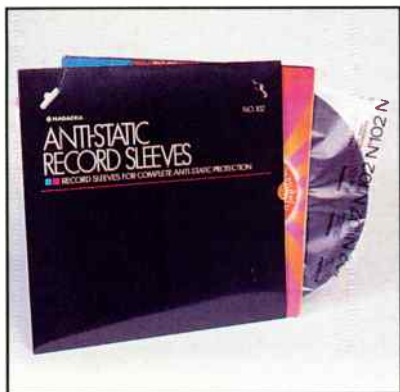


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# Hi-Fi World SPECIAL MAIL ORDER



## ANTI-STATIC RECORD SLEEVES

Translucent antistatic record sleeves from Nagaoka, according to availability. A surface treatment makes them anti-static, lessening dust attraction. This helps keep records pristine. They are supplied in packs of fifty. We suggest you regularly change sleeves in order to prevent trapped dirt contaminating records, especially after cleaning. The record label is clearly visible through these sleeves, an aid to easy identification.

**LP SLEEVES (50) .... PRICE £7.50**

## CD JEWEL CASE

To house and protect your CD.

**CD JEWEL CASE ..... £1.00**



## NAGAOKA CD CLEANING KIT

As with cassette deck cleaning kits, we don't recommend the 'cogs and wheels' cleaners and choose not to sell any of them. Tests we have carried out with a Cambridge CD-1 CD Quality Control Unit clearly show that careful manual cleaning is the most effective way of removing all types of surface contaminants without causing damage to the disc. Remember that CDs must not be scratched - even finely. Tests showed that the Nagaoka kit was the best all round cleaner. It has a

solvent and a chamois leather pad which, together, bring the CD surface back to almost as-new condition.

**NAGAOKA CD CLEANING KIT ..... £10.50**



## NAGAOKA ROLLING RECORD CLEANER

The big drawback with most record cleaners is that they fail to remove all types of dirt. Brushes pick up fluff, but they redistribute fine dust around the grooves, causing noise build up. Nagaoka's rolling record cleaner actually lifts dirt from the bottom of the groove - even fine dust. It uses a peculiar form of sticky coating on a soft foam backing. Dirt of all types - especially fine dust of the sort left by brushes - is removed completely. It is lifted from the record's surface, and no deposits are left behind. This is an effective way to dry clean a record.

**ROLLING RECORD CLEANER ..... PRICE £10.20**

## AUDIO TECHNICA GREEN CD RING STABILIZER

These are detachable green rings which are fitted round the circumference of the Compact Disc. The non-slip material allows the disc to be picked up without touching the playing side and leaving fingermarks. It also raises the disc slightly from any surface it's placed on, avoiding scratches if you don't replace it directly in the jewel box, as you should! It also adds a tiny but significant degree of mass to the outer edge of the disc, improving its stability and reducing vibration when it rotates at high speed inside the CD player. Green absorbs stray red laser light, so reducing random reflections within the disc, much like a green pen. So the rings perform many useful functions - and they are removable too! Improvements to the sound include better focussed and firmer images, plus a generally denser and richer sound.

**GREEN RING STABILIZER (5) ..... £6.50**

## AUDIO TECHNICA RECORD CLEANING SYSTEM

The Audio Technica Record Cleaning System removes both dirt and static. When you lift the pad from the record, dirt comes off with it. A tiny amount of cleaning agent inside the handle provides just enough humidity to dissolve fingerprints, oils, and film. A bottle of special fluid and pad brush are included.

**AUDIO TECHNICA RECORD CLEANING SYSTEM ..... £10.50**

## AUDIO TECHNICA ELECTRONIC STYLUS CLEANER

Scared of damaging your stylus when cleaning it? Try this amazing little device - an electronic stylus cleaner that vibrates gunge right off the tip! Powered by a small AA battery, it's a doddle to use and safe too. Just rest the stylus on its high speed vibrating brush and watch dirt get driven off automatically.

**ELECTRONIC STYLUS CLEANER ..... £19.95**



## AUDIO TECHNICA CD LENS CLEANER

Here's a product for smokers in particular. However, seeing the peculiar haze that can coat windows even when there are no smokers about suggests this clever little gadget is a necessity for one and all. It is a laser lens cleaner for your CD player, beautifully made by Audio Technica. Contained in the pack is a disc with fine brushes on it. Each brush takes one drop of cleaning fluid, then it is inserted and played. The brushes gently clean the laser lens, removing oil, grime, dust and other airborne deposits like nicotine (ugh!). Audio Technica recommend use once a month.

**CD LENS CLEANER ..... £15.30**

## AUDIOQUEST LASERGUIDE

There are many factors that can undermine the process of converting the pits on a Compact Disc into a digital signal to feed your CD player's D/A convertor. How efficiently your player's transport can send laser light into a CD and then accurately read the reflections is crucial.

The surface of the CD itself is often a problem. The clear polycarbonate may look smooth to the naked eye but viewed under a microscope it is quite rough. This leads to unwanted random refraction and reflection of the laser light, causing additional jitter on the recovered digital signal.



# Hi-Fi World AUDIO ACCESSORIES

accessory offers

Laserguide is a carefully engineered silicone based treatment which has a reflective index close to that of the CD's polycarbonate surface. It helps smooth out that surface resulting in a claimed 50% reduction in refracted stray light. It is suggested that this improves stereo depth and openness. Video Discs also benefit with a sharper picture and less noise.

Just apply to the surface of the disc surface and wipe clean. One bottle treats approximately 300 CDs.

**AUDIOQUEST  
LASERGUIDE ..... £14.95**

## LASAWAY GREEN PEN

When red laser light hits the silvered reflective surface of a disc, some of it scatters and is later reflected back off the disc edges, causing optical interference. Because green is far removed in the light spectrum from red, an opaque green coating effectively absorbs this scattered light, reducing interference signals reaching the laser and improving sound quality. The green coating is applied to outer and inner edges. It has been formulated by one of Japan's largest companies, Mitsubishi, to be harmless to the CD itself.

**LASAWAY GREEN PEN ... £7.50**

## HI-FI WORLD DRY STYLUS CLEANER

A method of keeping your stylus sharp and bright for perfect tracking without using fluid. We're offering a whole

sheet of card with an aluminium oxide micro-abrasive coating. Cut a strip off, about the size of the striker on the side of a matchbox, and draw it gently under the stylus from the back to the front. It removes the gunge that builds up. One sheet should be more than enough clean your stylus at least forty times.

**DRY STYLUS CLEANER .. £1.95**

## PIXALL MK II RECORD CLEANER

Simple in both function and design, and made in the U.K, this uses a roll of sticky tape which lifts the dust out of the record groove. Three or four passes will clean the record very effectively, and can reduce static at the same time. After each pass, the dirty length of tape can be peeled off and thrown



away, reducing the risk of any gritty particles picked up being ground back into the vinyl. When the tape roller runs out, a replacement is simply clipped in. This is one of the most effective ways of cleaning an LP.

**PIXALL MARK II .. PRICE £10.75  
REFILL ROLLER ..... PRICE £2.75**



## ON STYLUS CLEANER

Here's another simple but effective cleaning kit. It consists of a stylus brush and cleaning solution. Use carefully to keep your pickup cartridge stylus and cantilever clean.

**STYLUS CLEANING KIT .. £2.50**

## TDK CLEANING KITS

A comprehensive range from TDK for cassette decks, Compact Discs and even connectors. The CK-A1, head cleaning kit includes two bottles of fluid for heads and rubber pinch wheel, and cotton buds for applying it. The CK-TB pack has a single bottle of dual-purpose liquid.

TDK offer three cleaning pens. Each with a soft double-ended replaceable shaped tip. The Audio Head Cleaning Pen for cleaning cassette heads, the CD Cleaning Pen for removing finger marks from CDs, and the A/V Connector Cleaning Pen for polishing up audio plugs and sockets.

The CD cleaning kit contains a bottle of fluid and a cloth which



can be used for removing grime and stains. Finally, a dandy CD cleaning tool for applying the cleaning fluid and drying the CD off afterwards.

**TDK HEAD CLEANING KIT  
CK-A1 ..... £5.50  
TDK HEAD CLEANING KIT  
CK-TB ..... £4.65  
TDK AUDIO HEAD CLEANING  
PEN CP-AH1 ..... £5.00  
TDK CD CLEANING PEN  
CP-CD1 ..... £5.00  
TDK A/V CONNECTOR  
CLEANING PEN CP-CR1 .. £5.00  
TDK CD CLOTH CLEANING  
KIT CD-C2TP ..... £6.50  
TDK WET AND DRY CD  
CLEANER CD C1TB ..... £8.75**

## RECORD STORAGE CUBE

This cube has been designed by us to hold roughly one hundred LPs. It has an internal width of 37cms. Internal height is 32.5cms and depth 32cms. The cubes can be stacked or placed alongside each other to increase storage - and they can even be used as seats!

Strongly made from 15mm medium density fibreboard (MDF), the panels are milled to have strong side joints. We have specified a durable black paint finish to give it a smart, yet unintrusive appearance. The screws are self-starting, but clearance holes are pre-drilled. It comes in a flat pack with screws and Allen key for easy home assembly.

**RECORD STORAGE  
CUBE ..... PRICE £42 EACH**

**FREE!**

**20 RECORD SLEEVES WITH 2  
CUBES  
50 RECORD SLEEVES WITH 4  
CUBES  
FOR 6 CUBES,  
JUST PAY FOR FIVE ..... (£210)  
FOR 8 CUBES,  
JUST PAY FOR SEVEN .... (£294)**

## CD CABINET

Designed to match the Record Storage Cube, in the same black finish. Made of strong 15mm MDF, the cabinets can be stacked on



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each other, or on top of our Record Cubes. 400mm long, 360mm high and 150mm deep, a central shelf allows up to seventy CDs or forty two cassettes to be stored with space above for fingers to pull them out. Supplied flat-packed with screws and Allen key for easy home assembly. Price includes postage and packing.

**CD CABINET ..... £29.95**



## SORBOTHANE CD FEET

Four big, round rubber feet, 50mms in diameter and 18mms deep. Made from a soft, slightly sticky feeling form of artificial rubber known as Sorbothane, these feet have the peculiar ability

to soak up vibrational energy, due to their high internal kinetic losses. Some people go nuts with them, swearing they improve everything, from the TV to the fridge! We sell them for use (as intended) with CD players, turntables and various other hi-fi components that might be sensitive to vibration. They improve sound quality by providing a more stable platform. Well-nutty and a lot of fun.

**SORBOTHANE  
CD FEET ..... £27.95**

## AUDIOPLAN MUSICABLES

Audioplan MusiCables are rapidly gaining a reputation for high quality, hi-tech construction, using space-age materials for inspiring sound quality. The loudspeaker cables, supplied terminated with Audioplan MusiCable's unique silver plated copper 4mm plugs, are carefully braided to avoid RF interference. The three cables, LS 3.5, LS 6 and LS 12 are designed for mid-price and high-end and reference systems respectively, though since some amplifiers are designed for specific cables, check with your dealer first.

AF and Super AF interconnects, terminated with good quality gold plugs, are principally designed to as standard interconnects, while the thinner X-Wire and Super X-Wire are used for low level sources, such as with turntable to amplifier or when using a passive preamplifier. The latest cable, Digitenna, is designed to be a reference co-axial lead for aerial downloads or digital interconnect. It can be supplied unterminated, or with phono or BNC plugs. Finally, the knowledge acquired in signal cable design has recently

been adopted in power cable design, with microphonically damped mains cables of very high quality. While the Audioplan MusiCable range is not the cheapest on the market, they are some of the finest sounding around.

**AUDIOPLAN MUSICABLE**  
**LS 3.5 per mono mtr ..... £11.00**  
**LS 6 per mono mtr ..... £27.50**  
**LS 12 per mono mtr ..... £54.50**  
**AF MKIV per mono mtr ... £37.50**  
**AF MKIV 0.5 mtr pair ..... £77.50**  
**AF MKIV 1.0 mtr pair .... £100.00**  
**SUPER AF per mono mtr £52.50**  
**SUPER AF 0.5 mtr pair .. £106.00**  
**SUPER AF 1.0 mtr pair .. £140.50**  
**SUPER X-WIRE 0.5 mtr pair ..... £127.00**  
**SUPER X-WIRE 1.0 mtr pair ..... £168.50**  
**DIGITENNA per mono mtr ..... £27.50**  
**DIGITENNA per mono mtr terminated ..... £42.50**  
**PRICES INCLUDE POST AND PACKING AND MAY TAKE UP TO 4-6 WEEKS FOR DELIVERY**

## AUDIOQUEST OPTICAL LINK Z

This is a wide bandwidth, ultra high performance optical cable for digital links, made by Audioquest. The most common use is linking a CD transport to a digital-to-analogue converter. It is available in 1metre and 2metre lengths with conventional TOS-link connectors.

**OPTICAL LINK Z**  
**(1M) ..... £69**  
**(2M) ..... £99**

## AUDIOQUEST QUARTZ INTERCONNECT CABLES

A fully balanced analogue signal cable with heavy duty, gold plated phono plugs and advanced Quartz Hyperlitz cables using polypropylene insulation. The Quartz cable we have chosen from our own experience as a fine sounding type. It uses FPC-6 ultra-pure copper (99.99997%) and the plugs are welded.

**AUDIOQUEST QUARTZ CABLE**  
**1METRE LENGTHS ..... £79/PAIR**  
**2METRE LENGTHS ... £120/PAIR**

## GOLD PLATED SPADE CONNECTOR

For amplifiers with loudspeaker screw terminals, here is a heavy, duty gold plated spade connector. It has the same unique axial clamp connector as the 4mm plugs described above.

**SPADE CONNECTOR (4) £10.00**

## ARCAM RCA PHONO PLUGS

Specially made in Japan to Arcam's specification, this heavy duty phono plug will accept audiophile cables up to 7mm in diameter. The 36mm long body is nickel plated and the contacts gold plated. Superbly built, we supply in polarised pairs with one/two ring end identity to allow send/receive ends to be established to take into account directionality. These plugs must be soldered with care to cables.

**RCA TYPE PHONO PLUGS (4) ..... £15.50**



## MICHELL ENGINEERING PLUGS

Craftsmanship marks out Michell Engineering's range of gold - and rhodium plated - plugs from the competition. Simple, but elegant.

