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DIY SUPPLEMENT No. 9
handed to this issue

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Tel: 0224 625 635

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Bloxwich,
West Midlands.
Tel: 0922 493499

Audio Suite
3 Bridge Street,
Guildford,
Surrey.
Tel: 0483 504801

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London W1M 7LH.
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Shropshire SY1 2ES.
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World Radio History
THIS MONTH'S REVIEWS

AMPLIFIERS

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A taste of real high-end for £1500. Audionote package a single-ended valve amplifier into a conventional case, suitable for any home. Noel Keywood comes away impressed.

ORELLE SC-200/SP-150 35
Power is no problem from this affordable pre/power amplifier combination, Dominic Baker finds.

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Audiolab bring out a top CD transport, based on Philip's specialised CDM-9 Pro mechanism. Noel Keywood spins the frisbees.

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IMPULSE H7 52
Eric Braithwaite finds a mini-horn that is bad for boy sopranos.

TDL NFM 64
The big TDL sound with plenty of bass - at a price anyone can afford. Dominic Todd likes what he hears.

UKD CALLAS 17
A beautifully crafted, solid wood loudspeaker from Italy leaves Dominic Baker impressed. Here's elegance with fidelity.

Hi-Fi World is pleased to announce "ABC Membership has been approved pending first audit certificate for the period January - June 1994". We hope to publish a circulation figure in the October '94 issue.

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Hi-fi tweaks that work.
DIY SUPPLEMENT

Here's just a taste of what you'll find in this month's FREE DIY Supplement, bound to the issue:

ADVANCED 3-WAY LOUDSPEAKER
Build KLS3, our advanced carbon-fibre cone three-way loudspeaker, designed by Dominic Baker.

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Acknowledged around the world as one of Britain’s finest amplifiers, here’s the first part on buying and restoring a Leak TL12, from expert Graham Tricker.

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Noel Keywood heads North to Birmingham on a sunny Sunday to look for vintage hi-fi bargains at one of Britain’s largest events.

HIGH QUALITY HEADPHONE AMPLIFIER
Richard Brice gives full details on his single-ended Class A headphone amplifier.

BOOK REVIEWS
The original Williamson amplifier articles, and John Linsley Hood on audio circuit design.
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HPW Please return this coupon to: LIVE '94, News International Exhibitions Ltd, Europe House, World Trade Centre, St Katharine-by-the-Tower, London E1 9AT.
PROAC UPGRADE RESPONSE ONE S

ProAc have upgraded the performance of their miniature Response One S loudspeaker. The principle modification is the use of a new bass/midrange driver, having a transparent cone and offering greater rigidity and improved damping. Along with a re-designed crossover this is said to give the Response One S a more extended and powerful bass along with a cleaner and more open midrange.

The modification has been incorporated into all Response One S loudspeakers since January '94; older models can be updated by your local dealer for £150, or by ProAc if returned to the following address:

Celef Audio/ProAc
Highpoint House,
Riding Rd.,
Buckingham Road Ind. Est.,
Brackley,
Northants. NN13 1AA
Enquiries Tel: 081 953 8933

OVAL GOLD DOME TWEETER FROM AUDAX

Audax have recently revealed a new tweeter fitted with an oval gold dome. But, unlike conventional tweeters, it has no voice coil and no magnet. The tweeter works on the piezoelectric principle, using a piezoelectric polymer film coated either side with pure gold. The polarised film is clamped to an elliptical ring with a sealed and pressurised chamber behind it. It is supplied with a matching transformer and is suitable for systems having a sensitivity between 86dB and 94dB.

The new gold dome has a moving mass around twenty times lighter than a conventional 20mm dome, which gives the new unit the transient clarity of the best electrostatic units, along with the power handling of a conventional driver. We hope to have one in for test for the next supplement.

Harman Audio UK
Unit 2,
Borehamwood,
Herts. WD6 5PZ
Tel: 081 207 5050

KAR'S AFFORDABLE FLOORSTANDER

Keswick Audio Research have recently launched a new floorstander, the Volante. Using a 6.5inch, silicon damped paper bass unit, designed in-house, and a 19mm polymer dome tweeter, the Volante claims a high 90dB sensitivity, making them suitable for low power valve and transistor amplifiers alike.

The Volantes are available in a choice of finishes: satin black lacquer, mahogany and dark or light cherry, all for a very reasonable £499.

Keswick Audio Research
54 Coach Rd.,
Outwood,
Wakefield,
W. Yorks.
WF1 3EX
Tel: 0924 870606
SONY LAUNCH NEW RANGE
Following the spring trade shows, Sony will be introducing a new range of hi-fi components which should be entering the shops as you read this. Following on with the success of their 'UK sound' components, Sony have introduced a bigger range for this year. These include a MOSFET integrated amplifier - TAF244E £199.99; two other UK design concept amps.; a tuner with RDS, the STS505ES £249.99; four cassette decks, three with Dolby S including a twin deck, ranging from £179.99 to £299.99 and two CD players - CDP915E at £249.99 and CDP715E at £299.99.

One of the most interesting products though, or worrying if you're a manufacturer, that will be appearing is the MHC-7900AV mini system. Although equipped for AV, minute in size and covered in flashing lights, it does have something appealing to offer the audiophile. The loudspeakers use an electrostatic mid and treble unit - watch out Quad! But as if that wasn't enough for a mini-system, their bass units use motional feedback - watch out Tannoy! We are eager to hear how good they are.

Sony UK
Sony House,
South Street,
Staines,
Middlesex.
TW1 8 4PF
Tel: 081 784 1144

VITAVOX SHOW OFF THEIR RANGE
Vitavox have produced a new catalogue detailing their extensive range of drive units and microphones. The range includes normal cone loudspeakers for music reproduction, horn loudspeakers, pressure drivers, underwater loudspeakers, microphones and much more. For a catalogue contact:

Vitavox Division
Secomak Ltd,
Honeypot Lane,
Stanmore,
Middlesex.
HA7 1BE
Tel: 081 952 5566

PHILIPS MOVE AUDIO PRODUCTION TO SINGAPORE
Philips recently moved the remainder of their Business Audio Group to Singapore. "That's where all the activity is these days", said Angelique Paulussen from their Dutch press office. "The group is now headed by a Singaporean, but it has many European staff too". Only 20 people dealing with audio remain at Holland's European headquarters in Eindhoven, Holland. All those responsible for product strategy, conceptualisation, design, development and production are now sitting close to the equator where the commercial, as well as the local climate is somewhat hotter than anything they've been used to.

Production is now carried out at various factories scattered throughout Asia, but especially in Malaysia. This leaves only the most fundamental audio research in Holland (and Belgium). Of 6000 people employed worldwide in audio design, development and manufacture, a majority are now located in the East.

NEW CABLES FROM PATH
Latest additions to the IXOS range of cables are two Superstrand cables, 603 and 604. 603 is made up from 336 x 0.1mm 99.999% pure copper strands and 604 a bi-wire version using 630strands of 0.07mm copper for the treble and 15 x 0.15mm strands for the bass, again 99.999% purity copper is used throughout.

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Bucks.
HP12 3BG
Tel: 0494 441736
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- Cinema DSP gives you the same dynamic, all enveloping experience that the sound director intended you to have.

Considerable time and effort has gone into the creation of the Bill Hutchinson Innovation Award Scheme, drawing from more than two decades of experience and expertise.

The Innovation Award is designed to assist you in identifying state of the art equipment that matches your expectations whilst being of a build quality that ensures many years of enjoyment.

A list of priorities have been drawn up in order to establish the framework of the Award Scheme. The main priorities are sound, value, construction, design, style and originality.

The choice of dealer should be given the same care and attention as is given to your choice of equipment, so that you may receive the kind of quality service and advice that compliments equipment of the same standard. The type of service you ultimately receive will reflect on your overall enjoyment of the product. A long-term association with a professional dealer has real benefits and will serve as your personal contact for information and advice on the Manufacturers latest Innovations.

If it is not possible to visit a Bill Hutchinson Hi-Fi AV Centre, simply contact the Manufacturer for details of your nearest authorised stockist.

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- GLASGOW 43 Hope Street. Tel: 041-248 2857
- EDINBURGH 40A Queensferry Street. Tel: 031-220 0909
- LEEDS 26-28 Woodhouse Lane. Tel: 0532 427777
- NEWCASTLE 87A Clayton Street. Tel: 091-230 3600
- MANCHESTER 50/52 Deansgate. Tel: 061-832 1600
LOUDSPEAKER PYRAMID
Using Bandor drive units, and available in either active or passive form, the APEX100 is a new pyramid shaped loudspeaker from Questech Systems. The cabinet is sealed (infinite baffle), with an internal volume of around 48 litres and a standard finish of oiled American walnut.

The APEX100s are available with a standard passive crossover which allows for bi-wiring or a fully active crossover. The model shown has an extra tweeter fitted which improves power handling.

Questech also stock a range of loudspeaker components for the enthusiast, including inductors, polypropylene capacitors and hardware.

Questech Systems
2 Wheatsheaf Way,
Linton,
Cambs.
CB1 6XB
Tel: 0223 891091

A NEW DIRECTION FOR KEF
KEF Audio have appointed a new Managing Director, Ray Lepper. Ray has had a long association with KEF, working as president of Craftwise in America and more recently as Managing Director of KEF Electronics of America. Ray took over from existing Director Frank DiGirolamo on 20th May '94.

KEF Audio
Eccleston Rd,
Tovil,
Maidstone,
Kent.
ME15 6QP
Tel: 0622 672261

MATSUSHITA ANNOUNCES PROFIT FALL
Matsushita, one of the world's largest electronics companies and owner of the Technics and Panasonic brand names, announced a pre-tax profit fall of 21% up to the year end of March 1994. However, since the final figure was no less than £817 million, perhaps this was not too worrying for them. It may not match British Telecom's £2.3 billion, nor Marks & Spencer's £850 million, but it is well ahead of apparent competitors like Philips, for example. A large slice of income and profit came from the success of Jurassic Park, produced by MCA, whom Matsushita bought a while back to get into software production. Audio sales in Japan are stagnant.