**GOLD-PLATED SIDE ENTRY BANANA PLUGS (4) ..... £10.00**  
**GOLD-PLATED SURE-LOC BANANA PLUGS (4) ..... £14.95**  
**SURE-LOC RHODIUM-PLATED BANANA PLUGS (4) ..... £18.95**  
**GOLD-PLATED SPEAKER CABLE CONNECTORS ... £10.00**

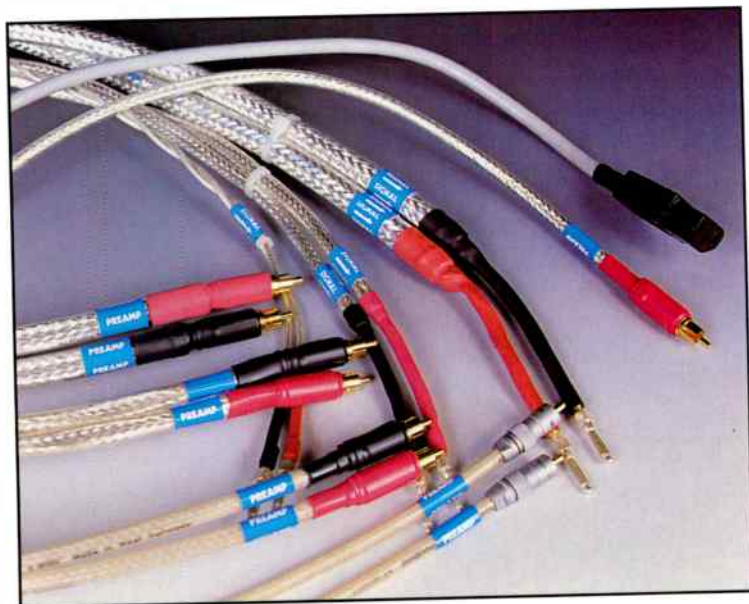
## KONTAK

Contact Cleaning Fluid  
 Kontak is an effective two part cleaning solution that removes contaminants from electrical connectors of all sorts. It is applied with pipe cleaners supplied. Clear instructions list the most sensitive contacts that need treatment in a hi-fi system, although items like fuses which are not mentioned should also be treated.

The dirt that Kontak removes is clearly visible on the pipe cleaners, demonstrating just what degree of contamination contacts have reached and what Kontak is achieving.

Users commonly express surprise at the amount of dirt and contamination Kontak removes. After application, a system regains its original life, sparkle and vigour.

**KONTAK ..... PRICE: £21.20**





# Hi-Fi World

# AUDIO ACCESSORIES

## HI-FI WORLD SPECIAL AUDIO ACCESSORIES ORDER FORM

Please send me:

- Record storage cube ..... £42.00 each
- CD Cabinet ..... £29.95 each
- Sweatshirt (state size and colour) ..... £12.00 each
- Hooded track-top (one-size) ..... £15.00 each
- T-Shirt (state size and colour) ..... £7.99 each
- Pixall MkII Record Cleaner ..... £10.75 each
- Pixall refill roller ..... £2.75 each
- Hi-Fi World Dry Stylus Cleaner ..... £1.95 per sheet
- Kontak cleaning fluid ..... £21.20 each
- CD Jewel Case ..... £1.00
- Nagaoka Anti-static record sleeves ..... £7.50 (50)
- Nagaoka rolling record cleaner ..... £10.20 each
- Nagaoka CD cleaning kit ..... £10.50
- ON Stylus Cleaning Kit ..... £2.50
- Lasaway Green Pen ..... £7.50 each
- Laserguide ..... £14.95
- Audio Technica CD Lens cleaner ..... £15.30 each
- Audio Technica Record Cleaning System ..... £10.50
- Audio Technica Green CD Ring Stabilizers ..... £6.50 (Pack of 5)
- Audio Technica electronic stylus cleaner ..... £19.95
- Audioquest Sorbothane feet ..... £27.95 (4)
- Audioquest Optical link Z ..... £69 (1m)
- ..... £99 (2m)
- Audioquest Quartz cable (pair) ..... £79 (1m)
- ..... £120 (2m)
- TDK Head Cleaning Kit CK-A1 (double bottle) ..... £5.50
- TDK Head Cleaning Kit CK-TB (single bottle) ..... £4.65
- TDK Audio Head Cleaning Pen CP-AH1 ..... £5.00
- TDK CD Cleaning Pen CP-CD1 ..... £5.00
- TDK A/V Connector Cleaning Pen CP-CR1 ..... £5.00
- TDK CD Cloth Cleaning Kit CD-C2TP ..... £6.50
- TDK Wet and Dry CD Cleaner CD C1TB ..... £8.75
- Audioplan Musicable LS 3.5 per mono mtr ..... £11.00
- Audioplan Musicable LS6 per mono mtr ..... £27.50
- Audioplan Musicable LS12 per mono mtr ..... £54.50
- Audioplan Musicable AF MKIV per mono mtr ..... £37.50
- Audioplan Musicable AF MKIV 0.5 mtr pair ..... £77.50
- Audioplan Musicable AF MKIV 1.0 mtr pair ..... £100.00
- Audioplan Musicable SUPER AF per mono mtr ..... £52.50
- Audioplan Musicable SUPER AF 0.5 mtr pair ..... £106.00
- Audioplan Musicable SUPER AF 1.0 mtr pair ..... £140.50
- Audioplan Musicable SUPER X-WIRE 0.5 mtr pair ..... £127.00
- Audioplan Musicable SUPER X-WIRE 1.0 mtr pair ..... £168.50
- Audioplan Musicable DIGITENNA per mono mtr ..... £27.50

- Audioplan Musicable DIGITENNA per mono mtr terminated ..... £42.50
- Gold plated spade connectors ..... £10.00 (4)
- Arcam RCA phono plug ..... £15.50 (4)
- Michell Engineering Gold-Plated Side Entry Banana Plugs (4) ..... £10.00
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# World favourites

## COMPACT DISC

**AIWA XC-700** £170  
Using Philips SAA-7350 Bitstream chip, this player sets new standards of smoothness and clarity at the price.

**NAD 5420/5425** £170/£290  
One of the best implementations of Japan's MASH low-bit system, offering a big, solid sound with plenty of weight.

**ROTEL RCD-965** £300  
Engagingly full of richness and life, with a natural and effortless quality; a player that transforms facsimile into reality before your ears.

**PIONEER PD-8700** £300  
Engagingly full of richness and life, with a natural and effortless quality; a player that transforms facsimile into reality before your ears.

**PHILIPS CD-850** £400  
All the finesse of top quality Bitstream, with an open, balanced and involving performance.

**ARCAM ALPHA ACD1** £420  
Offers a warm, full bodied sound with big bass.

**ARCAM DELTA 70.3** £699  
Arcam's first Bitstream player. Its refined, but powerful sound sets the standard at the price.

**MERIDIAN 206B** £950  
'Entry level' Meridian player. Detailed, but with a wide soundstage, but somewhat lacking in 'joie de vivre'.

**NAIM CDS** £2937.50  
The current talking point in the world of hi-fi. A worthy contender for the 'best CD player in the world' throne. Perfect partner for a Naim system.

## D/A CONVERTORS

**ARCAM BLACK BOX I, II AND III** £210, £260 & £360

Three solid performers that can transform a mid-price Compact Disc player with a digital output. They get progressively better as the price gets higher.

**MICROMEGA MICRODAC** £299  
Great value. Tonally very similar to the more expensive Duo BS below, only cheaper!

**DELTEC LITTLE BIT** £300  
Sets up a wide, open stage and places a captivating performance within it. Spectacular Bitstream technology at a very low price.

**AUDIO ALCHEMY DIGITAL DECODING ENGINE** £376  
Paperback sized Bitstream convertor that offers a serious upgrade for the price. Sweet, open and detailed.

**MERIDIAN 203** £495  
Impressively detailed and complex sound, if a little lacking in involvement.

**MICROMEGA DUO BS** £499  
Superb, warm, rich analogue-like Bitstream sound, from the idiosyncratic French. Latest guise suits a wide variety of convertors, as opposed to earlier versions.

**DELTEC PDM-ONE SERIES III** £1195  
Less ruthless than, but staggeringly close to the PDM-TWO. The latest version of the PDM-ONE is a two box, DAC-7 affair.

**MERIDIAN 606** £1200  
Now revamped to allow for the DAC-7 Bitstream, the earlier 606 was a fine performer, improving on the traits of the 203, but still a trifle uninvolved at times. We shall see how the DAC-7 version fares.

**DELTEC PDM-II** £2000  
Uses Philips new Bitstream DAC-7 superchip to give a performance of unparalleled drama. Frighteningly deep and controlled bass, master tape standards of fidelity. Very forthright; a trifle violent in its truthfulness. Literally - stunning!

## TRANSPORTS

**ARCAM DELTA 170** £620  
An easy yet tidy sound that underpins digital convertors well.

**MERIDIAN 200** £750  
Well built transport mechanism which lends a fine sense of solidity and detail to music. Well suited to non-Meridian DAC's too.

**TEAC P10** £1400  
Orders events in a precise manner, lessening time domain confusion and blurring. Succinct and impressively controlled.

**MERIDIAN 602** £1500  
As with the 606, this improves over the 200 transport. Good build quality and a strong sound, if a touch bland when used with the wrong DAC.

**MICROMEGA DUO** £1745  
With the new CD-ROM chips, the Duo transport has a glorious balance of delicacy, imagery and drive.

## TURNTABLES

**REGA PLANAR 2** £155  
The first of the real 'hi-fi' turntables. Excellent value for money, having been spent where it matters - the arm and the bearing. Quite transparent and lucid, it fares well against some more expensive turntables.

**SYSTEMDEK IIX-900£190(no arm)**  
Great package. A suspended turntable that is easy to set up and takes a variety of arms (the Moth arm being the obvious choice). Sound quality is surprisingly natural, if not as precise as some.

**REGA PLANAR 3** £249  
Improves upon the Rega 2 in almost every way. Sets an impressive standard that others strive to beat.

**MICHELL SYNCHRO** £301 without arm £398 with arm

Very well built turntable. Distinctive looks. Solid, stable sound, with good bass at the price. Bit lacking in involvement and detail.

**PINK TRIANGLE LITTLE PINK THING** £392  
Good-looking, neutral sounding turntable. Excellent soundstaging capacity and decent bass. Best partnered with a Rega, Roksan or Linn arm.

**NOTTINGHAM ANALOGUE SPACEDECK** £590  
Idiosyncratic turntable, with its high mass platter and distinctive looks, that is both fast and goes deep. Well partnered by the Space Arm (£380) and the Analogue Tracer II cartridge (£175) from the same company. Usually used in the context of a valve-based system.

**MICHELL GYRODECK** £659 (£801 with RB300)

Highly underrated turntable. Impressive build quality, virtually unmatched by the other British high-end manufacturers. Very solid, dry sound. Plenty of bass and good soundstaging. In some systems it can sound a little bland; in others, excellent. Better than ever with its new power supply.

**PINK TRIANGLE PT EXPORT** £676

Terrific soundstaging abilities, good bass and a neutral performance that improves upon the LPT considerably. Works with all the arms listed with the LPT, plus the SME range.

**LINN SONDEK LP12** £679  
Still one of the finest, after all these years. Brought into the 90's by the Linn Lingo (or Pink Triangle's Pink Link) power supply at £496 extra, the LP12 has always been the turntable by which all else is measured in this country. Tuneful and musical, placing dynamics above imagery in its list of priorities.

**ROKSAN XERXES** £695  
Fast, tight and clean, some have described the Roksan (especially with its Artaxerxes phono pre-amplifier) as almost CD-like in its presentation. A good alternative to the LP12.

**VOYD VALDI** £699  
Similar to the Pink Triangle, the Valdi is an expressive performer, with a deep bass that sneaks up on you. Matches Audio Innovations equipment well.

**PINK TRIANGLE ANNIVERSARY** £1175

One of the finest sounding turntables in production, the Anniversary takes the listener nearer the recording studio than almost any turntable. Suits the same arms as the PT Export.

## TO NEARMS

**REGA (MOTH) RB250** £78  
Excellent value for money. The one piece Rega arm. Lucid and graceful.

**REGA RB300** £115  
Little to beat this arm at the money. Has appeared in some outrageously expensive turntable packages without sounding out of place. Very slight softening of notes, when compared to the finest.

**ROKSAN TABRIZ** £165  
Good bass and not too tizzy for the price. Works very well in Roksans (naturally) and Pinks.

**LINN ITTOK LVIII** £560  
Great dynamics, excellent timing and delves deep into the lower registers. Latest models use refinements developed on the Linn Ekos.

**NAIM ARO** £752  
Unipivot tonearm with a seductive soundstage and a lot of character. Can resolve an vast amount of information from a groove. Works well in a Linn, its sheer freedom of movement makes it difficult to use with a more 'springy' deck.

**SME SERIES IV** £830  
As with the Rega RB-250, this is a scaled down version of SME's Series V. Superbly engineered and with a sound quality to match. The extra expense for the Series V is well justified, however.

**LINN EKOS** £1097  
A sort of 'Turbo' Ittok, the Ekos improves upon the strengths of the Tik-Tok, making it more transparent and dynamic, without becoming overtly so.

**SME SERIES V** £1247  
Probably the finest built of all pick-up arms, the V seems to have little to criticise about it, on the right turntable. Some suggest that it can sound polite; it performs (without getting in the way of the music) with grace and artistry. Strong soundstaging properties; it does not appear to have the problems associated with other arms at frequency extremes.

## CARTRIDGES

**AUDIO TECHNICA AT95E** £18  
Probably the finest starter cartridge. A little bright, scratchy and a trifle thin, it still represents excellent value for money.

**ARCAM C77** £22  
Good all rounder. Quite neutral and tidy, but a bit lacking in life. Works very well in old arms. Can be upgraded by stylii changes.

**ORTOFON 510** £30  
Even-toned, with excellent bass and good stereo imaging (all due to its solid body) for the price. Also upgradable via stylii.

**GOLDRING 1020** £49  
Sweet sounding cartridge, similar to the Ortofon in many ways, but has less clattery treble. The mid point of their 1000 series cartridges.

**DENON DL110** £70  
Moving-coil at moving magnet money. Old-ish - it has so far had quite a lengthy lifespan - this maroon tortoise-shell coloured high-output cartridge has subtle detailing and a fine delicate sweet sound.

**LINN K9** £89  
Can sound a bit forward and lacking in bass in some turntables and arms; the Linn nevertheless has a tight, crisp sound, with plenty of speed of attack. It is also quite detailed.

**ROKSAN CORUS BLACK** £110  
Very expressive and musical cartridge. Coherent and detailed, it can be a little bright in some systems.

**AUDIO TECHNICA AT-OC5** £122.95

Needs an exceptionally good front end to sound good, its resolution of detail is very good for the price. A cautious recommendation, as it can easily sound raucous and fierce in the treble.

**SHURE VST-V** £173  
Excellent tracking moving magnet cartridge. The Shure offers some of the fine detail of MC's with the brusque-ness of an MM.

**ORTOFON MC30 SUPER** £270  
Despite being detailed and analytical, the MC30 still sings a seductive song. Very solid body.

**GOLDRING EXCEL** £499  
Smooth, detailed and refined sounding cartridge. Bit relaxed and easy on the ear, but still high in enjoyment quotient.

**LYRA CLAVIS** £980  
The cartridge that currently resides at the top of the U.K. music lovers' list. One of the finest cartridges ever made. More music than hi-fi!

**AUDIO NOTE IOIIV** £1295  
A lean, clean, pick-up machine. For the Audio Note/Audio Innovations user, the Io is almost impossible to beat, short of the more expensive Io Ltd.

**ORTOFON MCS000** £1500  
The big information retriever. Can resolve more detail from the plastic than almost any other cartridge around. Slightly too analytical for some tastes.

## HEAD AMPLIFIERS

**MICHELL ISO** £393  
There really is that much in the groove. Astounding detail, rock-solid images and air and space precisely where the musicians (let alone the studio engineers) heard it. We were so impressed the Iso now has a permanent place in our reference system.

## CASSETTE DECKS

**TECHNICS RS-B665** £180  
Unusually speed stable, giving clean clear recordings; poor with metals. Plays pre-recorded tapes well. Good for piano.

**NAD 6325** £160  
One of the best at the price: superb with prerecorded tapes and makes excellent recordings. Awkward to use.

**TECHNICS RS-BX 606** £170  
Three head recording at an unbeatable price and a sound quality that is near-unbeatable at twice the price! Near-Nakamichi Nirvana for pocket-money.

**AKAI GX-52** £200  
Fine recordings from the GX head on all tape types; good replay too. Excellent all round.

**NAD 6340** £220  
Unmatched ability with prerecorded tapes and makes very stable recordings on all tape types.

**JVC TD-541** £280  
In the class of '60, or rather with the class of the Technics '606, though slightly less engaging at first listen. Serious machine for serious recording and listening.

**NAKAMICHI CASSETTE DECK 2** £300  
Especially good with metal tape, with which it makes fine recordings. Excellent with prerecorded tapes too, but slightly inferior to NAD.

## NAKAMICHI CASSETTE DECK I

£600  
Our sample had poor speed stability, but otherwise the Cassette Deck I offers a good, if somewhat overpriced, all round performance.

## NAKAMICHI CR-7E

£1500  
As cassette goes this is the ultimate - and better than the Dragon. Near perfect recordings on all tape types; replays pre-recorded tapes extremely well too.

## TUNERS

### DENON TU-260L

£1100  
Sensitive and has a clean, balanced sound. Astonishing value.

### NAD 4225

£159  
Fine, spacious presentation; smooth and easy sounding. The best under £200.

### ION SYSTEMS FMT-1

£259  
Fine minimalist tuner with good stereo, deep bass and excellent detail. Probably the cheapest 'real' tuner on the market.

### ONIX BWD1

£395 (exc power supply + lead)  
Great partner for the OA21s, as it can be powered from the amplifier, the tuner has a wonderful open clarity that belies its price.

### QUAD FM4

£399  
Revealing and airy, and a ruthless way with anything other than high studio quality from the transmitter.

### NAIM NAT-02

£853  
Little box, big money, dead good. Try and find better unless it's a...

### NAIM NAT-01

£1377  
All else is mere artifice. If you want better radio reception, go and live in the BBC's studio.

## AMPLIFIERS

### NAD 3020I

£149.95  
Well known budget classic. Its crown has slipped a bit of late, but it still represents the standard to beat. Distinctive 'NAD' sound.

### DENON PMA-350

£169.99  
The usurper to NAD's throne. Packs a lot of punch for the money. Phono stage not as strong as the rest of the amplifier.

### ARCAM ALPHA 3

£200  
Lean and lively, with an astonishing amount of detail built in; the best at this price for line-level sources and won't disgrace an LP collection.

### MISSION CYRUS ONE

£200  
Well-known British amplifier. Minimalist appearance, suitable partner for most equipment.

### CREEK 4040S3

£220  
Easy on the ear, the Creek seems better suited to LP than CD.

### PIONEER A-400

£230  
One of the most controversial and popular amplifiers today. Excellent sound, especially when partnered with extremely esoteric source components. As with the PMA-350, weakest link is the phono stage.

### ONIX OA21S

£350  
Yet another minimalist amplifier, the OA21 has the rare combination of detail, finesse and balls.

### CROFT MICRO RANGE

from £265  
Hand built range of pre and power amplifiers. Exceptional value for money. Very warm and inviting (and so is the sound).

### AUDIOLAB 8000A

£350  
Well-built amplifier with a strong following. Very neutral sound for the price.

### NAIM NAIT 2

£407  
The classic small integrated amplifier is still hard to beat. Available with or without MM phono stage.

### LINN INTEK

£398  
Since the price reduction and sonic improvements, the Intek has become a worthy competitor for the Nait, but has more power.

### NAD 1000+2100

£179.95/£289.95  
Good, all-round budget powerhouse pre/power combination. Can be made even more powerful by adding another 2100 power amplifier.

### AUDIOLAB 8000C/8000P

£325/£545  
Built like a tank. Clean, neutral sound with a slick styling to match.

### NAIM SEPARATES RANGE

A legend in its own lifetime, the Naim range has always been hard to beat, even harder to criticise. Goes from the reasonably priced NAC 62 at £405 up to the remarkable NAC 52 at £4535

### ION SYSTEMS SAM 40

from £949  
Highly expandable pre-power amplifier system. Great sound from the outset, it gets better as the system expands. Easy and inexpensive way to go active, as the circuitry fits within the amplifier.

### AUDIO INNOVATIONS SERIES 500

£990  
Sweet sounding valve integrated amplifier. Good looking, but a little system dependant.

### MUSICAL FIDELITY P-180 + CRPS

£799/£499  
Stonky power amplifiers, which are both powerful and refined (especially with the addition of the Choke Regulated Power Supply). Go well with Croft and P.S. Audio pre-amplifiers as well as Musical Fidelity's own.

### CONCORDANT AMPLIFIER RANGE

from £675  
Possibly the finest valve preamplifiers made in this country (particularly the £1800 Exquisite), the company's modifications to the Quad II also add considerable worth (and watts) to this classic mono power amplifier.

### ART AUDIO TEMPO MONOBLOCKS

£699each.  
Smooth, graceful triode-only amplifiers, that put many more expensive valve amplifiers to shame. Well built, rich-sounding and dynamic.

### DELTEC DSP-50S/DPA-50S

£725/£925  
Noel's favourite. Very clean, very clear, very neutral.

### AUDIO INNOVATIONS SERIES 200 PRE AMPLIFIER/FIRST AUDIO POWER AMPLIFIER

£305.50/£1531.50  
Pretty amplifier combination which can sound very sweet with the right components. Very lucid and transparent.

### ALCHEMIST FREYA PREAMPLIFIER

£1150  
Combining the sweetness of a valve amplifier with the solidity of solid state devices, the Alchemist amplifiers have dynamics a-plenty.

### ART AUDIO MAESTRO

£1927(PR)  
Beautiful looking valve power amplifiers. Not powerful, but very sweet and involving, especially when used in triode operation.

### JOHN SHEARNE PHASE ONE

£2398  
Pretty, valve-like amplifiers with a sweet, lucid sound. Highly suited to neutral sounding equipment.

### LINN KAIRN/LK-280/SPARK

£1295/£653/£639  
Top flight Linn amplification. A little forward for some tastes, but very detailed and designed with the future in mind.

### MUSICAL FIDELITY SA-470

£6000  
Expensive, powerful and feels as heavy as a car engine, the SA-470 appears to have no limits whatsoever (more than can be said for those who have to lift it).

## LOUDSPEAKERS

### GOODMANS MAXIM II

£90  
Fine 'giant killer' loudspeaker. Not as small a sound as would be expected from a small box. Will not compromise expensive equipment.

### GOODMANS M500

£130  
Fine budget loudspeaker. Not very subtle, but highly efficient, even-handed and dynamic. Good for loud rock.

### NAD 8225

£149.95  
Very light, open and clear sound for the money.

### MISSION 7761i

£169  
Terrific fun loudspeakers. Easy to position, easy to drive, easy to sit in front of. Slightly unsubtle at times, but highly musical.

### WHARFEDALE 505.2

£190  
Gets a bit befuddled with complex music, but can still sound excellent in some areas. Still one of the loudspeakers to beat at the price

### B&W DM610

£199  
Our latest test winner. Very competent and musical, without any nasties.

### HEYBROOK HB1S3

£249  
Powerful, efficient loudspeakers. Lots of welly, lots of bass. Enjoyable to sit in front of, if not the most refined of treble performances.

### NAD 8100

£299.95  
Fun floorstanding loudspeaker that goes deep and loud without shouting too much.

### EPES ES11

£330  
Few can match the virtues of the ES11. One of the finest at the price. Great imagery, weighty bass without becoming overpowering. A goody!

### ROGERS LS3/5A

£350  
Smooth, refined and open sound. Little real bass, but excellent soundstaging and phrasing. One of the finest classical music loudspeakers around, only matched by the Harbeths at the price.

### HARBETH HL/P3

£399  
Souped-up, bi-wirable version of the BBC design, as typified by the Rogers LS3/5A. Even better imagery and clarity, especially on vocals. Best suited for Radio 3 and Radio 4 enthusiasts, the HL/P3's lack a little in volume and a little depth to the bass.

### LINN KAN II

£439  
So called to prove that you can get a big sound from a little box. Incredibly fast, pacy loudspeakers, that give the appearance of a huge bass response, given the box size. Perfectly suited for the Linn/Naim system, may not prove so wonderful with other equipment.

### KEF 101/2

£495  
The baby of the KEF Reference series. Tells you exactly what is being played, does not mask flaws in the system prior to the loudspeakers. Very system dependent, but can sound good with the right system.

### PENTACHORD (or £990 for sub-woofer system)

£499  
Real wood finished pentagonal loudspeakers with Bandor units and no crossover. With the addition of the sub-woofer, they are capable of a superbly transparent, but deep and dramatic sound.

### NEAT PETITE

£525  
Baby loudspeakers with a sound quality that positively trounces the opposition. Tight, fast, great stereo and good dynamics. Few little boxes come close.

### TDL STUDIO I

£599  
Smallish transmission line loudspeaker. Good imagery, well focused (when positioned properly) and some of the deepest bass you can imagine. Slightly room dependent.

### PROAC STUDIO I MK 2

£612.25  
Since removing the metal dome tweeter, ProAc's Studio I has taken the lead among neutral loudspeakers at this price break. Very musical.

### KEF Q90

£649  
Very efficient, very dynamic and capable of becoming very loud indeed, the Q90s are one of KEF's finest loudspeakers.

### B&W MATRIX 805

£799  
Small, near-field studio monitor design, well suited for domestic use. Good bass from such a small box.

### NAIM IBLS

£815  
Small, floorstanding loudspeakers, best suited to Naim amplification. Can sound excellent in the right room (being fast, expressive and tight), but thin and reedy in others. Can be driven passively or actively.

### AUDIO NOTE AN-J

£799 (Copper Wired) £999 (Silver Wired)

Excellent soundstaging, a natural performance and high efficiency from these derivatives of the Snell design. Silver wiring is a worthwhile option.

### HEYBROOK SEXTET

£899  
Revealing, lucid floorstanders. Not smooth, but tight and fast-paced. Need careful partnering with ancillary equipment.

### KEF REFERENCE 103/4

£995  
Capable of showing up every detail in the recording and every defect in the hi-fi system (or the room), the 103/4 have imagery and coherence and can go very loud indeed.

### LINN KABER

£1198  
The obvious upgrade for owners of Linn Kans. Need a lot of power to drive properly. Active version also available.

### TDL STUDIO 4

£1499  
Bigger version of the Studio 1. Needs a large room. Capable of moving a lot of air. The best loudspeaker for organ music, short of the really big TDL's. Impressive, awesome and a bit frightening.

### NAIM SBL

£1426  
Highly suited to the Naim system, the SBLs are impressive, dynamic, powerful and expressive sounding, especially in active guise. May prove too intense an experience for some people!

### PENTACOLUMN

£1695  
Active column loudspeakers, again using Bandor units, that improve upon the already excellent sound of the cheaper Pentachords. Superb imagery, but a little amplifier dependant. Suits valves well.

### QUAD ESL-63

£2072  
Large electrostatic loudspeakers. Imagery and detailing second to none, but lacking in bass. An academic among loudspeakers.

### LINN ISOBARIKS

from £2190  
Few who listen to Isobariks working properly cannot fail to be stunned into submission by their gut-wrenching dynamics. A bit larger than life at times. If the Quad is an academic, the 'bariks are the Mike Tyson of the loudspeaker world.

### NAIM DBL

£6127  
Huge loudspeakers, which make even the powerful Isobarik quake in its boots (stands!). Can produce immense sound pressure levels. Not for the squeamish!

### MERIDIAN D6000

£7500  
The pinnacle of Meridian's research into active loudspeaker systems. Makes other systems seem primitive by comparison. Once set up, it becomes one of the easiest systems to use. Very controllable, the overall sound is slightly bright in some rooms, but is otherwise intensely dynamic and powerful.

### TANNOY WESTMINSTER ROYAL

£10000  
Vast full-range horn loudspeakers, which are very popular in Japan. Incredibly dynamic and detailed, with a rich sound and efficiency that lends itself toward valve amplification.

# WIN A PAIR OF PROAC RESPONSE ONE 'S' LOUDSPEAKERS

Last month, Alan Sircom was so moved by the ProAc Response One 'S' loudspeakers that he described them as "by far the best small box loudspeaker that I have ever encountered."

## PROAC RESPONSE ONE 'S' COMPETITION ENTRY FORM

Please tick the box next to the answer that you think is correct:

1) What does ProAc stand for?

- Professional Accuracy     Profound Acceptance     Professional Acoustics     Protactinium Acustatic

2) The main driver cone is made of:

- clear polypropylene     clear polyethylene     clear polychromatic     clear polystyrene

3) The tweeter is made by:

- Scandyna     Scantech     Scanspeak     Scammell

4) What stands are used with the Response One 'S':

- Podest underframe     Sound Factory light, open     RATA Torlyte     Target heavyweight frame filled column

5) Apart from the Response range, name two other ProAc loudspeakers.