PIONEER ANNOUNCE PROFIT FALL
Pioneer suffered a whopping 39% fall in profit, down to £42 million at year end March 1994. Product sales fell due to the high Yen reducing exports and slack home demand, Pioneer said.

A MINI WITH STYLE
Denon have recently introduced a new mini component system, the D-F10. It is aimed at the kind of person who appreciates high quality sound, but isn't prepared to turn over their front room to get it. It is elegantly styled and comes complete with remote control, but unlike many of the Japanese mini systems, each of the components can be purchased separately. The basic system comprises CD player and amplifier which retails for £499, the full system including cassette deck and tuner £999 and Denon's own UK design speakers are available for £150 extra.

Hayden Labs.
Chiltern Hill,
Chalfont St. Peter,
Gerrards Cross,
Bucks. SL9 9UG
Tel: 0753 888447

JVC ANNOUNCE REDUCED LOSS
JVC announced a net loss of £125 million for the year ending March 1994. Although this is the third year in which the company have made a loss, it is less than half last year's result and the company is optimistic about the future, expecting to turn a profit over next year's trading. Matsushita (Technics & Panasonic), which owns 52.4% of JVC, will be sending in a new president all the same. Again, stagnant home sales and exports hit by the strong Yen are to blame, the company said.

THORN EMI PROFITS RISE
Music sales are in good shape at Thorn-EMI, Colin Southgate, managing director said recently. Profits have risen 22% to hit £382.4 million. Much of this was contributed to by music sales, which rose by no less than 25%. As a growing strength in the music industry, Thorn is divesting itself of other activities to be able to concentrate better on what it now sees as its core business. This includes the sale of Thorn lighting.

The company's HMV record store chain also experienced an increase in profit to £6.1 million, also enjoying a 25% increase in sales. However, with a turnover of no less than £404 million, profits here look meagre, so there would appear to be plenty of room for improvement.
Experience just how good your LPs and CDs really can sound by listening to them through one of our hi-fi systems. From £50,000 to £500 we put together the finest hi-fi to suit every budget.

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0 8 1 8 7 5 9 5 9 3
The gun's chamber sounded close - very close. It spun and the firing mechanism gave a resounding crack which echoed around the room. It was a small thing, a sound effect, but it sounded very real; at this point I suddenly became acutely aware that I was listening to an exceptionally good single-ended amplifier. When events seem to hang in the room, to rebound off the walls, taking over the room completely, the magic of a single-ended amplifier is at work.

I hadn't put on No Name on the Bullet to listen to a spinning chamber; I'd put it on casually just to see how the OTO SE would handle something from CD that might be anathema to it - the heavy bass, searing treble and thoroughly synthesised effects of Language Bamer. Could the OTO handle Robbie Shakespeare's rumbling bass lines, I wondered, or would it wilt, producing a pale interpretation; would the hard, synthesised 'hand claps' on this CD be gently, euphonically smoothed over? This sort of music was never meant for an 8watt amplifier. The menace of the gun was unexpected, forcefully underlining the fact that a good single-ended amplifier can sound almost too real.

Apart from the spectacular way the SE will invasively throw an event into a room, a trick it manages with vocalists as well as spinning gun chambers most listeners will be glad to know, it also has more than enough muscle to deliver fulsome deep bass with an adroitness that belies its paper specification. Hard treble transients weren't gently smothered either and orchestral climaxes filled the room with little sign of strain; the OTO came over as an amplifier with apparently unlimited power reserves - it has a very big sound.

The traditional strengths of a good single-ended amplifier are primarily superb resolution of timbral colour and vividly realistic image construction. Sweet, easy treble is another plus point and the OTO SE had all of these properties in full measure. Simpler, purer recordings than Language Bamer show up these strengths most clearly. The sweet resonance of the guitar strings at the start of All That You Have Is Your Soul showed just how much vibrancy and colour exists in Tracey Chapman's acoustic guitar as she carefully lays out the simple introduction to this song. The low, gruff tones of her voice seemed wonderfully close and real, echoes within the studio around her adding to create a breathtakingly intimate perspective.

With this sort of material the OTO SE seems unduly quiet in itself too; there's no hiss or hum, but also no mush or modulation noise. This deeply quiet background works to bring a wonderful...
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Each cable is made up of very fine core copper strands rated at 6-Nines (that's a copper purity of 99.9999% — it doesn't come much better), is flat and flexible for easy installation and features a 'tack-rack' for panel-pin fixing.

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPK 100</td>
<td>Twin-core white cable, each core with 130 copper strands (total 260 strands).</td>
</tr>
<tr>
<td>SPK 200</td>
<td>Triple-core grey cable for bi-wiring with twin-core treble (260 strands) and 3-core bass (390 strands).</td>
</tr>
<tr>
<td>SPK 300</td>
<td>7-core blue cable having 13 strands per core (each strand laminated). Requires soldering.</td>
</tr>
</tbody>
</table>

You'd better hound us for the name of your nearest stockist.

Ortofon (UK) Limited, Chiltern Hill, Chalfont St Peter, Bucks SL9 9UG. Tel: 0753 889949.
sense of dynamic range to classical music in particular: subdued passages in Rachmaninov’s Piano Concerto No 2 sounded sweet and clear; they didn’t appear to get lost within that strange something that seems to pollute solid-state at low levels, forcing Astorhazy’s delicate touch to fight its way through a sea of dullness and haziness. By conveying such low level delicacies with tactile clarity, crescendos sweep past with unstrained majesty; there’s no need to jump for the faint of heart. This is definitely an amp for vinyl lovers. It all-valve phono stage contributes towards.

The OTO SE had heavier but delineation too, imparting seismic power and rock fans are likely to protest. So the OTO SE is a sensitive and specialised amplifier. Properly matched to good loudspeakers, however, and used within its limited power output (which I didn’t find a problem, but I don’t play loud) it offers a superb listening experience. In my view easily justifying its price which, by esoteric hi-fi standards, is relatively modest.

**OOTO (Phono)**
Audio Note Ltd.,
Unit 1, Block C,
Hove Business Centre,
Fonthill Road, Hove
E.Sussex BN3 6HA
Tel: 0273 220511

---

**MEASURED PERFORMANCE**

Single-ended valve amps produce significant amounts of distortion, especially as they approach full output. Since this is never very high - 20-30watts at most - even at low levels distortion is not insignificant. With the OTO it measured 0.5% at 1 Watt, most of it second harmonic. At full output (8watts) the figure increased to 2.2%, comprising equal amounts of second and third harmonic. Whilst the amp is run within its output limits only second harmonic distortion will be generated at typical average music levels, higher harmonics affecting short term peaks. In my view, the 0.5% figure is about as much as it is wise to tolerate at normal music levels, but in use the OTO SE, contrary to what these figures might suggest, sounded clean and relaxed. I do not do most valve amplifiers.

**Frequency response extendeddownwards well, reaching 8Hz. However, high frequencies rolled off a little early, reaching -1dB at 20kHz, although this is no different or worse than either an Aura VA-50 or a Linn Majik-I, both solid state. Noise was low, in view of the extremely high input sensitivity of 45mV.**

<table>
<thead>
<tr>
<th>Noise</th>
<th>-82dB</th>
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</thead>
<tbody>
<tr>
<td>Distortion</td>
<td>0.5%</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>45mV</td>
</tr>
<tr>
<td>dc offset</td>
<td>none</td>
</tr>
<tr>
<td>Disc</td>
<td></td>
</tr>
<tr>
<td>Frequency response</td>
<td>60Hz-17kHz</td>
</tr>
<tr>
<td>Separation</td>
<td>55dB</td>
</tr>
<tr>
<td>Noise</td>
<td>-54dB</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0.5%</td>
</tr>
<tr>
<td>Overload</td>
<td>5mV</td>
</tr>
<tr>
<td>150mV</td>
<td></td>
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</tbody>
</table>

The moving magnet disc stage (47kΩ), was sensitive enough at 0.38mV for moving coils, yet it has a very high overload ceiling of 150mV, so it can be used with both MMs and MCs. It was quiet (with MM) and has a warp filter, which is wise, preventing subsonic warp signals saturating (magnetic overload) the output transformers, something that happens at just a few watts below 10Hz or so. Equalisation was accurate enough, but high frequency response reaches just 17kHz (-1dB). Since many cartridges peak up by a few dB around 18kHz, this isn’t such a bad thing. Single-ended amplifiers can have a magic sound, even though they don’t measure so well. In this respect, the OTO SE differs little from the norm. It is, however, very flexible, with a well engineered disc stage.

**TEST RESULTS**

| Power | 8watts |
| CD/Tuner/Cassette |
| Frequency response | 8Hz-20kHz |
| Separation | 6.5dB |

---

Photo credit: Audionote fit the usual IEC mains socket at rear, plus a line of six speaker sockets that between them give 412 and 812 output options.

Switch on and a dull red indicator on the front panel lights up. There’s no thump, hiss or hum to be heard from the speakers. In spite of its unusual circuit topology, the OTO behaves like a good valve amp; music fades in and out slowly at switch on and off.

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TESSERAC AUDIO
The Best of British High End
Hewn from solid Walnut, the Callas loudspeakers quite literally provide a scent of esoterica. They're an Italian thoroughbred, with an apparent history of craftsmanship behind them. If told that the wood was painstakingly hand carved and finished over a period of months, you wouldn't disbelieve it, such is the quality of their finish. It has a rough, oily texture, the roughness I suspect being deliberate to emphasise the fact that humans, not machines, crafted these speakers. And why not? At £850 for a 'speaker not much bigger than a budget bookshelf model, you need as many enticing features as possible to lure potential customers. Few will complain; I certainly appreciated the dense, woody feel of the Callas.

Fortunately, these speakers are not sheep in wolves' clothing. Removing the grilles revealed two high quality Focal drive units, neatly rebated into the baffle. There is a less expensive (£750) version of the Callas which uses Wharfedale drive units and a mahogany finish.