\_\_\_\_\_

\_\_\_\_\_

Tie Breaker (obligatory): Make up an advertising slogan for the ProAc Response One 'S', in not more than twenty words.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Postcode: \_\_\_\_\_

\_\_\_\_\_

Daytime Tel. No: \_\_\_\_\_

Please send your entry form, completed in block capitals, by 21st August 1992 to: **ProAc Competition, Hi-Fi World Magazine, 64 Castellain Road, Maida Vale, London W9 1EX.**



**W**ith a bass performance that "bounced along correctly, without undue overhang," the One 'S' had a "seamless transition between bass and tweeter" and played music "in a manner that makes you stay awake all night, listening to long forgotten recordings . . . it is near impossible to find intrinsic faults in them."

Of the three Response loudspeakers in ProAc's range, the newly revised One 'S' is by far the smallest, about the size of an Acoustic Energy AE-1. They get bigger and bigger, until we come to the four-foot high Response Three, weighing in at about one hundred pounds. With the filled stands from Target, the Ones are still heavy, though, and they are all living up to their name, as the response from reviewers and public alike has been staggering.

All the Responses, at the top of the ProAc loudspeaker range, share the same Scanspeak tweeters, all have similar clear polypropylene drivers and all have a superb range of finishes.

You have the chance to win these remarkable small loudspeakers in our latest competition. . .

Please send your completed competition entries by 21st August 1992 to the following address:

**ProAc Competition,  
Hi-Fi World Magazine,  
64 Castellain Road,  
Maida Vale,  
London W9 1EX.**

We will endeavour to publish the results in the November issue. Audio Publishing Ltd. reserve the right to publish such entries or parts of entries as the company sees fit. No correspondence may be entered into as regards this competition and the Editor's decision is final. Employees of ProAc, their dealers and of Audio Publishing Ltd, may not enter ●

### NAIM COMPETITION

★★★ On the subject of responses, our biggest yet, with the mailbags overflowing, came from the Naim CDI competition. There can, alas, be only one winner and that is Chris Bennett of Dumfriesshire. His winning tiebreaker incorporated the letters NAIM into the slogan 'Now Analogue Isn't Mandatory'.

Chris's CDI will be installed by Scotland's biggest - and the West Coast's only - Naim dealer, Stereo Stereo of Glasgow, whose Alan Gibb will be making the 100-mile trip. "It's vital that equipment of this quality is installed by the dealer, so the customer gets full satisfaction from one of the world's best CD players."

Congratulations to Chris on his new source, and our thanks to Naim and Stereo Stereo for arranging the delivery.



## RECORD OF THE MONTH

**NONA HENDRYX AND BILLY VERA**  
**You Have To Cry Sometime**  
 SHANACHIE 1001

● I regularly complain about the slush-puppy mush that generally passes for Soul, and Soul Music, these days. Here at last is a brand new album that captures the feel of Soul and R'n'B music before it became synthesized and emasculated. The music and the performances here represent the first in a series of releases developed in association with the American Rhythm and Blues Foundation, which will receive half the royalties from this and other future releases, including exciting prospects like new discs from Darlene Love, Cissy Houston, and Carla Thomas.

What makes this album different - and special - is that it was recorded in the good old-fashioned way that was the norm in the days when Soul was truly a dominant force. Do you honestly think that greats like Otis Redding had to spend six months behind a computer-logic desk in a sixty-four track studio perfecting drum samples before he could think about laying down a vocal? Did Steve Cropper then post him midi'd guitar parts recorded in a studio on the other side of the planet to

be synched and dropped-in? Sorry, but the truth is that all the musicians actually got together in the same studio at the same time, plugged in and played like a band. What they did, albeit after a few run-throughs, was what ended up as the final product. That may be appallingly low-tech by current standards but it's funny how the music has survived and achieved classic

status in spite of its humble beginnings.

The album in question here features ten songs - any one of them capable of ripping your heart to shreds and dazzling you with its immediacy and life - all recorded in two days flat with minimal overdubs. Essentially you're hearing live, real-time performances, as near as damn it what happened when the tape machines first whirred into action.

Nona Hendryx, she of the lacquer-tastic quiff, has enjoyed a successful solo career after her stint with Patti Labelle and The Bluebells, then Labelle, and working with Talking Heads, Peter Gabriel, Afrika Bambaata and Laurie Anderson. Billy

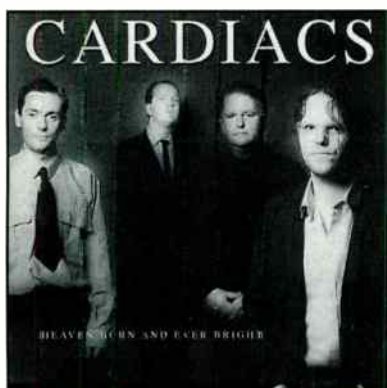
Vera is a long-standing singer, songwriter, guitarist and bandleader who has worked both in his own right and with others, most recently producing two come-back albums for Lou Rawls.

They work brilliantly together, Hendryx's raw, declamatory voice perfectly complementing Vera's mellower tones on duets like 'Storybook Children'. For me, however, Nona seems most at home when she's covering the Isley's 'It's Your Thing', vocally tearing down walls over a groove supplied by Jared Nickerson's tumid bass line and Living Colour drummer, Will Calhoun's peremptory backbeat. Her version of 'Ain't That Peculiar' is another pleaser: more considered, less raucous and decidedly better-sounding than the Chaka Khan version I've lived with until now.

In truth I don't care what song she, he, or they are singing, this album never falls short of the mark. I want to hear the rest of this series and I want to hear it now!

(Some readers have told me that they've had problems picking up Shanachie releases in their local record shops. If that happens tell your dealer that they are distributed through Koch International. I checked with the promotions company who supplied my copy of this album and they told me that you should find it in all the big stores like Tower, Smiths etc.)





**CARDIACS**  
**Heaven Born And Ever Bright**  
 ALPHABET BUSINESS CONCERN  
 ALPHCD017

● This is - er - interesting imagine the outcome if a snotty punk band fell in love with bohemian rhapsody then discovered Syd Barrett they get into the studio plug in a few fx to make the whole thing sound vaguely surreal and psychedelic along the way they add in some found sounds the resulting melange takes on a disfigured but curiously attractive persona like the nuts on acid everything on this disc assails you there's no relenting just a wall of sound that comes at you from every conceivable angle quiet interludes give way to a barrage of fuzzy guitars and echoed voices an el cheapo organ adds touches of itchycoo park and the summer of love after each track you think this has got to stop they have to do something regular recognisable and conventional now a guitar rings out a brace of power chords at lightning speed chopped short and you think here it is a straightforward speed thrash punk song then in comes that infuriating kiddy organ and the lyrics start speeding out like an auctioneer on amyl nitrate was singing at you instead of to you and so it goes on even the sixth track helen and heaven which is the only one since the beginning that has travelled at less than the speed of light is manic in its own way the lyrical content now that it's decipherable is weirder than Robyn Hitchcock and more disturbing than his brother Albert who at least didn't play kiddy organ all the way through his films this music is about as relaxing as the shower scene in Psycho it's like Pink Floyd for the nineties but there's no giant elephants floating on the cover and people won't play it at hi-fi shows thank god because it would confuse the hell out of people who only listen to Dire Straits and Mozart I'm going to listen to the supersuckers and some sonic youth to unwind and try to get my head together this record is making me as wired as the Cardiacs.



**LIGHTNIN' SLIM**  
**Blue Lightning**  
 INDIGO IGOCOD 2002 (Through Topic Records)

● The careers of Blues singers take some unusual twists and turns. Lightnin' Slim disappeared from the music scene in 1965, at the age of fifty-two, because he wrecked a truck that belonged to his mentor. Fearing prosecution he fled from Louisiana to Detroit and took a job in the motor industry. Three years later he met with Slim Harpo who invited him to join his band. Lightnin' Slim, former vanguard of swamp blues, was out of the gearbox and axle grease business and back into music.

This album was recorded in 1971 but was never released by Lightnin's then label, Excello. He played a live gig at the Marquee and this was linked to the studios (at the back of the club) where he had been recording the London Gumbo sessions LP days earlier. Backed by a band led by Pete Wingfield on piano, he works through his set of songs from the Louisiana swamps and Chicago. His playing and singing is considerably more relaxed than that of the band who never quite shake off the formality of respectful Brit rockers playing the Blues. Lightnin' himself was drifting towards R'n'B at the time and so they actually knitted together reasonably comfortably.

Three years after taping this session he died in Detroit. John Broven, who provided the sleeve notes, remarks that it is a travesty that his Excello recordings have not been regarded with the esteem accorded to those of the Chicago players like Muddy Waters. Listen to the music on this disc and you can see why they perhaps had less immediate impact and appeal, but Lightnin' Slim's more mellow and laid-back rural approach to the Blues surely merits respect equal to that given to its harder-edged urban counterparts.



**K. D. LANG**  
**Ingenu**  
 SIRE 7599-26840

● I'd never been an admirer of the much acclaimed Ms K.D. Lang . . . until now. This album has been in and out of the CD player constantly since it arrived on my desk. I've been enjoying it for so long that I quite forgot I was supposed to be reviewing it. Ingenu has shown me that not only has she got an alarmingly attractive voice but that she's also a dab hand at writing songs that you just can't shake out of your system no matter how hard you try.

All this would be less remarkable if it wasn't for the fact that the album is basically a collection of love songs - although they're thankfully free of slushy sentiment. And to make matters worse it gets within a whisker of sounding like country music far too often, although she seems to be keeping at a respectable distance from that genre for most of the time. There's still a lap steel guitar making its presence felt throughout my current favourite track, 'Save Me' but, and I never thought I'd find myself admitting this, it actually adds something to the arrangement.

Part of the reason that I've enjoyed Ingenu so much is that you can either listen to it with rapt attention or you can just stick it in the CD player while you concentrate on something else. On those occasions you let it wash over you and just delight in the beautiful sounds it makes. It has become the album I turn to now whenever I want to kick back and unwind. The arrangements are judged to perfection, colourful but subtle, skilfully fusing disparate elements like Gary Burton's vibraphone with a beat box, to give many of the songs an intriguing lack of definable character.

No matter how you're feeling you'll find a part of this album that matches your mood perfectly. If that's not enough to satisfy you then buy it simply to enjoy the near flawless production. The opening cut 'Save Me' would make a wrecked midi-system sound like it was God's own hi-fi.

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**B**ack in March, during the Camden Jazz Festival in London, the Bloomsbury Theatre rang to a variety of sounds which kept an audience thrilled through set after set for three hours. It was a collection of artists from a range of backgrounds, breaking into a new world - of jazz - and surprising everyone. Most were unrecorded in their new chosen field, but that was going to change the following week when they were booked into recording sessions at London's Elephant Studios.

Django Bates, for example, known as a composer for Loose Tubes, opted for a smaller group than his 18-piece big band *Delightful Precipice*. Tony Remy, without a recording under his own name, combined jazz, soul, afro-caribbean fusion and rock into a very heady mix; Sylvan Richardson (reputation made in *Simply Red*) brought down his six-string electric bass to prove there was a thriving jazz scene in Manchester: he's been working with Andy Sheppard's *In Co-motion* band, a name readers of our Jazz reviews will have come across.

Also around were Mark and Michael Mondesir's *Emjiem* - who can be sought out on the Polygram Acid Jazz compilation *A Certain Kind of Freedom*, but were exploring a fusion of Jazz and Rock - Mark was a long-time member of Courtney Pine's band. Last, but far from least was Orphy Robinson's band fresh from the *Annavas* project (also written for the Camden Jazz Festival) recorded by Blue Note, and reviewed in this issue.

"It's very difficult for young musicians to break out of the Club circuit and prove themselves as recording artists," say Tony Harlow and Wendy Furness of Blue Note. "Equally it's increasingly difficult for record companies to be able to gamble on giving them the chance." Sponsorship from hi-fi company Technics opened that door, by providing them with a live platform and studio sessions. Orphy Robinson, riding high on a stunning performance, couldn't wait to get into the Blue Note studio to replicate it. Preferably, he told me, to reproduce the sound - 'live' in both senses - of the Bloomsbury Theatre acoustic which he said had spurred him on throughout his performance that night.

Malcolm Steward, who was also there that night, demanded the disc that came out of it. How could we refuse?

#### **PYROTECHNICS BLUE NOTE CD PYRO 1**

● The release of the *Pyrotechnics* disc signals that Japanese hi-fi giant and patron of the arts, Technics, has

ventured into a new musical field. Previous recordings that the company has assisted in making have been classical works, including music by Prokofiev and Panufnik. The latest project, in association with premier jazz label Blue Note, showcases the work of six up and coming British jazz musicians.

Three artists who feature on the disc are debuting as leaders. The complete line-up includes bands led by vibist Orphy Robinson (see individual review), keyboard player Django Bates, guitarist Tony Remy, bassist Sylvan Richardson Jr, saxophonist Tommy Smith, and rhythm kings,



# pyromania

**In a new departure, a hi-fi company sponsored a Jazz concert and subsequent recording by famous label name Blue Note earlier this year. Now it's in the record racks . . .**

brothers Mark and Michael Mondesir.

What makes this collection of performers and music particularly interesting, accessible and enjoyable is that it avoids the stylistic clichés to be found on many jazz albums. The leaders don't use the music as a vehicle for excessive soloing and startling instrumental cadenzas. The pieces are structured and egos are sacrificed so that the whole band can make good, purposeful music.

The disc won't exclude listeners who aren't necessarily 'into' jazz. The instrumentation used exceeds that deployed for conventional jazz arrangements - for example, Orphy Robinson uses the African Kora while Tony Remy's tracks include a glockenspiel in the line-up. And the music itself shows similar eclecticism. All the players are young and their influences extend beyond the usual jazz compass, drawing upon all manner of musical directions from recent years.