The tweeter is instantly recognisable from its inverted-dome Kevlar diaphragm. This has the advantage of providing slightly narrowed, but even dispersion. It reduces the amount of treble hitting the walls and ceiling, whose destructive reflections result in a loss of focus. The Tonigen ribbon tweeter is another example of a narrow (vertical) dispersion tweeter, this unit being well known for its superb imaging properties and clean, precise treble.

The bass unit is a similar size to the KEF BI 10 used in an LS3/5a, but has a chunky, cast chassis. Its cone is made from sturdy polypropylene fitted with a supple rubber surround, so I'd expect fairly punchy and solid bass. Sitting in the centre of the cone is the dust cap, which has an interesting shape, similar to that of a hazelnut whirl. This is a dual voice coil driver which, with some clever crossover engineering, can be made to produce solid, deep bass from a relatively small cabinet volume.

The crossover itself is a high quality affair. Close tolerance polypropylene capacitors and air cored inductors are used throughout to minimise performance variations between samples. Here, another advantage of the inverted dome is put to use. Generally, any reasonably sized bass unit starts to break up around 3-4kHz, resulting in roughness in the
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upper midrange. The inverted dome tweeter extends further down than most, allowing the crossover point to be set at a lower than usual 2kHz. This means that the bass unit is rolled off long

handles. The dry, crisp, fast sound of the tweeter was not matching the warm sound of the bass midrange unit too well, something a low crossover point emphasises.

The dry kick drum on Grant Lee Buffalo's country style acoustic set had plenty of atmosphere and detail to it; the impact triggered with the foot pedal and the following echo from the studio was clearly evident. This album also highlighted the superb qualities of the treble unit. It was exceptionally clear, with vigour and in a tuneful manner. It was also clean and well projected - as were Courtney Love's on 'Miss World'. The dry, crisp, fast sound of the bass midrange will push detail forwards, giving a basically accurate portrayal of the tonal balance of a piece of music. I found them to be a lovely package.

The dry kick drum on Grant Lee Phillips' 2ruff vocals were also clean and well projected - as were Courtney Love's on 'Miss World'. The midband I found was very smooth; the dense, inert cabinets also kept these drivers to display their fine properties. The dry, crisp, fast sound of the bass midrange structure of a steel-strung acoustic guitar and the bright metallic chime of cymbals.

Grant Lee Phillips' gruff vocals were also clean and well projected - as were Courtney Love's on 'Miss World'. The midband I found was very smooth; the dense, inert cabinets also kept these speakers free from boxiness, allowing the drivers to display their fine properties. The only gripe I have about the midrange is that female vocals could lose a little body, due to some emphasis of their upper registers. Suzanne Vega, for example, who has a dry, hollow voice could become even thinner, losing power. Strings too, suffered from this thinning effect, becoming too reedy, although this was less immediately evident.

I suspect that this is due to a combination of things. Firstly, the lower-than-usual crossover point puts vocals very close to this region. I could clearly hear them coming from the tweeter, showing just how much information it

before it starts to break up, hopefully resulting in a cleaner, smoother midband.

Although the internal cabinet volume of the Callas is very small and the bass unit a mere four inches across, it produces weighty and powerful bass, making it ideal for those with a small listening room. The polypropylene cone adds some colouration to the sound, but it's a pleasant one, adding some richness and warmth which turns the sometimes hard and dry presentation of CD into a more amenable experience. The bass has a sweet tone too, following bass lines with vigour and in a tuneful manner.

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**THURSDAY LATE OPENING**
Suddenly, our choice of really good CD transports is increasing. Arcam started the ball rolling some years ago with the sombre looking, but clean sounding Delta 170 transport, a unit I used happily for a year or more. It survived all the horrors of hi-fi reviewing, from being used as the filling in a technological jam sandwich - things on top, things below - in a picture shoot, to becoming an involuntary measure of gravitational force. (Newton was lucky to be around when the only things that dropped on your head were apples.)

Then Micromega demonstrated the delights of Philips' rare CDM-9 Pro mechanism to us - we were convinced. Faxes were sent to various obscure factories in Europe: please can you supply CDM-9 Pro for Hi-Fi World's CD transport? Opening my cupboard marked Euphemisms, I find the word 'entertaining' as one most suited to describing the antics of Philips' Modules division. In the end we admitted defeat and gave up. But we did, in the process, find out a bit about the mechanism that now resides in both Mission's new transport, reviewed with their DAC in our July issue, and selected for use in Audiolab's 8000CDM Compact Disc Transport, reviewed here. Now there are three good quality, UK-made transports widely available in Britain, from Arcam, Mission and, now, Audiolab. Anyone using CDM-9 Pro has our admiration. Both in their tenacity at dealing with Philips, the world's dottiest C.E. company, and in their belief that it is worth it just to get hold of this transport. Pro is a version of CDM-9 whose genesis we know nothing about and whose
existence was unknown to humankind until it popped up in a Micromega. This sort of obscurity reminds me of a long research paper I once spotted in an AES Journal on the behaviour of a circular electrostatic membrane - meaning a Quad ESL-63 - written by Philips Research Laboratories. Philips just do these things, without telling anybody and often without any commercial spin-off, it seems.

CDM-9 Pro has a Hall effect motor with improved speed control over the standard unit. For rigidity of structure and freedom from vibration, it is built on a machined steel base plate that sits on a suspension system. The laser uses a glass lens in place of a plastic one, for improved spot focus. Like other companies, Philips supply much of their kit in all-but-standard unit. For rigidity of structure and freedom from vibration, it is built on a machined steel base plate that sits on a suspension system. The laser uses a glass lens in place of a plastic one, for improved spot focus. Like other companies, Philips supply much of their kit in all-but-complete form - just bolt it into a box and presto - you're in business. Not CDM-9 Pro. If you want this one not only do you have to negotiate your way through Philips' labyrinthine commercial channels to get hold of it, but you must also design all the control circuits and operating logic.

The CDM-9 Pro transport mechanism - the bit that spins the frisbee and swings the laser. It is housed in a wide case (44.5cms) that just slots into a typical equipment rack (48cms max) and there's considerable depth too (33cms), but height is low at 7.4cms, giving the slimline appearance that characterises Audiolab products. The case is solidly built, feeling heavy and rigid. The disc drawer slides smoothly; it uses the usual Philips tray finished in grey Nextel. Audiolab use their own green liquid crystal display panel which lacks the contrast of LED displays, but is not deficient in legibility; I could read the large numerals of the time and track readouts from 18ft away.

As expected from the meticulous approach that Audiolab bring to product design, the 8000CDM has a wide range of facilities, not all of them found on other players. The full contents of a disc can be read any time during play as a reminder, as well as elapsed and remaining time of a track playing. Total remaining time can be read too, useful when taping. There are facilities, not all of them found on other players. The full contents of a disc can be read any time during play as a reminder, as well as elapsed and remaining time of a track playing. Total remaining time can be read too, useful when taping. There are.

The rear panel carries the normal 75Ω electrical output, but via a BNC socket instead of the usual phono. A gold plated adaptor is included as a standard supplied item. A standard optical output is fitted too, as is a fully balanced AES/EBU output. This is preferred by studios, since it hump cancels when long lines are used and it has a carefully defined transmission, line and termination impedance (110Ω).

Although many users say they now prefer this type of line, Philip Swift of Audiolab felt there was little in it, providing the normal 75Ω line was well engineered in transmission and termination impedance. I did swap between the two in listening tests and could detect no obvious differences, but the lines were very short. Over longer distances the situation may possibly change. The remote control transmitter works on line-of-sight, unlike some.

Since I never programme a CD player the lack of programming was of no concern to me, but the significance of its omission is for potential buyers to decide. I found the 8000CDM easy to use and it's a smooth operator too.

**SOUND QUALITY**

Transports are not meant to have a 'sound'. But they do, for reasons we do and do not understand. Sync-locking is a technically plausible innovation with a hypothetical and real, it turns out, impact on sound quality. By using one master clock to lock DAC and transport signal processing together, the problem of jitter and inaccurate signal regeneration in the DAC from the conventional SPDIF feed is eliminated. From my experience of living with DPA's sync-locked DACs (PDM I Series 3 especially - a wonderful unit) and, now, with Arcam's sync-locked Black Box 50, I'm convinced of its benefits. This is an aspect of transport sound quality we do understand.

Less easy to understand, but perhaps for the same reasons that sync-locking is effective, is why the transports of budget CD players do not seem to provide the same, clean, tidy sound as dedicated independent transports. In outline theory at least, they should do an equally good job. However, UK manufacturers now tell me that the quality of the digital output signal from mass produced CD players is often poor, being asymmetric, polluted by jitter and distorted by overshoot. This, they say, is where a dedicated transport gives improved results and better sound quality in consequence.

I've outlined these arguments to illustrate a few points. One is that sound quality differences between transports are often subtle and difficult to pin down subjectively. The other is that additional factors, such as interconnects, also affect matters, complicating the situation considerably in some cases.

I assessed the Audiolab 8000CDM

"From the harmonies of Londonbeat's Falling in Love Again, to the Berlin Radio Symphony Orchestra's choir on Decca's Carmina Burana, the 8000CDM transport painted a big canvas between the speakers."
transport against a known quality benchmark, the Arcam Delta 250 transport. First, both were successively played through Audiolab's own 8000DAC, then they were swapped over to play through Arcam's Black Box 50 DAC, with and without sync-locking between the two Arcam units.

With Audiolab's 8000DAC I found the transports had different presentations that became progressively more apparent with time. Generally, the 8000CDM had the better sound staging of the two, throwing up a cohesive panorama of sound between the speakers with consistently stronger centre-stage imaging. From the harmonies of Londonbeat's Falling in Love Again, to the Berlin Radio Symphony Orchestra's choir on Decca's Carmina Burana, the 8000CDM transport painted a big canvas between the speakers. In almost direct contrast, Arcam's Delta 250 transport appeared less cohesive, but more dynamic and challenging in its presentation. It brought home both the energy and virtuosity behind Hideko Udagawa's strenuous bowing of violin, elevating it from performance, as the Audiolab would have it, to spectacle. In a similar manner, John Lee Hooker's gravelly vocals were more forward with the Arcam.

My only conclusion here was that a final choice must rest upon taste and expectations. Anyone wanting a smooth, cohesive, and mildly laid back presentation with excellent sound staging should choose the Audiolab transport. More challenging dynamics came from the Arcam Delta 250.

Much to my surprise - and consternation - differences were less clear when listening to the transports through Arcam's Black Box 50 DAC, without sync-locking. The Audiolab 8000CDM again produced superb sound staging and the strong dynamics of the Black Box 50 seemed to complement its own qualities extremely well; the two worked together superbly! As I've found before, there's something a little unsettling about the Arcam Delta 250 transport working in conjunction with its own DAC, bizarre as that may seem. And here, I must admit, I am a little lost to describe the effect. It was not obviously more dynamic than the sync-locking switched in the Arcam combination put it in the bag. Individual fine events, such as the rattle of beans in a gourd shell produced by maracas came over with such pin-sharp clarity and superb delineation in the time domain that non-sync-locked converters sound temporally soft or vague in their leading edge construction by comparison. The rich array of percussive sounds typical of African music came over with fine clarity and crystal sharp precision at the start of 'Adouma', by Angelique Kidjo, for example. Whilst the Audiolab 8000CDM transport laid out the performance beautifully, again showing how composed it was in sound staging, it lacked the event delineation of the sync-locked Delta 250.

But perhaps my comparisons are unrealistic. Would anyone pair an Audiolab 8000CDM transport with an Arcam DAC? I doubt it, but I made this comparison to be sure of the qualities of the transport alone. I also ran it against a Teac P500 Esoteric and again found differences to be small, the Audiolab surprisingly appearing to possess slightly more forceful lower bass, even though it is difficult to understand how this could be so.

Most people would surely buy the 8000CDM to partner Audiolab's own 8000DAC. In this role it offers a high standard of sound staging with a slightly more distant perspective than others. In conjunction with the 8000DAC - the two will set you back around £2000 - a wide, cohesive sound stage is provided, characterised more by smoothness and fluidity of presentation, than by vivid dynamics and detailing.

The 8000CDM transport is distinguished by a wide array of facilities and a superb remote control. In short, it's another thoughtfully designed, high quality product from Audiolab that manages to combine features with performance and reliability. No wonder founder Philip Swift pulled it out of a brand new Porsche Carrera 911 when he visited; well designed and built hi-fi still sells.

Audiolab 8000CDM

£1249.90

Cambridge Systems Technology Ltd., Spitfire Close, Ermine Business Park, Huntingdon, Cambs PE18 6XY. Tel: 0480-52521
Rotel have built up quite a reputation over the years for good sounding affordable hi-fi. Although the looks - with the exception of the upper-bracket Michi range - are nothing special, they all share a no-nonsense approach where nothing is wasted on fripperies - and this includes the 930AX tuner. In a year which has seen RDS percolating down the Sony range, even into a clock radio, Rotel has eschewed even that useful accessory, instead offering twenty presets, without any naming function, plus a mono button as the only extra.

But what counts with Rotel is the sound - and this relatively inexpensive tuner sounds very good indeed. It's also less light-weight physically than many rivals, which suggests something a little more serious inside.

A couple of days' listening held no regrets for temporarily depriving myself of vinyl or CD as sources. As listening continued on into the second night, Chabrier's Espagnole greeted the close down of Radio 4 before the shipping forecast, so I turned to GLR, finding it handing over to the BBC World Service. And there arose a curiosity, hinted at in the Measured Performance column, which I read afterwards - honest! Switching to mono, even from stereo Jazz FM, the sound has just a degree of extra precision and focus to it. That's not an aural illusion, nor am I talking about imagery, but a small access of additional cleanliness. There is otherwise a degree of blurriness of lateral placement, but it is well within the bounds of the acceptable for a mid-price tuner, let alone one which is only £175. Rotel apologised for a recent price increase. So what? So it's still one of the great bargains.

Focus in itself was well on a par with models in the £300 range, but remarkably free from any minor, let alone major, vices which still often surface even in that bracket. Centrally-placed announcers tended to be a little blurred and slightly broadened, but the Chabrier piece was splendidly wide and realistically expansive. Even a good degree of depth and ambience was present, the orchestral sections seeming precisely placed and tonally very accurate, with none of the upper-midrange accentuation or diminution that has first violins and seconds merging indistinguishably, for example.

In fact the Rotel's tonal accuracy is of a very high order. Listening to some Blue Note jazz recordings on Jazz FM, the real tonal qualities of alto and tenor sax were sublime. By comparison with the Quad FM (much more expensive, remember), there were only two relatively unimportant areas of contention. For double the money, you gain the subtlety of the harmonics of solo instruments in the upper reaches. And the clarity of sound of brushed cymbals, which on the Rotel sounded 'swishy', with more pigs' bristle in the brush than wire, is greater. Even then, however, hard-struck cymbals

**PLAYING**

While Rotel's budget tuner may lack frills,

**MEASURED PERFORMANCE**

The Rotel has a flat audio frequency response to 10kHz, as our analysis shows, but it rolls off a little early, measuring -1dB at 13kHz. A slight peaking exists at 10kHz and this may well add a little brightness to the sound. Stereo separation was high and spurious output of 19kHz and 38kHz low.

Distortion was a little high on the stereo information through the decoder, but not on the mono information. Since centre-stage images figure most strongly in our perceptions I'd expect the low 0.07% mono (i.e. centre image) distortion result to have most effect on the sound, which will be minimal. The 0.3% of second harmonic on stage-left and right will also play a role, albeit a benign one, since most of it was second harmonic distortion, which is subjectively innocuous. So, on balance, the RT-930 should have a clean sound uncoloured by distortions.

With 1mV or more from the aerial hiss sank to -71dB minimum (full quieting). In this respect the RT-930 is like every other tuner - it needs a strong signal to give best results. This is why an outdoor aerial is so important in most locations.

Selectivity was very high at 82dB and sensitivity quite good at 2uV with mono signals and 32uV with stereo signals. There is no signal strength meter; a 'tuned' display comes on at or above 4uV, a very low threshold. Output measured 600mV, high enough to drive most power amplifiers direct, so this tuner can feed passive preamplifiers.

The RT-930 measures well in all areas. It is a well designed budget tuner.

NK
Eric Braithwaite finds it lacks nothing in thrills.

TUNER TEST RESULTS

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Frequency Response

Small peak may add some brightness

Distortion

Low Distortion

Slight peak may add some brightness

TUNES

Eric Braithwaite finds it lacks nothing in thrills.
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I've been eagerly awaiting Tannoy's D500s for some time now. For me, they promised to offer the effortless dynamics of the D700s, together with some of the charm of the stand mounting D100s. The D500s are floorstanders, using a similar, but smaller, line up of drive units than the D700s. They have a rich and classy feel to them, but I must agree with Dominic Todd (who comments at the end of this review) that the black lip around the top detacts from their appearance. Not that this is reason for discounting them as a quality loudspeaker. These are the third model to join the new Definition series, definition that is, 'speakers in the Definition range, the D500s are about playing music loud, and enjoying it. With this in mind, I selected Inspiral Carpets' cover of 'Saturn 5' and wound up the volume. The strong bass line that beats out the rhythm on this track powered forwards, filling the room and shaking the windows. Even at these
kind of levels the D500s are bearable, an apparent lack of compression or distortion giving them a superb clean sound.

Surprisingly, although having such a powerful presentation, the speakers can be quite subtle when required. They coped well with a variety of female vocals, from Denise Johnson’s silky smooth and rich vocal chords on Primal Scream’s ‘Free’, through Tanya Donelly’s early expressive tones on Belly’s album Star, to Courtney Love’s twisted ‘Doll Parts’ on Hole’s Live Through This. In each case the character and emotion behind vocals was clear, the varying styles of accompanying instruments made plain by the space and atmosphere within which they breathed.

A feature the D500s definitely share with their bigger brother is their ability to convey a full scale sound stage. They image reasonably well too, providing a strong sense of height and depth. Give them a good recording and they’ll paint the picture extremely well, especially considering their size; precise imagery is normally the province of smaller stand mounters. So the dual-concentric unit, at least in this application, does very well indeed.

The D500s don’t have quite the same awesome dynamic range of the D700s, but they have 90% of it and what they lose in this area is traded for some welcome warmth behind their presentation. With a good amplifier they are capable of producing a very realistic presentation of the music they are fed. They do have quite a different presentation from the norm, though, so I’d strongly recommend a lengthy demonstration before you part with the readies. And remember too, big speakers like these can give quite different results from room to room, so try to get a listen at home.

**Dominic Todd says...**

After the elegant D100s and imposing, yet subtle D700s, I found the D500s rather ungainly. This is due to an unnecessary black ridge around the top of the speaker that clashes with both walnut and broyles.

Fortunately, Tannoy have been rather more successful with sound quality. Coupled with a well matched Musical Fidelity A1000 and Pioneer PD-S901, the D500s immediately took on the ‘big speaker sound’ reminiscent of their bigger brothers.

Material from William Burroughs’ ‘Words of Advice’ showed the Tannoy to have prodigious bass; the dual-concentric unit gave high levels with little strain.

Another dual-concentric strength, that of imaging, was also excellent for such a speaker. William Burroughs sounded suitably morbid, but had superb presence, maintaining his distance from the rest of the mix. The Miles Davies style brass backing was similarly un compressed, being given the dynamic range it needed.

There was a downside to their dynamic and spacious soundstage, though. Tripping Daisys’ ‘Blown Away’ had rather too forward a balance.

Worse was a clouded upper mid-range that I haven’t experienced on a Tannoy Five or D series dual concentric before. This had the effect of congesting the vocals slightly.