The inventive and committed playing evident throughout this disc deserves to be widely heard. The current new-wavers of British jazz are

doing more than recycling worthy past movements or trying to revitalise the jazz fusion that went nowhere musically years ago. Their music is alive and kicking, and relevant. Approach it from a cerebral standpoint and it bears close inspection, or listen to it just to have fun: it satisfies both perspectives. If you regard jazz as self-referential and self-indulgent, check out this disc. It has something to say to anyone who can be touched by music ●





ripen and develop, and there are several items that stand the test of time, particularly the later material - witness the strangely strange harmonies of 'Weatherbox', the slow yet most muscular 'Einstein's Day', which is among the most ambitious songs on the generous (24 cuts, count 'em, 24!) helping of history this amounts to. More generally there's oodles of evidence that Clint Conley was a bassman of power and fluidity far above the norm; he also doubled on guitar, and he and Roger Miller did some impressive axe-strangling between them - check out the quasi-metal thunder of 'Fun World'. The other chaps involved drummer Pete Prescott, while Martin Swope was well ahead of his time with his tape and loop work. The concluding impression is that Mission of Burma went from half-hearted copyists to a second division band of fire and brimstone. Their weakest spot was their vocals, something nowhere more evident than on the closing item here, alive cover of Iggy's '1970' where the ruff 'n' tuff music simply isn't strong enough on its own to carry some decidedly wimpish and lacklustre vox. But then again successful 'crap' singers are legion (I tried to be one myself) so who's to say these lads couldn't have cracked it given another few years at the grindstone? As things stand Mission of Burma have to be regarded as one of those necessary stepping stones between musical eras. Who knows if there'd have been a Pixies or Husker Dü without the likes of this to help bridge the gap? Worthy but minor footnotes in pop's rich tapestry perhaps, but worth lending an ear to.



**DEL AMITRI**  
**Change Everything**  
A&M 395 385-4

● You'd have to be a Venusian or Townsend's Tommy not to have at least heard of Del Amitri in the past few weeks - the Glasgow born quintet have been the subject of the kind of intense media blitzkrieg usually reserved for the likes of Michael Jackson.

So what's it all about? Well, this is

fluid, musicianly music - by which I mean perfectly played, beautifully arranged, catchy stuff of the kind that was absolutely made to give MTV programmers wet dreams. There's a touch of Dylan to the vocals (credibility) all variety of musical styles and instruments (a latterday Band wouldn't be a bad comparison) and the sort of high-grade studio polish to the sound, arrangements, playing - you name it - that immediately evokes visions of videos as yet unmade: black and white film of the guys playing on a craggy hilltop intercut with scenes of beautiful women climbing into Ferraris and being driven into a Texas sunset by the various band members.

Be honest - I hate this kind of stuff - it's safe, clean, anodyne music of the sort that's custom-made for a yuppie's two-hundred quid Walkperson, his miniaturised CD system, his ear-puncturing in-car stereo. But then what do I know? Del Amitri have the kind of polish that has seduced the ears of America's silent record-buying majority. They've had a number of hits already and, on the evidence here, are poised for a good many more. What matter that the music here is lacking in any sort of danger or threat (which makes it almost impossible to believe the band was spawned in Glasgow, one of the toughest towns this side of Beirut) or that the vocals deliver such poetic gems as this one: 'Like a part-time Elvis imitator these streets I know so well/Have been pasted beyond recognition with a temporary smell.' Do what? Surely Del Amitri are laughing up their sleeves? All the way to the bank, more than likely

Still, one man's meat, as they say. It's the perfect thing to slip next to your latest Genesis, will probably sell just as well - and if it is, after all, what I like to think of as music for people who don't like music, then what the hell - you pays yer money, etc. But which one's Del?

**CABARET VOLTAIRE**  
**Technology**  
VIRGIN CD CV 4

● History - it's constantly being re-written. Was a time I was not alone in having Cabaret Voltaire pegged as purveyors of slightly po-faced electronic pop of the sort that appealed to students with funny haircuts - a slightly more dour Human League or Heaven 17, with whom they shared both a taste for the new technology as well as a common base, i.e. Sheffield, that surprising (in all



ways) fountain of musical creativity.

Boy, was I ever wrong! It turned out that the Cabs - as the faithful devotedly referred to them - were all along laying the foundations for a major style for the next decade. For, as this selection of remixed works from the period spanning 1982-1985, all too amply displays, what Cabaret Voltaire were rightly doing was paying their dues as - wait for it! - Grandfathers of Techno! No word of a lie - it's all here; the quirky tape loops, the bizarre proto-samples, the bouncy pre-Acid rhythm Sturm und Drang - you name it, the roots of Techno are clearly audible on this collection from the vaults of Stephen Mallinder and Richard Kirk. And in case anyone's in any doubt there's even a cred-boosting remix of 'I Want You' courtesy of league leaders Altern 8. It's plenty big fun, from '24-24', with its haunting, fluting melody carried by a percussion track that sounds like Hal 9000's wettest wet-dream come to life, the surprisingly perky 'Sleepwalking', the scary and propulsive 'Kino'... and much more. Why exactly these particular bits of the band's history (what about pre-'82 and post-'85?) have been chosen for revival is somewhat mysterious. But this previous non-Cab fan has been quickly converted. Check the aptly named, highly addictive likes of 'Sensoria' and you will be too. Let's all hail the Cabs - a group whose day has come again.



**An improviser doesn't necessarily make a composer; a krakaphone, however, makes a recording Jazz Record of the Year - and it's only August.**

*Simon Hopkins*



**JOHN SCOFIELD**  
**Grace Under Pressure**  
**BLUE NOTE CDP 798167-2**

● When guitarist John Scofield emerged in the early Eighties, he had a lot to live up to: as a Miles Davis sidesman, the list of his predecessors was staggering. Pretty well anyone who'd been in Miles' bands from the mid-Sixties on had become, at the very least, widely respected, and in many cases legendary. Guitarists, of course, had been Miles' hobby-horse since he'd first heard Hendrix. The odd thing about Scofield was that his playing consistently refused to bow down to what the trumpeter generally looked for: a sort of Jimi-with-jazz-chops. For all that he became loved for his forays into pan-global, orchestral, polyrhythmic, and spiritually ascetic jazz-rock, John McLaughlin's tenure in Miles' band had been one of

unfettered, post-Hendrix, post-Coltrane, feedback-and-distortion-drenched electric guitar freakouts. It provided a template for Davis' guitarists right through to the phenomenal (and underrated) Pete Cosey in Miles' late Seventies Stockhausen-meets-P-Funk supergroup, and beyond to Mike Stern in the first re-emergent Miles Davis group of the Eighties.

But Scofield's playing, like I said, remained unbowed. Clinging to his fractured, precarious bebop lines and cool Country-ish chording, Scofield defied the popularity of speed-junkie jazz guitar fans, and ironically became one of the Eighties' most admired jazz guitarists. A string of critically acclaimed and bestselling solo albums easily bridged funk, hard-bop and country blues, and amply showcased Scofield's ever-expanding harmonic and melodic horizons.

Grace Under Pressure is his third album for the reconstituted Blue Note label and its line-up surely makes it Scofield's most attractive offering to date: bassist Charlie Haden, veteran of groundbreaking dates with Ornette Coleman, leader of his own highly politicised Liberation Music Orchestra and unquestionably the finest double bassist in contemporary jazz; guitarist Bill Frisell, already pushed in this column constantly, the non-guitarist's guitarist, anti-guitar hero, Naked City-er etc; drummer Joey Baron. Frisell's sideman and fellow Naked City cohort, pretty much the most exciting drummer in America at the moment, and undoubtedly the cutest. Plus a discreet three-piece horn section on five songs, exquisitely arranged by big-band composer and leader (and the true inheritor of Gil Evans' mantle), Mike Gibbs.

All of which helps to make this session such a huge disappointment. Scofield and Frisell have locked axes before, on the two Bass Desires albums, but despite Grace's even finer rhythm section, they never really burn the way they did on those sets. The central problem remains the writing. Scofield has been a constantly surprising improviser, but his composition has never been anything but by-the-numbers, and even this stellar group is held back by largely uninspired writing, much of which (even now) still sounds like the composition exercises of a Berkeley graduate - which Scofield is.

Some of the ballad-writing ('Honest I do' in particular) is genuinely lovely, helped enormously by Gibbs' horn parts. But the uptempo

numbers rarely let the players indulge in the crash-and-burn we've come to expect from their own records.

Grace Under Pressure is undoubtedly the sort of record Scofield wants to make, and more power to him for assembling such a group of consummate taste. But this guitar and improv freak, for one, was left begging for more. Question is, are there any out-takes out there? Anyone? The rare moments of epiphany (Frisell and Baron making a nice racket in the middle of 'Scenes From a Marriage' for instance) make that a mouth-watering possibility.



**KRAKATAU**  
**Volition**  
**ECM1466**

● By contrast, the relatively unknown Finnish group Krakatau, on their third studio outing (their first widely available) deliver just about the most adventurous and consistently satisfying jazz album of the year, and one which might just, with a fair wind and with any luck, set the agenda for European jazz in the Nineties.

The founder, focus and leader of the group is guitarist and composer Raoul Bjorkenheim, a Finn who spent his early years in Los Angeles, and who came to jazz, somewhat elliptically, via Jack Bruce, Jimi Hendrix and Frank Zappa, eventually taking the music seriously enough to study with Mick Goodrick (one-time teacher/guru to the American fusion superstar Pat Metheny) but always wary of the tendency in jazz (and particularly in jazz-rock) to sublimate raw emotion with technical facility, a cardinal and venal sin in the rock music world of his youth.

Bjorkenheim first heard the way to marry the improvisational intensity of jazz to the visceral onslaught of rock as a sidesman in drummer Edward Vesala's big band Sound and Fury, and formed Krakatau as a satellite to that group. Indeed, Vesala originally played drums in the smaller group. He is joined in Krakatau's line-up by three

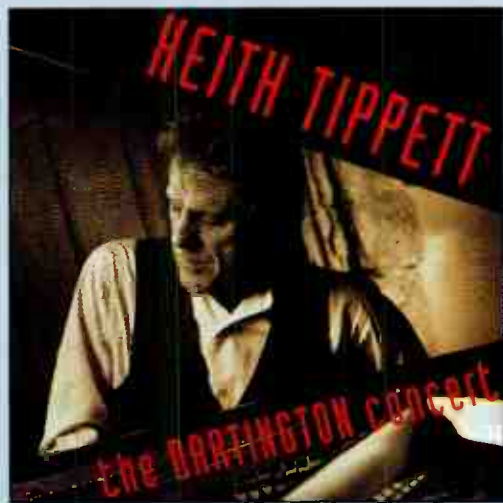
other Vesala alumni. Tenor saxophonist Jone Takamaki was originally inspired to play jazz by hearing the 'Triptykon' trio of Jan Garbarek, bassist Arild Andersen and Vesala, and his playing on Volition strongly recalls early Garbarek in its sometimes plangent, sometimes guttural, tone.

Takamaki also plays an eight-foot copper organ pipe with a baritone sax mouthpiece, poetically named a krakaphone, and evidently enjoys it: he plays a constant drone on it throughout the eight-and-a-half minute epic 'Little Big Horn' but admits 'This is the short version. Some day I'd like to play it for several hours, to shake off the last vestiges of conscious effort' (i.e. probably pass out).

Double bassist Uffe Krokfors has been a bebopper from the very beginning of his musical life, but was encouraged to reach beyond the technical confines of that music while in Vesala's band, with whom he played on 89's incredible 'Ode to the Death of Jazz'.

By contrast, drummer Alf Forsman has been a rock kid throughout his noisy career, and at the time of recording Volition had been playing 'jazz' only months. Bjorkenheim met Forsman when an earlier Krakatau supported the Finnish psychedelic rock group Sielun Veljet (with whom Alf was drumming) in 1988. All of which is purely biographical, but gives a fair impression of the health of Finnish music: can anyone imagine Derek Bailey supporting Ozrick Tentacles? Would anyone want to?

The music that these four fellow travellers make is as diverse as their background, and reflects all their interest in the music of the world. Over the course of seven songs they delve into, and beyond, Gothic Rock, free improv, huge drones that recall the overtone singing of Tibetan monks, and Punk/Metal earth-scorching. (There's more aggression in the 2'16 of 'Bullroarer' than in the entire recorded output of Led Zep.) And throughout it all, above Forsman's shifting, never-settled drumming, Takamaki's squalling saxo- and kraka-phonics and Krokfors' gut-wrenching, malevolent bass, Bjorkenheim wields blistering, brilliant, transcendent guitar. If Krakatau don't set the agenda for jazz in general, then Bjorkenheim's will surely (eventually) be the sound that aspirant improvising guitarists will give their soul for. Volition: huge, sinister, epic, inspiring; the jazz record of the year, and it's only July.



*So much stuff, and already I've written too much about Scofield and Krakatau, so on with a quick round-up of other recent goodies.*

**RALPH TOWNER**  
**Open Letter**  
ECM 1462

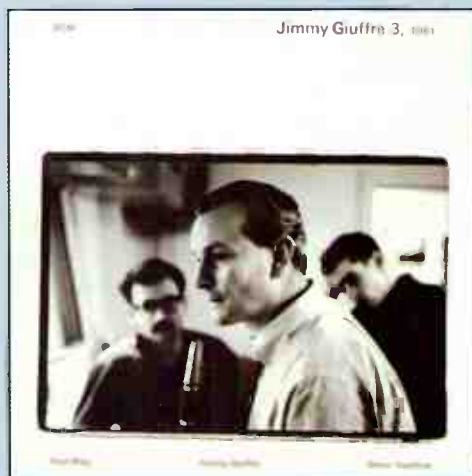
● More guitar! The American Ralph Towner is one of a long line of great guitar players to emerge from the ECM stable: Abercrombie, Pat Metheny, Bill Frisell and, of course, Bjorkenheim were all in there along the line. Towner, however, has remained an acoustic guitarist, concentrating on the Classical and 12-string instruments and specialising in a highly complex contrapuntal solo improvising style which draws as heavily on Classical music and European folk as on the American jazz tradition. In many ways the archetypal ECM guitarist, the label's perfect complement to Keith Jarrett and Co. On Open Letter he plays eleven pieces, on which he accompanies himself on synthesizers (never naively, either) and is joined by drummer and Weather Report alumnus Peter Erskine. Together they run the gamut from gentle introspection ('Sigh') to about the most blistering you'll ever hear an acoustic guitarist ('Infection'). Certainly not groundbreaking, but highly recommended for attentive listening.



**KEITH TIPPETT**  
**The Dartington Concert**  
EDITIONS EG 2106-2

● A single, nigh-on fifty-minute solo improvisation by the great British pianist recorded live at the Dartington Summer School last year, and dedicated to (and undoubtedly inspired by) his friend and former colleague Dudu Pukwana, who'd died just a few days earlier. Tippett remains one of those rare artists who comfortably straddles modernist abstraction and late romantic consonance. Indeed, he easily swings between the two in the course of a single improvisation, and it's perhaps this which has made him at once a musicians' favourite (with a CV running from King Crimson to Andy Sheppard) and yet unknown (or only heard of) to a large audience. The chief crime of our age: to resist pigeonholing. The Dartington Concert is by turns furious and melancholy, bewilderingly complex and breathtakingly placid.

A powerful statement from a genuinely great musician. Check it out.