**MEASURED PERFORMANCE**

The dual-concentric driver that Tannoy use measured best slightly off axis. This is interesting, since in the past when listening to their dual-concentric drivers, I’ve found them a little sharp when directly facing the listening position, and smoother when firing straight down the room.

The two response plots below show the difference. On axis the response is basically flat, but there is an obvious dip around 4-5kHz. A few degrees off axis, and the dip is starting to fill in quite substantially, which will give a smoother sound with the treble becoming less obvious.

The rest of the response, as I mentioned earlier, is essentially flat with the bass just starting to lift slowly towards the bottom end. I’d expect the D500s to have solid and weighty bass in most rooms.

Like the D700s and D100s, the new D500s are sensitive, producing 90dB sound pressure level for a nominal watt (2.83V) of pink noise measured at 1m. This means that they will go louder than most for the same volume setting. But, like the D700s, they have a crippling impedance, hinted at by their low overall figure of 4.8Ω. It starts low in the bass, around 3Ω and then rises to 35Ω through the midband, finally dipping again to around 6Ω at 20kHz. To drive the D500s properly in the bass, they’re going to need a powerful solid state amplifier that can drive low impedance loads well.

In summary, the D500s have a well mannered frequency response and will sound at their smoothest when firing directly down the room either side of the listener. Like the D700s, they are difficult to drive, needing a powerful solid state amplifier to get the best from them. Most integrated amplifiers will struggle with them. A high quality independent power amplifier is likely to give best results. DB

**Frequency Response - on axis**

In summary, the D500s have a well

**Frequency Response - off axis**

**Impedance**

Apache Indian’s ‘Moving On’ demonstrated the D500’s effortless dynamics, which seemed at odds with their harshness in the upper midrange. The general effect was engaging though, despite bass notes occasionally hanging around longer than they should. Vocals had fine projection, if occasionally some edginess.

As flawed as the D500s are, they do have their niche. Used in a room of reasonable proportions (to avoid the midrange experienced in smaller rooms), and matched with warm sounding ancillaries, they offer the perfect tonic for a dull system.

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Noel Keywood goes in search of vintage audio at this year's NVCF '94, held at the NEC, Birmingham.

In spite of the title, I didn't drive to Birmingham to pick up an ear trumpet. Not that the Vintage Communications Fair doesn't have them; I saw plenty of gramophone horns - their acoustic cousins - as well as benches full of old radios. No, my quest was for the old hi-fi that’s seeping into radio meets’ these days, due to its steadily increasing popularity. The grapevine had already told me there'd be plenty of it - and there was.

The National Vintage Communications Fair is held in Britain's National Exhibition Centre (NEC for short). It's a one day event that occupies a large hall and casts its net wide. Old radios abound, from 1920s Gecophones through to 1950s Pyes. There are vintage televisions, juke boxes, cine cameras, telephones - even vintage light bulbs!

Although still very much a 'Crafts' fair, drawing dealers and private collectors alike, all selling from trestle tables, the NVCF is obviously becoming popular. "I travelled up by coach at 4 a.m. this morning, but an American dealer had flown in and beat me to a rare book I was after" a frustrated collector told me. "This fair is very convenient for me" said Frédrich Kammerzelt. "I can fly in straight from Munich - and already I have bought many rare valves and some Leak amplifiers. There are some real bargains here".

The rising popularity of the NVCF was borne out by the jostling crowds, stands with vintage hi-fi attracting a lot of attention, I noticed. There were plenty of Leak and Quad amplifiers, a box of Quad tuners (£10 each as seen), a couple of Garrard 401s loafing around on the floor (£65, £120), a 19 valve Fisher 800C receiver (£250), rare Pye amplifiers (£450) and an even rarer Leak TL 25.

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50 BRIDGE STREET 061-832 0888
lot of different people and a meeting of technologies” John Howes, stallholder and sorter of the Audio Jumble, told me. This aspect of the NVCF had struck me too. I’d never met Len Kelly before, who runs a shop called “Hobby and Heritage Directory for Collectors of Sound and Vision” in Tiverton, Devon.

John Howes enjoying the interest. He brought along, amongst many classic audio items, Pye HF2S 25 watts output power amps. “They’re rare - you don’t see many around!” (£450 restored). Also on display were RCA New Orthophonic power amps, Quad IIs and Quad tuners to dispose of “as seen” at £10 each, plus much more. Tel: 0892-540022 for details on next Audio Jumble.

A brace of small Eddystone radios, from the factory museum. For Eddystone User Group, sales, service, spares: Tel: 021-475-223.

Jim Fish of Wilson valves: “Business is excellent; the resurgence in audio amps is staggering. We are exporting right around the world, to South Africa, Canada, Hong Kong - even China.” Tel: 0484-654650/420774 (Huddersfield)

(Tel: 0884-256170) specialising in Broadcasting and Communications books from all periods and parts of the world. He had a wide selection of audio books from the late Donald Aldous’ collection, many signed by their authors.

I was taken aback to see a collection of Eddystone radios, having set out recently to find out more about this company (in my teens I built a few of these, complete with Mullard 3 watt valve amps (single-ended no less) and EMI full range elliptical loudspeakers, just to prove a better sound could be had if the job was done properly (old habits die hard!). “Nobody is interested apart from me it seems” Adrian Parker told me (contact him on 0922-479849). “I’ve got 300 or so record players at home. Some of the best record players I bought along today have gone already, including a miniature Cossor, an EAR and a Pye Black Box”.

An interesting 19-valve Fisher receiver in full working order, plus numerous other items, had been brought up from St Ives, Cornwall by Stan Halfyard, an enthusiast who had taken a stall just to clear his house of unwanted bits and pieces (Tel: 0736-798393). I came across many stalls like his, piled high with hi-fi bric-a-brac, including both restored and original condition items. “Some people want to have something restored and working, others want originals for the purpose of restoration” one stall holder told me.

With three sizeable restaurants serving this one hall, as well as drinks and snacks trolleys being pushed around through the crowds, the NFC looked to be a fine venue for any show. Organised by Jonathan Hill, author of the Cat’s Whisker (well, that’s the one on my bookshelf), the NVCF will be held again at the Pavilion in the NEC. It is scheduled for Sunday May 14th 1995. There’s now also a “Hobby and Heritage Directory for Collectors of Sound and Vision, pre-amps, plus a Garrard 401.
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- Kenwood KA1020
- Technics SA6001C
- Marantz PM514
- Pionner 3400K

**Speakers**
- Technics SL1020: 226.85
- Kenwood KA1020: 273.95
- Technics SA6001C: 296.95
- Marantz PM514: 319.95
- Pioneer 3400K: 335.95

**CHOICES**

The following Compact Disc Player or Turntable may be ordered instead of the NAD S120 in the above systems -

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- AIWA XC-300 Add £29
- Denon DCD265 Add £59
- Goodman's GC-960 Add £0
- Goodmans GC9050 Add £9
- Marantz CDS26 Add £79
- TEC CP9350 Add £79
- Marantz CDS505E Add £169
- Technics SL-P940 Add £59

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- Dual CS502: 2 Add £69
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Denon P HA580 £299.95
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NAD 304 £239.95
NAD 305 £299.95
NAD 306 £399.95
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Pioneer A500X £299.95
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Quad 66A £299.95
Quad 306 £399.95
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Rotel RB 70 £249.95
Technics SUA 600K £199.95
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MINI/MICRO SYSTEMS
Aiwa, Denon, JVC, Sony, Technics Refer to our Mini/Micro Ad P.O.A.

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NAD 705 £359.95

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Aiwa ADF 810 £159.00
Aiwa ADF 850 £229.95
Aiwa ADW 627 £169.95
Aiwa ADX 628 £199.95
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Denon DR 650 £249.95
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Marantz 526 £299.95
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Nakamichi DR 2 £599.95
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Philips DCC 600 inc C/B £228.00

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OVER FOR FULL DEALS!
Slipping in just below the £1000 mark, the Orelle SC-200/SP-I50 amplifiers could be a popular choice for audiophiles looking to upgrade their trusty integrated to their first pre/power amplifier. The competition is getting tough between £400-£600, where super-amps such as the Audiolab 8000A, Sugden A21a and many others firmly sit. Similarly priced pre/powers can't match their performance, the cost of the extra box stealing funds from what's placed inside. So, pre/power amplifiers are sliding upwards in price to get away from integrated competition.

However, at this higher price level, pre/power amplifiers are given the design space they need. Instead of skimping and saving to keep the price low, extra goodies are added to persuade buyers that they are superior to the mass of integrateds available for a few hundred pounds less.

These goodies are aimed at the audiophile on the Orelle. There's no headphone socket, tone controls, 'speaker switching etc., but inside there is a wealth of quality components. Silver plated switches, Alps volume control, Holco precision resistors in critical places, polypropylene capacitors and van den Hul cable for the 'speaker outputs of the power amplifier.

Externally, these amps look suitably minimalist too. The power amplifier has just a power switch, the pre-amp. adds volume, selector and tape monitor controls to its similarly sparse front panel. The casework is attractively styled: the deep curve of the facia, the shelf at the bottom and the domed control knobs add dimensionality to the front panel. Orelle use Arcam style construction comprising extruded alloy front plate with pressed steel case, to remain competitive, but they achieve a slightly sturdier product.

Around the back of the pre-amplifier is a line of gold plated phono sockets giving the SC-200 five line inputs, a tape monitor and optional MM or MC phono input. Ours came in standard line level only configuration, but the MM board can be added for just £29 and MC for £64, which seems very reasonable indeed.

Orelle also provide both active and passive outputs, giving the SC-200 great flexibility. For high output sources such as CD, and where a short interconnect between amplifiers is used, the passive output avoids the components of the main circuit, simplifying the signal path.

But, say you wanted to used a low output source, such as a Leak Trougline, into an insensitive power amplifier, the SC-200 has enough gain in active mode to cope with the task.

The power amplifier uses good quality gold plated phono sockets and chunky gold knurled binding posts. There is only one set though, so for bi-wiring the side entry holes may have to be used. The power amplifier uses MOSFET transistors to give it a healthy 75 watts output (Orelle's conservative figure, see Measured Performance), so it should be able to drive most 'speakers to high levels, even those with very low sensitivity.