**JIMMY GIUFFRE 3**  
**1961**  
ECM 1438/9

● And a brief mention for a re-issue which really deserves more space than this entire column. 1961 comprises two long out-of-print records, Fusion and Thesis, by a group that, in its own small way changed jazz history: Jimmy Giuffre, clarinet; Paul Bley, piano; and Steve Swallow, bass. At the other end of the spectrum from the fury and energy of the Sixties' 'New Thing', the two albums nonetheless become a blueprint of introspective, intellectual, romantic, improvised music. It's appropriate that ECM, of all jazz labels, should reissue them. Truly prophetic stuff, thirty years on, this sounds more contemporary than much music recorded in the Nineties.

# Classical

**From Thomas Tallis to Carl Philipp Emanuel Bach, the emphasis this month is on early or - if you prefer - pre-classical music. There's some fine Purcell playing, and some superlative Vivaldi, and contributing to the success (or failure) of the recording, the computer studies department at the University of Bradford.**

*Peter Herring*

**CARL PHILIPP EMANUEL BACH  
Flute Quartets in A minor, D Major, G Major Wq93-95/  
Fantasy in C Major**

Nicholas McGegan, flute;  
Catherine Mackintosh, viola;  
Anthony Pleeth, cello;  
Christopher Hogwood, fortepiano  
L'OISEAU-LYRE 433 189-2  
(ADD/53.26)

● Of the musically-gifted sons of Johann Sebastian Bach, it is the reputation of Carl Philipp Emanuel which has grown over the ensuing two centuries. Though craftsmanship prevails in his compositions, there is also much that is inventive - often surprisingly so - and unpredictable. The slow movement of the D Major quartet recorded here is a fine example of a fertile imagination at work within the established confines of a chamber music form.

C.P.E. Bach seems to have enjoyed a comfortable and congenial life. For no less than twenty-eight years he was in the employ of King Frederick II of Prussia, an avid music-lover and a flautist of some accomplishment. Bach may have complained about the endless routine of having to accompany his flute-playing employer, and being required to maintain a flow of occasional pieces designed to show off the King's talents, but the length of time spent in the monarch's service suggests there must have been compensations.

The flute quartets presented here date from the last year of C.P.E. Bach's life, 1788, some twenty years after he had succeeded his godfather, Georg Philipp Telemann, as what would now be described as 'composer in residence' to the city of Hamburg. It was his role at Hamburg, rather than his time at the Prussian court which saw Bach's output broaden to embrace sacred music, concertos and his historically important and influential contribution to the early symphonic repertoire.

Finely-fashioned, well-proportioned pieces, the Quartets Wq93-95 may well have been C.P.E. Bach's last instrumental compositions and the accompaniment of violin, cello and fortepiano makes for some unusual sonorities. They are superbly played in this reissue from 1977, and recorded in exactly the right kind of intimate acoustic. But the gem here, for me, is the C Major Fantasy, a

work whose virtuosity, flair and imagination reveals why C.P.E. Bach was one of the most feted keyboard players of his age (interestingly, the piece is roughly contemporary with Mozart's superlative C Minor Fantasy K475). Hogwood's playing here is spellbinding, as he secures a dazzlingly wide dynamic range from the fortepiano, along with crisp articulation.

**BEETHOVEN**

**THE PIANO SONATAS Vol.8**

**Nos. 24, 25, 26 'LES ADIEUX' & 28**

**JOHN LILL**



ASV

*Quicksilver*

**LUDWIG VAN BEETHOVEN  
Piano Sonatas No24 in F sharp minor Op78; No25 in G Major Op79; No26 in E flat Major Op81A 'Les Adieux'; No28 in A Major Op101**

John Lill, piano  
ASV QUICKSILVA CD QS6062 (ADD/61.20)

● John Lill's way with Beethoven has always been highly individual. In some ways, his approach to the piano sonatas is on a par with that of Klemperer in the symphonies: clarity above beauty of sound; an emphasis on architecture and well-defined detail; and, perhaps recalling those portraits of the composer which suggest the most brusque and grumpy of characters, a distinct absence of charm. The effect of this on the two shorter sonatas here, Nos24 and 25, is difficult to come to terms with, especially the delightful finale of the Op79. 'Les Adieux' is much more successful, the playing concentrated, thoughtful and compelling, but somehow all a little too clinical. Listen to Emil Gilels, for example, on Deutsche Grammophon and you will hear how it is possible to have both authority and affection.

To his credit, Lill does challenge preconceptions about Beethoven playing; nothing about his cycle of the sonatas, which was originally produced for the Enigma label in the late Seventies and early Eighties (these recordings date from 1977, 1978 and 1981) is routine or suggests someone merely going through the motions. Lill does ask questions, which is perhaps why the Op101 is the most successful performance here.

The clean articulation and careful precision of Lill's playing is enhanced by the bright, clear sound, which has an

EDITIONS DE L'OISEAU-LYRE

**C.P.E BACH**  
*3 Quartets*  
*Fantasy in C*  
Nicholas McGegan · Catherine Mackintosh  
Anthony Pleeth · Christopher Hogwood

impressive presence, if a degree of over-emphasis in the bass. The hiss level, too, is in places higher than might be expected in tapes of this vintage.



**CLAUDE DEBUSSY**  
**Cello Sonata**  
**ERNŐ DOHNANYI**  
**Cello Sonata in B flat minor**  
**Op8**  
**FRANK BRIDGE**  
**Cello Sonata in D Major/Two**  
**Short Pieces: Meditation;**  
**Spring Song**  
 Bernard Gregor-Smith, cello; Yolande Wrigley, piano  
**ASV CD DCA796 (DDD/67.31)**

● A feast of fine cello playing from Bernard Gregor-Smith, best known for his work with the Lindsay String Quartet but here partnered by his wife, Yolande Wrigley, an excellent player in her own right. While the Debussy sonata is staple fare of cellists, the Dohnanyi was new to me. Above all, however, the attraction for me was the Bridge sonata, a work of gripping intensity, charged with the emotions of bitterness, sadness and anger that Bridge, an avowed pacifist, must have felt at the height of the First World War. The sonata dates from 1917 and is in two cogently-constructed, immensely expressive movements. It is difficult to imagine its yearning cantabile or the fiery passion of its closing pages being played with more sensitivity or understanding than here. And how well Yolande Wrigley combines in the wonderfully subtle piano part.

Bridge, who played viola, was one of the foremost chamber music players of his time and his love of the genre, and his deep understanding of it, bore fruit in a number of valuable chamber compositions of which this is one. His quartets and trios similarly reward exploration.

The Debussy sonata is one of three he wrote, all intentionally French in character and with more than a nod towards the rococo style of the 18th century. Yet the writing is lean, with translucent textures devoid of ornamentation. The three movements are titled Prologue, Serenade and Finale, with the middle movement additionally described by Debussy as 'Pierrot angered by the moon', a clear reference to the commedia dell'arte tradition of two centuries earlier - except the music

could hardly be more strikingly original.

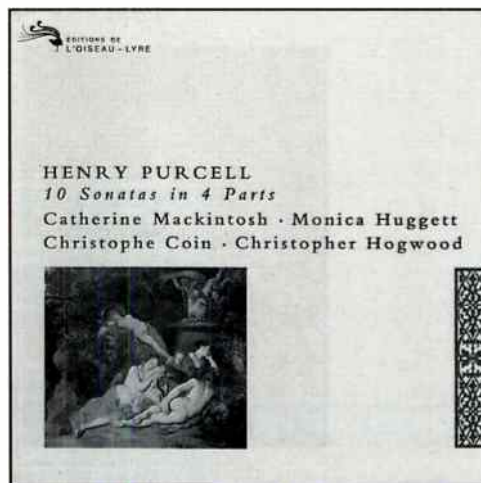
The stark, fantastic world of the Debussy is in sharp contrast to that of the overtly virtuoso sonata by the Hungarian, Ernő Dohnanyi, although they do share the same lucidity of texture. The elliptical suggestions of the Debussy are here replaced by something altogether more straightforward and the contrast has been well judged. The Dohnanyi also allows Bernard Gregor-Smith to demonstrate the full range and command at his disposal and the appeal of this recording is further enhanced by the inclusion of two delightful Bridge miniatures and a vivid, rich, well-balanced sound.

**HENRY PURCELL**  
**Ten sonatas in 4 parts**  
 Catherine Mackintosh, violin; Monica Huggett, violin, Christophe Coin, bass viol; Christopher Hogwood, chamber organ and spinet  
**L'OISEAU-LYRE 433 190-2 (ADD/62.08)**

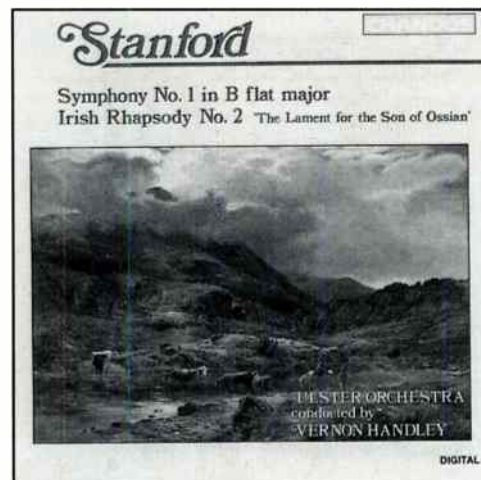
● Purcell's mistake was probably being born English. Even when there is so much interest in 'early music' of the Baroque period and before, the music of Henry Purcell remains woefully neglected in his native land. Go to France or Spain and you will find him as revered as J.S. Bach or Handel. 'Twas ever thus.

In terms of recording, Purcell's sacred music and stage works are adequately represented in the catalogue, as are his 'stage spectacles'. There is a choice in his one complete opera, the splendid 'Dido and Aeneas' and a reasonable selection of his songs, musical jewels whose word-painting is on a par with Schubert. But his considerable output of instrumental music has been almost overlooked by ensembles determined to otherwise shed light into every corner of the Baroque repertoire. Thankfully, there are now those determined to redress the balance; Christopher Hogwood, who appears here, was an early advocate of Purcell and the cause has now been vigorously taken up by Robert King in his series for Hyperion. On Chandos, the Purcell Quartet has been exploring the riches of the trio sonatas but its leader, Catherine Mackintosh, is also involved - like Hogwood - with this Oiseau-Lyre reissue from 1979 which, at the time of its first appearance, probably earned the description 'pioneering'.

Essentially, the Purcell sonatas are the English equivalent to those of the Italian, Archangelo Corelli, a meeting-point of the best of the Renaissance



notion of 'consort music' and the glories of the new 17th century French and Italian styles. The playing of them here could hardly be more authoritative or, indeed, affectionate, from a combination of four of the finest exponents of music of this period. The recording is in the natural, unforced style typical of L'Oiseau-Lyre ever since the label was founded, but remastering does betray some background rumble which must be attributable to the location - Christ Church, Flood Street - in the heart of London. It does nothing, though, to interfere with the pleasures of such masterly Purcell playing.



**CHARLES VILLIERS**  
**STANFORD**  
**Symphony No 1 in B flat**  
**Major/Irish Rhapsody No 2 in**  
**F minor Op84 'The Lament**  
**for the Son of Ossian'**  
 Ulster Orchestra; conductor, Vernon Handley  
**CHANDOS CHAN9049 (DDD/61.49)**

● After its successful and often revelatory explorations of the music of Arnold Bax, under the baton of the late Bryden Thomson, the Chandos label is exploring the music of another neglected composer whose music was infused and frequently inspired by things Celtic. In this instance, however, unlike Bax who was Celtic by adoption, the composer in question was Irish through-and-through. But it was while he was studying Classics at Cambridge that the

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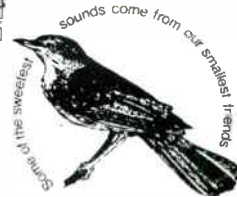
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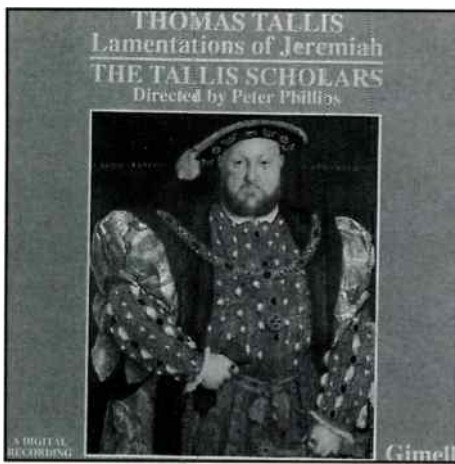


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**THOMAS TALLIS  
Lamentations of  
Jeremiah/Motets/  
Antiphon: Salve  
intemerata**

The Tallis Scholars; director, Peter Phillips  
**GIMELL CDGIM025 (DDD/  
67.36)**

● Though this is the third recording by the Tallis Scholars of music by Thomas Tallis it is the first they have made of music by this composer for six years. It is surprising that Peter Phillips and his colleagues have not tackled the settings of the

outstanding musical gifts of Charles Villiers Stanford fully emerged. He was already being noticed as a composer when he went to complete his musical studies in Germany. It was while in Leipzig that Stanford heard of a competition for a new symphony being organized by the administrators of the Alexandra Palace concert hall in North London. He entered, came second and won £5 for his trouble. The work itself was not actually performed until three years later, in 1879, after which Stanford put the work to one side and never even sought its publication. (It should be added that the winning entry, and its composer - Francis William Davenport - suffered much the same fate.)

Whether Davenport's composition deserved its fate, I cannot say, but on the evidence of this magnificent recording, persuasively conducted as ever by Vernon Handley (when will this fine conductor be granted the full recognition he deserves?), the twenty-three-year-old Stanford under-estimated his achievement. His First Symphony emerges as a boldly ambitious, confident work, predictably derivative in some respects - the second movement unashamedly echoes the bucolic Landler style of Schubert - but with an unmistakably individual character, too. It is unpretentious, well-orchestrated, delicately coloured with shades of Irish folksong and has some fine melodies.

The same can be said of the Second Irish Rhapsody, which comes from the opposite extreme of Stanford's career, when he has been established as major figure in the musical teaching establishment for some twenty years and been knighted for his achievements in that field. He completed the score in February 1903 and dedicated the work to the conductor Willem Mengelberg who conducted the first performance in Amsterdam three months later. Yet, despite its many qualities, it never attained the popularity of the First Irish Rhapsody, though its brooding, sombre mood may have something to do with that. Unlike the symphony, which just has the flavour of Irish folksong, the Rhapsody makes full use of specific Irish melodies but, despite the subtitle, offers no detailed programme. One isn't needed; the potent music of this evocative lament is sufficient to spur the imagination.

Lamentations before, as they do count among the great glories not only of Tallis's output of Tudor church music in general. Unlike some of their more esoteric issues of late - the revelatory disc of Heinrich Isaac, for example - the Tallis Scholars here face some formidable competition and I have to say that, notwithstanding the usual polish and purity of tone and blend, I do prefer other ensembles in this work, most especially the Hilliard Ensemble on ECM, for the greater intensity they communicate. For once, there is just something a little bland about the Tallis Scholars here.

The selection of motets, like the Lamentations, the work of the mature Tallis, is better-served and there are some jewels to be found here: 'O sacrum convivium' and 'In manus tuas' are just two examples. But the real interest of this issue, especially for students of Tallis and of Tudor church music, will be found in the votive antiphon 'Salve intemerata', written in the composer's youth to a somewhat rambling and therefore challenging text and thought to be the longest single movement in the Tudor repertoire. The control and technique of the singers in this majestic span of music can only be admired.

'Salve intemerata' was written during the Catholic period of Henry VIII's reign; the Lamentations belong to the Elizabethan era when Catholicism was being ruthlessly suppressed and it is possible that Tallis saw in the texts a resonance beyond the biblical context. It has also been suggested that, like certain

works of Tallis's contemporary, William Byrd, the Lamentations were written for private, and potentially dangerous, services held by loyal Catholics. Perhaps that is why the detached approach doesn't work here and something a little more passionate, such as offered by the Hilliard Ensemble, is wholly appropriate. The recording, I should add, is up to the usual high standards of the Gimell label.

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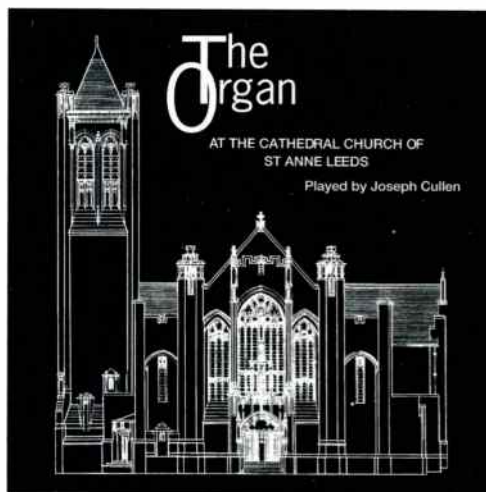
Joseph Cullen, organist  
**FOXGLOVE RECORDS FOX026CD  
(DDD/75.18)**

● The object of interest in this recording is not the programme but the instrument it is played upon, a pipeless computing organ developed at the University of Bradford, built by a company in that city, and installed in St Anne's in 1988. According to the booklet note, the instrument "computes in real time the sounds of pipes in speech from tables of numbers held in computer memory." Any wiser? Me neither. I can add that microprocessors and circuits within the organ jointly perform over 20 million calculations in every second of playing time and the digital output is then metamorphosed, into audible sounds which are reproduced through specially-designed loudspeakers, in the case of St Anne's located in the sanctuary at the east end of the nave. The organ was specifically tailored for this church and its acoustic.

It is, without question, an impressive and convincing result, though I'm no organ specialist and wouldn't attempt to analyse the finer points of the sound. It isn't grandly overwhelming - that doesn't seem to have been the intention in designing the instrument - but it is sweet-toned and full of colour, which is more than I can say for the computerised pianos I've encountered.

In concentrating on the instrument, the sleeve note reveals nothing about the performer, Joseph Cullen, which is a pity because he not only plays well but contributes two very good transcriptions to a programme that ranges from the Renaissance to Herbert Howells. Cullen's transcriptions are of Samuel

Barber's mournful Adagio and of Ravel's Pavane pour une Infante Defunte. Inevitably, there are two pieces by J. S. Bach, but it is good to see Sweelinck represented, too. An arrangement of Elgar's Imperial March is included and the recital ends in majestic style with Widor's Marche Pontificale, from the Organ Symphony No.1. Fine recorded sound makes for a recording enjoyable for more than its scientific interest, though I feel a more expansive booklet note would have added to the appeal.



# Classical

## RECORD OF THE MONTH

Who was Vivaldi, someone asked me the other day, which at first struck me as strange since the man had broken into the charts with what has become by far the best known work of 18th century music. On the other hand, why should you know any more than that he was responsible for the 'Four Seasons'? He was, however, rather more than a musical equivalent of Ian MacCaskill, and rather more than the composer whom Stravinsky, in one of his more irreverent moments (of which there were many) accused of having written the same concerto 500 times.

Antonio Vivaldi was born into the land of the violin - most probably in Venice - and was the son of a leading violinist. He certainly spent his youth in Venice and studied with Giovanni Legrenzi, organist and choirmaster at St Mark's, where he was subsequently employed as a violinist. In 1703, at the age of twenty-eight, he was ordained a priest, acquiring the nickname *Il prete rosso* (the red priest) because of the colour of his hair. It is believed that Vivaldi also suffered from asthma and indulged in some un-priestlike activities, and it is likely that the former was the excuse but the latter the real reason for his being adjudged incapable of saying Mass. Ironically, that ruling may have had a profound influence on the history of music: had he remained bound to the church, the chances are Vivaldi would have written mainly sacred music. Instead, he was now forced to take a post where the principal requirement was for instrumental music and this led directly to his output of some 450 and more concertos for diverse instruments (the majority, though, for violin).

Venice had four large schools-cum-convents devoted to the welfare and education of young girls who were orphaned, illegitimate or from poor families. In 1704, Vivaldi joined the staff of one of them, the Ospedale della Pietà, which was known for the quality of its orchestra and for cultivating a number of exceptional soloists. In 1709, Vivaldi was appointed head violin teacher at the Pietà, being appointed its

Maestro di concerti seven years later, a condition of which was that he compose no less than twelve fresh concerted works each month for the use of the school's pupils.

Vivaldi maintained his connection with the Pietà even after his fame had taken him to Germany, France, Austria and The Netherlands. He is believed to have died in Vienna in 1741 and, like Bach (for whom Vivaldi was a model in many respects), his music was almost wholly neglected for over a century.

Now, the record catalogue sags under the weight of Vivaldi recordings and it does take something a bit special to spark fresh interest in his output. But that is what is achieved by the new issue from Collegium Musicum 90 on Chandos, a selection of double concertos written for the star pupils at the Pietà. Incidentally, as we began with the Four Seasons, I should add that the director of Collegium Musicum 90, Simon Standage, is also the soloist in what remains one of the two or three very best versions of that over-recorded work, that by Trevor Pinnock and the English Concert on Archiv.

### ANTONIO VIVALDI

Concerto in C Major for 2 violins RV505/Concerto in D minor for two oboes RV535/Concerto in A minor for 2 violins RV523/Concerto in C Major for oboe and 2 violins RV554/Concerto in G Major for 2 cellos RV531/Concerto in D Major for 2 violins RV511  
Collegium Musicum 90 (Simon Standage, violin and director; Michaela Comberti, violin; Anthony Robson, Catherine Latham, oboes; Jane Coe, David Watkin, cellos)  
**CHANDOS CHACONNE CHAN0528 (DDD/64.58)**

★ Vivaldi's output of double concertos - those surviving, at least - numbers around forty-five of which some thirty-four are for like instruments (two violins, two cellos and so

forth). No less than twenty-five are for two violins, Vivaldi's own instrument, but the importance of the double concerto, not only to Vivaldi but in general, was already declining during Vivaldi's period as Maestro at the Pietà, commensurate with the growing preference for solo concerted works. Vivaldi's own Op3, *L'Estro Armonico* was a major contributor to this trend. Yet, there is no want of inspiration in the concertos recorded here; indeed, one of the pleasures is appreciating how skilfully Vivaldi uses the two instruments, in a statement-answer fashion; or in parallel; or simultaneously in counterpoint (he was a better contrapuntalist than he is usually given credit for). On other occasions, one instrument seems to accompany the other with broken chords or scales.

Of the six concertos here, three are for two violins, another is for two violins and oboe, another for two cellos, and the last - and by far the most unusual - for two oboes. With its slow, solemn introduction, this is surely a pure 'concerto da chiesa' (church concerto). The dialogues between oboes and strings in the fast



movements of this work are sheer delight.

But I can say that of this whole recording, the sixth made by Collegium Musicum 90 for Chandos's 'early music' Chaconne label. Previous issues include three volumes of Telemann, Handel's Messiah and a Bach/Vivaldi collection. The playing here is absolutely outstanding, assured in its technique, precise in its rhythms, fresh, fluent and full of brio. It is enhanced by first-class recording, engineered by Richard Lee in St Peter's Church, Morden, Surrey. The whole effect is just right: everything focused in a lively acoustic. An object lesson in good recorded balance and, overall, a superlative presentation. How well an issue such as this demonstrates that there is a lot more to Vivaldi than the Four Seasons.





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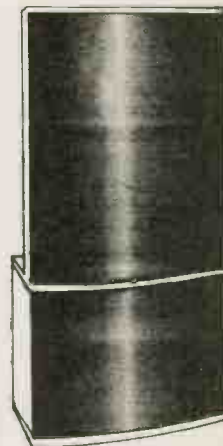
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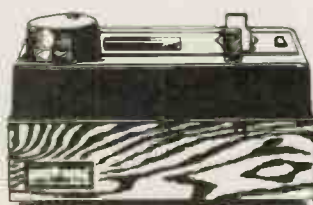
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**FST20P** Ideal for arduous loads & bi-amping £8.95 mtr  
**Rotel** good general purpose cables  
**SUPRA 4** Stranded ideal for long runs £3.25 mtr  
**Exposure** cable-system dependent, but can sound marvellous used properly £2.95 mtr

## HEADPHONES

Keep the telly out, the sound in, and the neighbours happy!  
**Sennheiser** The premier name in headphones. **HD450II** a great all round performer £39.95  
**HD540II** Reference quality at an affordable price £99.95  
**HD480 classic.** New version of an all time great £59.95  
**Audio Technica** Japan's leading electroacoustic manufacturer.  
**ATH611** punchy dynamic sound £49.95  
**ATH70** wide range electret condenser £189.95

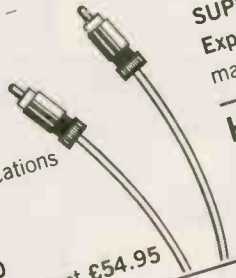


## GETTING IT TOGETHER

And keeping things that way ie accessories, stands, interconnects, and other necessities of hi-fi life. (a small selection from our large stocks)

## INTERCONNECTS

Audioquest Comprehensive range of superb interconnects - ideal for Arcam and British gear.  
**Topaz** 1m 2PL-2PL Interconnect £42.95  
**Ruby**-Very clean sound stage - 1 mtr £59.95  
**Quartz** The interconnect for CDs 1 mtr £89.95  
**Furukawa** Optimised interconnects for specific applications  
**FD1010** - CD to amp 1 mtr £92.50  
**FA2010** - Balanced analogue inter link £105.00  
**FV1010** - Digital link CD transport - DAC £55.00  
**Isoda** Unique hybrid metal cons **HC05** 1 mtr interconnect £54.95



## LOUDSPEAKER STANDS

You need a strong stable platform if your speakers are to sound of their best. Below is a small selection from our extensive range.



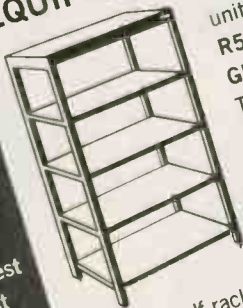
**Partington** rigidly welded steel supports  
**SAM** series, 30, 50, or 60cm high £59.95 pair  
**Dreadnought** series 20 or 24" tall £139.95 pair  
**Target** Very large range available - phone for prices

## OUR NO QUIBBLE GUARANTEE

At Sevenoaks we are committed to service. All our equipment is fully guaranteed and serviced by ourselves in our own workshops. For a small payment you can extend our standard guarantee to three or five years as you choose. Our charges are extremely modest and, we believe are amongst the lowest in the business. Details of our unique No Quibble Guarantee are available at any of our branches.

**You get it together, we keep it together.**

## EQUIPMENT CONSOLES AND RACKS



**Alphason** Universal and expandable variable height units in smoked glass or Nextel coated MDF  
**R5555** 4 shelf glass or Nextel support £159.95  
**GR5555** 4 shelf smoked glass console £259.95  
**Target** Industry standard steel/wood racks  
**AER4** 4 shelf unit spike or castor fixing £155.95  
**AER5** 5 shelf unit spike or castor fixing £169.95  
**TTW1** Turntable/CD wall mounted shelf £52.95  
**TT5** 5 shelf spiked equipment rack £138.00  
**Partington** sturdy and very rigid steel rack  
**PES3** 3 shelf rack expandable to 5 shelves £121.95

## AFTERTHOUGHTS

Stands, interconnects and cable affect the performance of your hi fi, yet many people regard them as afterthoughts. So we make you, this offer. If you buy a quality stand or interconnect from us and you dont think your sound has improved, return it in 'as new' condition and we'll refund your money in full

## TOO NUMEROUS TO MENTION

We sell a huge number of essential and useful accessories - tape, switching boxes for sources and CDs, record, tape, CD and stylus cleaners of many kinds - all too numerous to mention. If you have a particular requirement, ask us, we probably have the solution.

## SPECIAL INTRODUCTORY OFFER!

**Kudos** stands: solid sand filled platforms, built in level setting, black gloss finish exquisitely made  
 Normally £330 pair  
 available 12", 18", 24"  
 £149.50 pair

**5 YEAR PARTS AND LABOUR FREE!**  
 on selected models from the following manufacturers.  
 QUAD Amps Tuners CD's \* MARANTZ PM40SE  
 ARCAM Amps Tuners DAC's (Delta Range only) \* PIONEER A400 Amp  
 KEF 'Reference' Loudspeakers \* AUDIOLAB Amps \* SONY TAF540E/TAF440E  
 You pay no more than the normal RRP and get the peace of mind of a "No Quibble" 5 year warranty  
 FREE of charge. Further details and conditions on request.