I left the Orelle overnight to run in, the pre-amplifier had done the rounds with other journalists, but the power amplifier was brand new. As a good solid state reference I used our trusty Audiolab 8000C with 8000M monoblocks, a little more expensive, but of similar power output.

I hooked up the Orelles using the passive output on the pre-amp first, which
proved to give plenty enough output to drive the SP-150 from CD. In fact, I found that the SP-150 could drive every ‘speaker

It was tuneful too, possessing enough grip to allow volume to be edged upwards further and further without it losing control of the ‘speakers. This is an amplifier that you could really party with.”

I tried to very high levels without strain, the bass always having terrific control and punch.

There was a lightweight quality to the midrange and treble that is possibly the result of the pure sounding, high quality components used. It isn’t exactly a thin sound; but it did lack a bit of warmth and body, especially with CD. But vocals were smooth enough and free from any roughness.

Primal Scream’s ‘Movin’ on up’ from the album Screamadelica has a lot of high frequency percussiveness on it, which became splashy and vague at the top. It wasn’t harsh or uncomfortable in any way, just confused. ‘Damaged’, with its simpler, more delicate treble, managed to hold together much more cohesively, the treble becoming sweeter and smoother as the pressure relaxed.

With less processed programme material the Orelle scored more at home. Frank Black’s ‘Sir Rockaby’ from his new album had a terrifically deep and weighty bass line. It was tuneful too, possessing enough grip to allow volume to be edged upwards further and further without it losing control of the ‘speakers. This is an amplifier that you could really party with.

When compared directly with the Audiolab the Orelle scores very highly. It was free from the slight coarseness or grain that the Audiolab has through the upper mid and treble, only becoming confused with frantic percussion. The sound stage wasn’t quite as wide open as the Audiolab and was limited in stage depth, but it’s finely focused through the midband, giving a clearer picture of the performance. The Audiolab is fantastically dry and well controlled in the bass, but the Orelle has the edge when it comes to absolute bass depth. It also has more richness at the bottom end, giving it an easier character to listen to over long periods.

Switching over to the active outputs of the pre-amplifier, the Orelle lost a little of its civilised approach through the midband and developed a hint of grain in the treble. It was still cleaner than the Audiolab, but the margin had narrowed.

The sound did become a little more up tempo though, with a little more punch in the upper bass adding pace and attack.

BMX Bandits ‘Scar’ had real slam. The jangly and cold sounding electric guitars projected through the mix and were given superb clarity, the impact of the kick bass leapt from the ‘speakers. And in a different style, Grant Lee Buffalo’s ‘The Hook’ was clearly focused and incisive in its delivery. The passive option is definitely the smoother one, but the forwardness and the way detail is forced at you in active mode I found impressive.

The Orelle SC-200/SP-150 pre/power doesn’t have quite the same magic of the Sugden A2 1a, or the wide range of facilities of the Audiolab 8000A, but it does have plenty to offer all the same. This combination has enough power to drive almost any loudspeaker up to party levels, it is smooth and detailed enough to satisfy all but the most serious audiophile, and it is competitively priced. Steer clear of loudspeakers with sharp treble and the Orelle should create a very powerful and rewarding sound.

SC-200 £399
SP-150 £499
Orelle Hi-Fi
Unit 11, I-MEX House, 6 Wadsworth Rd, Perivale, Middx. UB6 7JD Tel: 081 810 9388

MEASURED PERFORMANCE

The SP-150 MOSFET power amplifier had a healthy output of 100watts into 8ohms, enough to make even insensitive loudspeakers go loud. Unlike some UK MOSFET designs, this one could swing current into a low four ohm load without thermal limiting, making it suitable for all loudspeakers, not just high impedance types. Output rose little to 110watts though, due a significant drop in maximum output swing, suggesting mediocre power supply regulation. All the same, the power amplifier has plenty of volts to swing across high impedance UK loudspeakers in particular, which commonly measure around 100ohms. These need volts more than current. However, there was little change in overall distortion level with the increased current demand of a four ohm load, a good sign. The SP-150 has plenty enough muscle to handle a wide range of loudspeakers and make them go loud, even in a large room.

Downward extension of frequency response was good, reaching 4Hz - plenty low enough to reproduce subsonics from CD. At the top end output was maintained up to 68kHz, high enough to avoid any warmth in the sound. Over this wide bandwidth distortion was low, even at high frequencies, reaching 0.02% maximum. This avoids obviously sharp treble, but the presence of odd-order harmonics (3rd, 5th, etc) suggests high feedback around MOSFETS of mediocre linearity, which may singe the treble a little.

Low noise and satisfactorily high input sensitivity figures were achieved, together with low d.c. output offset, the only problem here being some d.c. ‘bounce’ of up to 60mV when the volume control was moved. If this control is within a d.c. feedback loop, it needs to be taken out. However, since volume is not constantly on the change whilst listening, the amplifier should be stable enough in use.

With good reserves of power, low distortion and wide bandwidth, the SC-200/SP-150 amplifier combination should give a good account of itself. Its exact sonic character can only be established in listening tests. NK

TEST RESULTS

<table>
<thead>
<tr>
<th>Power</th>
<th>100watts</th>
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<tbody>
<tr>
<td>CD/tuner/aux.</td>
<td>4Hz-68kHz</td>
</tr>
<tr>
<td>Frequency response</td>
<td>74dB</td>
</tr>
<tr>
<td>Separation</td>
<td>-94dB</td>
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<tr>
<td>Noise</td>
<td>0.005%</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>240mV</td>
</tr>
<tr>
<td>dc offset</td>
<td>5mV</td>
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</tbody>
</table>

Distortion

0.1% 0.2% 0.5% 1% 2%

0Hz 1kHz 10kHz 60kHz
THE BEST - QUAD IIs

I'm glad to find a magazine that seems to be genuinely interested in discussing products that offer true high fidelity, irrespective of their price, vintage or apparent credibility.

Recently I have had cause to replace an old pair of Magneplanars with some overbearingly large horn speakers from Living Voice, and in the pursuit of an amplifier to work with them (anything will drive them since they have a sensitivity of 104 dB/v) I have had the opportunity to try a very large number of highly regarded pre and power amplifiers within a relatively open budget. I have eventually settled on a pair of Quad IIs, using original KT66 valves, which I purchased for the princely sum of £225.00. I have heard nothing that comes close, even when listening to amplifiers costing over 20 times that amount.

Other high fidelity, low cost items I use include the excellent Syrinx PU2 Gold arm (yes I know it's a bugger to set up), Croft Micro A pre amp, and Audio Innovations 5800 MC Transformer (preferable even to Audio Note silver types).

Unfortunately I have yet to find a cartridge to compete with my Koetsu.

So what is the point of my letter? To encourage those readers who still think that Hi-Fi as a subject can and does need to appeal to a broad church. Not everyone has infinite amounts of cash to throw around and, as you usefully illustrate, money is no arbiter of quality in any case. This gives everyone a chance to enjoy music, including the impecunious (as contributor Richard Kelly would say of those who are skint!).

I've owned Quad 22/11s and they certainly are sweet but, lacking 104dB/vV loudspeakers I had to part with them, 12 watts being just too little at the time. (This was in the 1980s). Hopefully, loudspeakers will evolve to offer higher efficiencies in future so more people will have a chance to savour the delights of low powered amplifiers like these.

PRIZE PRIZED

May we take this opportunity to thank you for the superb CD based system that we won in the January issue of Hi-Fi World.

Please accept our apologies for not writing sooner but, as you can imagine, since setting up the system every spare moment has been spent re-evaluating our CD collection. What better way to spend an evening the listening to real hi-fi as selected by professionals rather than just reading about it? At last my wife and I are able to sit back in the knowledge that the system has been chosen for 'sound' rather than for the number of items within a certain budget.

Our original system, comprising Sony separates together with Wharfedale speakers, produced what appeared to be a reasonable sound. However, on hooking up the prize system the quality was immediately apparent. The clarity and attack stood out, the bass, whilst not appearing to be as extended, could actually differentiate between the notes being played. Subsequent A/B tests clearly show our original Sony set up to suffer from a boomy, muddy bass line which tended to fill the room rather than display what was actually being played.

For your information we are currently using Tandy gold interconnects, Monster cable and Apollo CKD 24 stands spiked top and bottom. In our opinion these feel sturdier than the Target stands as featured in the article. Our local hi-fi shop, Fanthorpes of Hull, allowed us to compare both makes and were extremely helpful in all areas. This together with absolutely no pressure or hard sell was a very refreshing occurrence.

With regard to our musical tastes, these centre around rock groups such as Marillion, Tom Petty, Level 42 and Joe Jackson, the latter producing most of his CDs in DDD format which together with Paul Simon's 'Concert in the Park' show what the system is capable of producing. The latest Marillion release 'Brave' really allows the Missions to display their bass handling ability, which is quite amazing for such small speakers.

DISC TROUBLES

Until reading 'Not Fade Away' (Hi-Fi June '94) I considered the bronze patina on some discs rather fetching. All that glitters is not gold. Another illusion bites the dust.

A careful inspection of my 408 CDs revealed 19 discs with the pretty bronze effect we now know to be rust. Eleven discs are clearly identifiable as PDO pressings. Eight have similar inner ring codes, but do not carry the PDO legend. The record companies vary, but the most common (in my collection) affected labels are Academy Sound and Vision (ASV) and Decca. All discs were bought between November 1991 and April 1994. I have no way of knowing when they were pressed. At least 9 PDO pressings are unaffected.

All the discs still play, but I cannot compare sonic quality as I have no control duplicates. Just 19 out of 408 does not seem too bad until you realise that it represents an investment of some £228. If your conclusion is correct then I will possess, in time, a pretty, but expensive collection of metallic doughnuts! It has been suggested that I convert...
All that remains now is to sit back and let the music drift over on us whilst reflecting on our extreme good fortune. As for the Sony separates, they still supply disc, tuner and cassette facilities and may well be upgraded to provide Dolby Pro Logic with the addition of a suitable decoder in due course.

Graham and Jillian Douglas
South Humberside.

I'm very pleased that you enjoy your prize. It just goes to show that real hi-fi can be bought for as little as £700. Readers might like to know that the system comprised Yamaha CD-X570 CD player (£240), Rotel RA-935BX amplifier (£199) and Mission 760iSE 'speakers (£149.90). The three components were selected for sound quality, not for looks, convenience, styling etc, so we are pleased that you agree this criterion was met. Part of the point behind the Systems Test was to stress that proper hi-fi can be as affordable as a midi-system, but offers superior sound quality. I hope you continue to enjoy your new system and never consider buying a midi-system again!

DB

I have really enjoyed your enthusiastic and varied read, the Month

especially Dominic Baker's evolution with Quad electrostatics and valve equipment. I'm waiting for Dominic to discover Tannoy's Monitor speakers.

This brings me to my reason for writing. I wonder whether you would be interested in reviewing my Leak Stereo 60 amp. It has a passive pre-amp attached to blend with the Art Deco style, all chromed with black transformers. It is the best valve amplifier I've had (and I've had a few). It sounds great through my 15" Tannoy Gold Monitors.

I also have a very mint Garrard 301 which gives a superb dynamic range, as well as a recently-serviced Nakamichi LX5 cassette deck; I keep trying other items such as Marantz CD-54 and the wonderful HEW samplers.

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I would like to completely endorse your review of the NAD 402 tuner. I've bought one and think it is better than my old Revox B261 tuner (I sold the Revox to buy valve equipment).

I am disabled and cannot afford esoteric prices, however, I believe that my system would give any other a good run for its money.

David Hirst
Earlsdon, Coventry.

Every day the postbag arrives with more letters from people in a similar situation to yourself. Most were once avid hi-fi enthusiasts, building their own valve amplifiers, modifying turntables and constructing loudspeakers, but they quickly vanished - or so it appeared. I suspect the arrival of seemingly high quality hi-fi at affordable prices from Japan and a lack of enthusiasm for anything other than black-box reviews by U.K. magazines were major factors in this. I can't tell you how pleased we are continued on page 45...

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SONY Metal Vertex

EX TIM NNW DINAMIC MASTER, I nw, John, te AvrYPE OEM,. PI.4/10.1 VII AIII AIT A ASSI ITi IKILL A, thhAPLI

Mastering Metals

Are Super Metals worth the extra cost over standard metal tapes? Noel Keywood tests five of the very best blank cassettes.

Sony's extravagant claims for their new Super Metal Master tape caught my attention. With DCC and MD sales stagnant, emphasis is returning to the cassette. Could a new super-metal like Sony Super Metal Master lift cassette performance up to a level approaching that of DCC and MD? Is this what we should look toward for the immediate future?

Whilst I was interested to see if Sony Tape, who have consistently turned out a good product, had produced something really special in Metal Master, in the back of my mind I was aware that it would most likely rival, but not significantly improve upon other premium metals, like TDK MA-XG and Maxell Vertex.

Aware that even a normal metal tape like TDK MA at £2.75 or thereabouts looks severely expensive to most buyers, I decided to broaden this report to show how a 'cooking' metal like MA compares with Super Metals, to reveal what the £8 or so difference between them provides.

But since only those with pockets deeper than the Mariana Trench will be enthralled, Maxell's rival to MA, Maxell MX, was included too, to see how effective it's become.

Conveniently, TDK have just reformulated and improved MA and the International Electrotechnical Commission (IEC) have just released a new standardised or benchmark metal tape (IEC IV) to which cassette decks should, ideally, be factory adjusted. So there's plenty of activity in this field at present, but does it add up to much as far as the impecunious buyer in the street is concerned?

Modern metal tapes are, these days, superior to ferrics and chromes by a significant margin. In particular, they give clearer and better defined treble. Where early metals often sounded brittle and coarse, today's metals can provide sweet and especially smooth treble. In fact, they are beginning to pull ahead in all areas of performance; cassette decks are barely able to keep up. With a good deck though, from my own experiences with a Nakamichi ZX-9 and, of course, more metals than Rio Tinto Zinc, I can assure you that they really do give fine recordings. Similar results can be obtained with an affordable £500 Nakamichi DR-2.

Now back to the new Sony Metal Master.
SONY SUPER METAL MASTER

I used the new IEC IV Primary Reference Tape (manufactured for the IEC by TDK) and set bias to a level commonly found in commercial recorders (+4dB). This means the test results show what you would experience if you recorded on Super Metal Master on a conventional cassette deck without first bias tuning to match it in.

Its frequency response has steeply rising treble, +4dB up at 20kHz. This is far too much treble to be acceptable, so a deck with adjustable metal bias is a must. Otherwise, apart from excessive treble, Super Metal Master at this bias has high overload margins (MOLs and SATs), very low tape hiss and ultra-low modulation noise. So in essence it is a super tape, but it won’t work properly on boggers recorders.

So you shouldn’t use a tape like this without tuning it in to flatten treble - and here’s where we sail into problems. Until a year or two ago, only Nakamichis had variable metal bias and even now, few decks have enough variation to cope with a tape whose properties are so extreme. So, chances are, you’ll need a Nak. to use Sony Metal Master.

No problem, I hear you say, I have one/will buy one tomorrow. (Recession - what recession?) Bias will have to be increased to get response flat, but this also raises midband overload (MOL315Hz) and lowers treble overload (SAT10kHz), changing overall tape performance. All the same, the advantages and drawbacks of Metal Master then become more

<table>
<thead>
<tr>
<th>TREBLE LEVEL</th>
<th>SONY S.M.M.</th>
<th>TDK MA-XG</th>
<th>MAXELL VERTEX</th>
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<tr>
<td>10kHz</td>
<td>1.2</td>
<td>0.6</td>
<td>0.8</td>
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<tr>
<td>Overload</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mid-band (MOL315Hz)</td>
<td>5.2(7.5)</td>
<td>6(7.2)</td>
<td></td>
</tr>
<tr>
<td>Treble (SAT10kHz)</td>
<td>1.8(1.4)</td>
<td>2.8(1.5)</td>
<td></td>
</tr>
<tr>
<td>Hiss</td>
<td>-59</td>
<td>-59</td>
<td>-58</td>
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<tr>
<td>Modulation noise</td>
<td>-59</td>
<td>-43</td>
<td>-48</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0</td>
<td>+0.5</td>
<td>+0.5</td>
</tr>
<tr>
<td>Dynamic range</td>
<td>64.2(66.5)</td>
<td>64(66)</td>
<td>64(65.2)</td>
</tr>
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All figures are dB; high bias results in brackets.

Test notes: Recorder - Nakamichi ZX-9; IEC IV Primary Ref. tape - MJ507A; metal bias - +4dB (+5.6dB); hiss IEC A wtd.; Ref level - IEC 0dB; mod noise - band noise from 1kHz-3kHz stimulated by 3150Hz tone at 0dB. Tests substantially to IEC 94, made on Hewlett Packard 3561A FFT.

Sony Metal Master has strong treble lift that needs to corrected with an adjustable bias control.

Less treble lift and flatter response makes both MA-XG (left) and Vertex (right) more compatible with a wider range of cassette decks.

Even when bias is adjusted optionally, the Sony dual-layer tape gives a wonky response.

Increasing bias gives a flat response to both MA-XG (left) and Vertex (right).
obvious. Our analysis shows that, like many dual-layer tapes (remember fern-chromes?), this one has a wonky frequency response, one with a dip in the middle, that cannot be made flat by bias tuning.

That's the major drawback of going for dual layers. The benefit is the highest overload level of any tape on the market - +7.5dB (MOL315). Combine this with super low hiss and modulation noise and you have a tape with the highest dynamic range, no less than 66.5dB (MOL315-hiss).

So Sony can justifiably claim Super Metal Master is the best - it beats everything - providing you don't mind its cum response and the need for a super deck, like a Nakamichi.

The only other observation I ought to make is that it would be possible for Sony to provide a special Metal Master tape option on their top decks where appropriate bias and record equalisation (for flat frequency response) were manually switched in. This would greatly facilitate its use.

TEST RESULTS

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<th>TDK MA-XG</th>
<th>MAXELL VERTEX</th>
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<tr>
<td>Treble level (10kHz)</td>
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<td>0.1</td>
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<tr>
<td>Overload</td>
<td>5.4</td>
<td>5.4</td>
</tr>
<tr>
<td>mid-band (MOL315Hz)</td>
<td>2.8</td>
<td>2</td>
</tr>
<tr>
<td>treble (SAT10k)</td>
<td>-57.6</td>
<td>-58.2</td>
</tr>
<tr>
<td>Hiss</td>
<td>-42</td>
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<tr>
<td>Modulation noise</td>
<td>63</td>
<td>63.6</td>
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<tr>
<td>Sensitivity</td>
<td>0.5</td>
<td>0.5</td>
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<tr>
<td>Dynamic range</td>
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With MA-XG and Vertex, both TDK and Maxell have, respectively, shied away from producing a tape with a frequency response like Sony's Metal Master. In consequence, their performances fall a little short, albeit by marginal amounts, but their compatibility is superior. Both offer a flat frequency response when tuned in (by increasing bias) and a similar dynamic range, 66dB with MA-XG and 65.2dB with Vertex. MA-XG has super low hiss (bias noise) but Vertex runs very smoothly, possessing super low modulation noise.

I have to say that from experience I find Vertex incredibly neutral, smooth and sweet sounding in the treble, on my ZX-9; it's my preference. TDK MA-XG is a little grainier and Metal Master tonally odd because of its non-flat frequency response. I tend to use Vertex with Dolby B (75dB dynamic range) or Dolby out, according to source quality, since noise reduction can compromise quality a little.