# GREAT VALUE ON LATEST PRODUCTS

**Best Buy** **ARCAM**  
 Alpha  
 CD PLAYER  
 (inc remote)  
**£419.95**  
 CLAIM 4 FREE CD's

**Best Buy** **AIWA**<sup>®</sup>  
 ADF810  
 CASSETTE DECK  
**£199.95**  
 CLAIM 10 FREE CASSETTES WORTH £15

**Best Buy** **AIWA**<sup>®</sup>  
 XC700  
 CD PLAYER  
 (inc remote)  
**£179.95**  
 CLAIM 2 FREE CD's

**Best Buy** **JPW**  
 Sonata  
 LOUDSPEAKERS  
 (real wood veneer)  
**£114.95** per pair  
 CLAIM FREE STANDS & SPEAKER LEADS

**Best Buy** **Mission**  
 760i  
 LOUDSPEAKERS  
**£119.95** per pair  
 CLAIM FREE STANDS & SPEAKER LEADS

**Best Buy** **NAD**  
 5420  
 CD PLAYER  
**£179.95**  
 CLAIM 2 FREE CD's

**Best Buy** **ROTEL**  
 RCD 965 BX  
 CD PLAYER  
**£299.95**  
 CLAIM 4 FREE CD's

**Best Buy** **PHILIPS**  
 CD634  
 CD PLAYER  
**£149.95**  
 SAVE £100

**Best Buy** **Marantz**  
 CD42  
 CD PLAYER  
**£169.95**  
 CLAIM 2 FREE CD's

**0% FINANCE at MRP.**  
 Selected products & systems only.  
 Minimum balance £300 (subject to status).  
 Written details on request (0% APR).

# HUGE CLEARANCE SALE

The products below must be cleared at crazy prices. Most are in very limited numbers so hurry to avoid disappointment. Some are brand new, most are ex display but generally in mint condition with full instructions, accessories leads and guarantee. Please note they can only be purchased from our **Sevenoaks, Watford & Leicester** branches. (Mail order from Sevenoaks branch only).

## DEDUCT 30% OFF THESE PRICES

- ARCAM Delta150 £359.95
- B&O BE6500 £615.95
- BM6500 £715.95
- CD6500 £615.95
- BG6500 £405.95
- CANON S50 £349.95
- CELESTION CEL 100 £499.95
- SL6S1 Black £409.00
- DENON DCD860 £259.95
- DCD960 £299.95
- PMA860 £239.95
- DUAL CV600 £149.95
- CC800 £149.95
- CD100 £139.95
- CT700

- CS750 £299.95
- CC8010 £79.95
- DUNLOP/SYSTEMEK IIX £189.95
- EAR 509 £2099.95
- EAR 802 £1312.95
- EAR TX4 £445.95
- KENWOOD DP7030 £299.95
- DP950 £169.95
- MARANTZ CD62 £299.95
- SD40 £149.95
- SD62 £249.95
- SD315 £179.95
- MUSICAL FIDELITY SD315 £899.95
- P180 £399.95
- CRPS £499.95
- NAD 3020i £129.95
- 3225PE £149.95
- PHILIPS CD624 £199.95
- SONY TAF440 £179.95
- TECHNICS RSTR212K £149.95
- SLPG100AK £139.95

- SLPG400AK £179.95
- YAMAHA KXW332 £199.95
- CDX1050 £239.95
- AVX700 £429.95
- AX550 £409.95
- KX530 £239.95
- CDC615 £229.95
- DSPE300 £299.95
- GALE 210 £559.95

## DEDUCT 40% OFF THESE PRICES

- B&O RL140 £590.95
- RL45 £255.95
- RL60.2 £335.95
- Lab 3000 £910.95
- Lab 5000 £1195.95
- DENON DRN500 £159.95
- KENWOOD GE450 £99.95
- GE450 £99.95
- GE420 £149.95
- GE850

- ROKSAN Artaxexes £559.95
- ROTEL RCDB65 £299.95
- RDB55 £179.95
- CELESTION DL6SII £185.95
- MONITOR AUDIO MONITOR 11 £329.95
- TECHNICS SBSC60K £69.95
- SBSC9K £149.95
- SBEX3K £249.95
- SLPA10 £259.95
- YAMAHA AX35C £199.95
- AX450 £199.95
- CD750 £69.95
- RM450 £149.95
- EQ550 £249.95
- £449.95

## USED BARGAINS Available at Sevenoaks Branch only

- QUAD 22/III (Valve) £139.95
- 34 PRE (Brown) £189.95
- 44 PRE (Brown) £199.95
- 306 PWR (Grey) £249.95
- 33 PRE £50
- ORACLE Alexandra TT £499
- GOLDRING GL75 TT £39
- KENWOOD DPX9010 Trans Mus Fid Digiolog £299
- AUDIOLAB 8000A Amp £249
- PIONEER SX959 Rec £149
- TANNOY DC200LS £219
- B&W DM620 £79
- DENON DCD800 £139
- MARANTZ CD65 CD

## DEDUCT 50% OFF THESE PRICES

- AIWA DXM77 £149.95
- CAMBRIDGE C70 £249.95
- KEF CR250 Quattro 15 £274.95
- £409.95

- NAD S240 CD £129
- TEAC P500 CD £499
- DELTEC PDMM II DAC £499
- 50S Pre £699
- EAR 509 (pr) £1260
- MON AUDIO Studio 15 £999
- NAKAMICHI RX202 £350
- MANTICORE Mantra/RB250 £199



**SEVENOAKS HI-FI & VIDEO**

This advertisement is valid until at least 31st August 1992.

## Display, Demonstrations and After Sales

Unlike many of our competitors, all products (subject to availability) are on display and may be auditioned in dedicated listening rooms in any of our branches. Our helpful staff enjoy and understand the products they sell and will be only too happy to assist you through the product choices that lie ahead. Our Sevenoaks service dept is one of the largest and best equipped in the business and will maintain your purchase in tip-top working order at all times.

## SUGGESTED SYSTEMS

The suggested systems priced below all include the popular NAD 5120 turntable but an alternative turntable or CD player is available at extra cost. Please see "OPTIONS" list below for further details.

**FREE**  
with suggested Systems

- Cartridge (turntable based systems only)
- Speaker Leads (80 strand cable)
- Carriage (Systems over £300)

SPEAKERS	Widale Delta 30.2 JPW Samata (V) M Short 3.10 Celestion DLA II Galle GS210	Collection 3 JPW Sonata (W) W Dale Diamond 4 Royd A7 Tannoy 603 Mission 760i Goodmans maxum III	Nad 8225e Celestion 5 B&W DM600 Kel K120 Tannoy 605 Moni/Aud o One	Moni/Aud R7 Heybrook Sole Mission 761	Tannoy 607 B&W DM610 A/Research M1 Colimation 7 Widale 505.2	Castle Warwick Mission 762 Rogers LS2A-2 JPW AP3 Kel 140	Castle Durham Heybrook HB173 Tannoy 609	Rogers LS4A-2 B&W DM620 Heybrook HB100 Kel 160	
AMPS	Marantz PM30 NAD 3020i Rotel RA 920AX	264.95	280.95	308.95	324.95	344.95	364.95	384.95	424.95
	Kenwood KA3020	272.95	287.95	315.95	331.95	351.95	371.95	391.95	431.95
	Nad 3225 PE Marantz PM30SE	280.95	295.95	323.95	339.95	359.95	379.95	399.95	439.95
	Rotel RA 930AX Pioneer A300 Dual CV 5600	288.95	303.95	331.95	347.95	367.95	387.95	407.95	447.95
	Technics SUVK500K	295.95	311.95	339.95	355.95	375.95	395.95	415.95	455.95
	Nad 3240PE Technics SUVK600K	319.95	335.95	363.95	379.95	399.95	419.95	439.95	479.95
	Sony TAF540E	343.95	359.95	387.95	403.95	423.95	443.95	463.95	503.95
	Marantz PM40SE Yamaha AX550	351.95	367.95	395.95	411.95	431.95	451.95	471.95	511.95

2 CD's FREE with all CD based systems

### Options

The following Compact Disc Player or Turntable may be ordered instead of the NAD 5120 in the above systems.

#### CD Players

- Alwa XC300
- Alwa XC700
- Denon DCD480
- Denon DCD590
- Denon DCD580
- Denon DCD660
- Denon DCD690
- Denon DCD890
- Denon DCD1290
- Karwood DP3040
- Marantz CD42

- Add £29
- Add £79
- Add £49
- Add £69
- Add £79
- Add £99
- Add £99
- Add £169
- Add £229
- Add £79
- Add £69

- Marantz CD52
- Marantz CD52SE
- Marantz CD72
- NAD 5425
- NAD 5425
- NAD 5440
- NAD 5440
- Philips CD604
- Philips CD634
- Philips CD850 Mk II
- Pioneer PD4700
- Pioneer PD5700

- Add £99
- Add £179
- Add £199
- Add £299
- Add £79
- Add £99
- Add £199
- Add £19
- Add £59
- Add £199
- Add £29
- Add £49

- Pioneer PD6700
- Pioneer PD7700
- Pioneer PD8700
- Rotel RCD955AX
- Technics SLPG420AK
- Technics SLPG420AK
- Technics SLPG520AK
- Technics SLPG620AK
- Technics SLPG700AK
- Technics SLPS900AK
- Sony CDP397
- Sony CDP497

- Add £69
- Add £149
- Add £199
- Add £159
- Add £39
- Add £59
- Add £99
- Add £129
- Add £169
- Add £249
- Add £39
- Add £59

#### Turntables

- Dual CS415
- Dual CS503.2
- Dual CS505.4
- Rotel RP855
- Thorens TD280II
- Systemdek IIK900 (+ choice of arm)

- Add £99
- Add £0
- Add £49
- Add £79
- Add £99
- Add £89
- P.O.A.

# FREE Headphones:-

Spend over **£500** on any Hi Fi Products before 31 August 1992 and claim a pair of Sennheiser headphones **FREE!**



HD480 MkI

\* Offer commences 16th July 1992.  
\* Maximum 1 pair per customer.  
\* HD450 will be substituted when HD480 runs out.

# BUY WITH CONFIDENCE

**IN STORE & MAIL ORDER** - You can buy with confidence from Sevenoaks Hi-Fi & Video. We've been in business for 20 years and have lots of experience with personal callers and Mail Order customers. All goods are **BRAND NEW, FULLY GUARANTEED** and maintained by our own service department. For personal attention and demonstration call into any of our branches, if you live too far away, simply post or phone your order through and our efficient Mail Order department at Sevenoaks head office should have your equipment safely delivered within 2 or 3 days, subject to availability. Carriage is only £7 per order and generally **FREE** if total exceeds £300 (UK mainland only). All goods are insured against loss or damage in transit. Payment may be made by cash, cheque, Access or Visa (Barclaycard). Prices include VAT.

## Amplifiers

- Albany P01 £429.95
- Albany S50B £499.95
- Albany AP4 £349.95
- Arcam Alpha III £409.95
- Arcam Delta 90.2 £519.95
- Arcam Delta 120 £719.95
- Arcam Delta 110S £199.95
- Arcam Delta 110 £269.95
- Aura VAS0 £429.95
- Aura VAI00 £629.95
- Audiolab 8000A91 £669.95
- Audiolab 8000C91 £359.95
- Audiolab 8000W (teach) £299.95
- Audiolab 8000P £379.95
- Cyrus One II P.O.A.
- Cyrus PSK II £139.95
- Cyrus Two II £169.95
- Deltec Denon PMA250 II £239.95
- Denon PMA350 £549.95
- Denon PMA 860 £529.95
- Exposure EXP20 £579.95
- Exposure EXP7 £174.95
- Exposure EXP85TD £139.95
- Harman HK6100 £129.95
- Kenwood KA3020 £149.95
- Marantz PM30 £239.95
- Marantz PM 30SE £299.95
- Marantz PM 40SE £299.95
- Marantz FID A1 Mk II £799.95
- Musical FID B1 II £729.95
- Musical FID A200 £799.95
- Musical FID P173 £299.95
- Musical FID P180 £45.95
- Musical FID The pre £149.95
- Musical FID Typhoon £129.95
- Musical FID Bridging cable £199.95
- Nad 3025P £159.95
- Nad 3025PE £239.95
- Nad 3240E £199.95
- Pioneer A300 £794.95
- Pioneer A400 £366.95
- Philips FA930 £325.95
- Quad 34 £129.95
- Quad 36 £169.95
- Quad 606 £249.95
- Quad RA920AX £329.95
- Rotel RA930AX £189.95
- Rotel RA940AX £349.95
- Rotel RA960BX £159.95
- Rotel RA960BX £274.95
- Rotel RB960BX £179.95
- Rotel RC960BX £229.95
- Rotel RC980BX £199.95
- Sony TAF340E £479.95
- Sony TAF500E £179.95
- Technics SUVX00K £129.95
- Technics SUVX00K £259.95
- Technics SUVX00K £479.95
- Yamaha AK450 £179.95

## Cassette/DCC

- Awia ADF410 £699.95 (FT)
- Awia ADFB10 £199.95 (FT)
- Awia ADF910 £249.95 (FT)
- Arcam Delta 100 £669.95 (FT)
- Arcam KHS9000 £849.95 (FT)
- Arcam Delta 100 £139.95
- Denon DRM510 £229.95
- Denon DRM710 £199.95
- Denon DR5610 £189.95
- Denon DR5810 £179.95
- Denon DRW650 £179.95 (FT)
- Denon DRW650 £149.95 (FT)
- Dual CC8010 £229.95 (FT)
- Dual RC965AX £179.95 (FT)
- Marantz SD50 £169.95 (FT)
- Marantz SD315 £699.95 (FT)
- Nad 6325 £499.95 (FT)
- Nad 6340 £439.95 (FT)
- Nakamichi Deck 1 £179.95
- Nakamichi Deck 1.5 £149.95 (FT)
- Nakamichi Deck 2 £199.95 (FT)
- Philips DCC £249.95 (FT)
- Philips FC920 £449.95 (FT)
- Rotel RD945AX £169.95 (FT)
- Rotel RD965BX £139.95
- Sony DTC750 £179.95
- Sony TCK520 £149.95
- Technics RS8X404K £219.95
- Technics RS8X07K £179.95
- Technics RS8X107K £249.95
- Technics RSTR12K £149.95
- Technics RSTR151K £179.95
- Technics RSTR323K £149.95
- Technics RSTR333K £179.95
- Yamaha KK250 £179.95
- Yamaha KK330 £229.95
- Yamaha KK360 £179.95
- Yamaha KK650 £299.95

Present this ad to claim Free Stands & Cable (80 Strand with loudspeakers over £115 pair (excluding 5 Systems & XD)

Present this ad to claim Free P.O.A.

Present this ad to claim 10% off goods displaying\*\*

Present this ad to claim 20% off goods displaying\*\*\*

Present this ad to claim 30% off goods displaying\*\*\*

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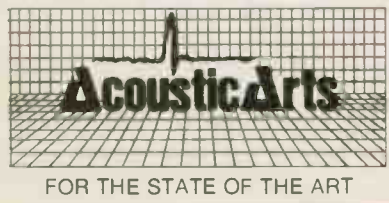
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