BUDGET METALS - TDK MA & MAXELL MX

But you probably don't want to spend so much on a blank tape. You don't really need to either, because new (reformulated) TDK MA - the market leader - and new (also reformulated) Maxell MX offer superb value and I'd recommend anyone to try them. Both are highly compatible in that they give a flat frequency response identical to that of the new IEC IV Primary Reference Tape. Tune them in and they'll sound tonally neutral.

Both also have very high overload margins at normal metal bias levels and both now have low hiss. TDK MA has a dynamic range of 63dB and Maxell MX 63.6dB, with MA possessing the slightly brighter sound. These tapes are really good value. They have 3dB less dynamic range than super metals, but around 3dB better dynamic range than most ferrics and chromes in the midband and around 9dB at 10kHz. It's an audible advantage and, for serious tapeists, possibly worth the extra. ●

Maxell UK Ltd.,
3a High Street,
Rickmansworth,
Herts. WD3 1HR
Tel: 0923 777171

Sony Consumer Products Ltd.,
Sony House, South Street,
Staines, Middd.
TW18 4PF
Tel: 0784 467000

TDK UK Ltd.,
TDK House,
5 - 7 Queensway, Redhill,
Surrey RH1 1YB
Tel: 0737 773773

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<th>Light Metal Loudspeakers</th>
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Address: ................................................................................................................ Postcode: ..................................................................
...continued from page 39

at Hi-Fi World to see so many enthusiasts, who have been ignored for the last twenty years or so, still alive, Home Cinema, etc. NAD have been busy selling 402s hand over fist. It is good to know that the UK still responds to quality hi-fi.

We would love to review the correct bias adjustment for cassette that seems so important in your technical reports, when recording onto differing brands of tape. I bet a lot of readers would welcome involved in their hi-fi and its performance, making it a more enjoyable leisure time activity. But it is difficult to know how many times, or how often, to feature such articles. Setting up cartridges and recording bias are topics that have been covered over the last few years. We understand that you may have missed them, but many regular readers won’t have. There are two solutions however: Give us a call and we’ll send you the relevant back issues, or write to us, asking how you would, say, fit a moving coil cartridge to a Rega arm, and we’ll answer it in the magazine for you. If we get enough queries from readers, we’ll have a HOW TO section, where you can ask anything about setting up your hi-fi. DB

NOVICES
How about a page every month dedicated to relative novices, like myself, on everyday maintenance/tweaking, e.g. fitting a new cartridge and the technical details that one needs to know in order to get the best out of the equipment without damaging records - fitting a replacement tone-arm even.

And what about achieving a column of this type as not everyone has the knowledge or the experience to carry out the aforementioned tasks that you may consider the norm. Perhaps a page per month is a little too much to hope for, but there must be quite a number of jobs that hi-fi owners usually get their dealer to carry out, but if they are shown how, might consider themselves. Also, more group tests, budget equipment, accessories. (I know, you've heard it all before!)

Keep up the very good and impressive work – we need you as much as you need us!

Derek Anderson
Kirkcaldy,
Fife,
Scotland.

The articles you suggest are very important, because they allow readers to become involved in their hi-fi and its performance, making it a more enjoyable leisure time activity. But it is difficult to know how many times, or how often, to feature such articles. Setting up cartridges and recording bias are topics that have been covered over the last few years. We understand that you may have missed them, but many regular readers won’t have.

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REEL THEATRE
I am on holiday here from Australia and I have had an interest in hi-fi since the mid 50’s, so I was delighted to read letters of the calibre provided by your contributors. I am not a formally trained technical person but I have several items of hi-fi equipment – both valve and solid state – for most of which I have service manuals. Over the years I have built a signal generator, and a millivoltmeter. I have also bought an ‘el cheapo’ oscilloscope. With these basic tools – plus hours of patience which a properly trained person would not need, (nor could he afford!) I can usually locate and replace naughty components which sometimes make their unwelcome presence known in my equipment – none of which has any real relevance to the purpose of this letter, but I just love to tell anyone who will listen!

I have owned a Vortexion W.V.A. tape recorder for over 30 years. I have a Vortexion C.B.L (over 20 years) 3.5 watts per channel with which I continued on page 47...

Selling hand over fist: NAD's 402 tuner.
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For the best in Hi-End hi-fi Bury Audio is a must. All the names stocked are individually chosen to complement one another to give the best sound in their class. To get the best from CD there are DAC’s like Pink Triangle - Da Capo or Ordinal. Great sounds now can mean good looks too thanks to Michell - Iso, Argo, Alecto. Now, Gyrodec sounds better still with the Tesserae - Tags psu. Valves from Tube Technology - Unisys. For fanatics, Musical Fidelity - F22 and F15. Open natural sounds from LFD - PAO, LSO, MMO. Stunning to look at and to listen to the new Ruark - Equinox. These are just a selection of the impressive sounds on demonstration now. Why not come in and have a listen to the best sounds in East Anglia.

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Cheques and postal orders should be made payable to Tabula Rasa. Trade prices available on request. 30 days money back guarantee offered on all drivers & kits.
...continued from page 45

have been filling a small theatre (120 seats) with music and sound for over 20 years – shades of Mr Boardman’s letter in the Supplement! I have a Ferrograph 634 and a Ferrograph Series Seven, both picked up 2 years ago for the ridiculous price of $75 each! Both complete with the excellent Ferrograph Manuals, and the 634 even has a spare motor for the capstan!

Finally, a question. If there is a Ferrograph Owner’s Club still in existence in the U.K. would someone let me know so that I may apply to join before I return to Australia in June. Thank you so much.

G. S. Sollors
Port Talbot,
West Glamorgan,
South Wales.

I wrote directly to Mr Sollors so that he would receive this information before he left for Australia, but here is the reply for any other interested readers. DB

You’re in luck. There isn’t an owners club as such, but Ferrograph are still going strong in the UK. They have contact names for many Ferrograph owners and collectors, and are willing to put them in touch with each other. You can contact them at:

Ferrograph Spares & Service,
Suite 7, Cookson House,
River Drive, South Shields,
Tyne & Weir. NE33 1JX.
Tel: 091 427 7774

LINE PROBLEM

I would like to make some comments regarding the review of the Castle Howard speakers.

How Dominic Baker can say that Transmission Line bass is similar to Quarter Wave loading seems to me ridiculous. The Transmission Line has a long path that is filled with acoustically absorbent material, which absorbs the rear wave of the drive unit, eliminating any sound of the cone from the rear, this usually being a very inefficient type of enclosure. Quarter Wave loading, on the other hand, is a type of horn enclosure and uses very little damping, usually a small amount in the top of the tapered line. Acoustic pressure is high at the drive unit and small movements of the unit manifest in much larger movements of air at the port out of the bottom of the enclosure. This type of enclosure tends to be very efficient.

Ivor Humphries in Gramophone gave a very favourable review to the Howards comparing them to the Quad ESLs, showing drawings of the tapered pipes (there are two) and also gave a little background history of Quarter Wave loading. I would like to finish on a less critical note and thank Richard Brice for his headphone amplifier, but could he publish a power supply unit for the design in the near future?

Derek Hooper
Warley,
West Midlands.

I agree that the theoretical transmission line is so long and so well stuffed with absorbent that no sound comes from the end of the line, but I can’t think of one practical transmission line ‘speaker’ that could claim this.

In the real world the line is short, lightly stuffed, and the output from the line is actually used to add to the low frequency output of the ‘speaker’. I say that the Quarter Wave loading used by Castle is similar in principle to this: i.e. the output from the 1/4 wave horn is used to add to the low frequency output of the ‘speaker’. Subjectively, the effect is very similar.

I didn’t want to confuse or mislead readers by suggesting that the Howards were horn loudspeakers, because they definitely are not. We aim to explain things in a simple and understandable manner, so I’m sorry if this simplification confused you.

The answer to your final query is yes, look in this month’s supplement. DB

There is a link between quarter-wavelength loading and the transmission line. Any practical implementation of a transmission line can be regarded as a hybrid of various operating principles. At higher frequencies the upper chamber acts as an infinite baffle, but as frequency declines the ‘line’ acts as a quarter wavelength pipe and, later, as a non-resistive reflex port. A theoretical transmission line would have a falling bass response, as Mr Hooper points out: ‘very inefficient’ (in the bass). It is the ‘tuning’ of the line that sustains its efficiency to very low frequencies.

In its simplest form, a quarter wavelength design can be achieved by placing a suitable drive unit at the end of a straight open pipe. The speaker usually places its drive unit facing into its ‘throat’. This increases efficiency over a wide operating band, but a horn has to be very large indeed to sustain, let alone enhance, bass frequencies.

I trust that this goes some way to clarify the interaction between these operating principles.

John S. Wright,
Managing Director,
TDL Loudspeakers.

LOOKING FOR NEUTRALITY

My main gripe with hi-fi magazines is that there is little indication for equipment that is neutral. I accept that unbalanced systems may require ‘balancing’ with non-neutral components. I accept that there may be no single definition of ‘neutral’ acceptable to all. I also accept

continued on page 55...
WARM WELCOME

Dominic Todd welcomes Onkyo’s smooth sounding DX-750 CD player.

Will it K.O. the opposition?

However good Onkyo’s new DX-750 CD player may be, its price pitches it right into one of the most cut-throat sectors of the market, where £20 either way can make the difference between make or break. Priced at £349.95 the Onkyo faces stalwart competition in the form of the Marantz CD52SEII (£299.95), not to mention the Rotel 965 Discrete (£375) and Pioneer PD-S802 (£349.95). Also, it should not be forgotten that for a mere £50 more there are quality British machines available, such as the Orelle CD 480 and Aura CD 50. None of these players are going to give up their market share without a bloody fight, and for Onkyo to carve out a niche for itself, this player needs to be more than simply competent.

The build quality and warranty get it off to a good start. No other CD player at this price can boast a standard three year warranty, where if the product goes faulty in the first year it is simply replaced. Onkyo are obviously pretty confident about the quality of their machines and the general solidity and slick ‘well oiled’ feel does much to reinforce faith in the product. The build quality is certainly streets ahead of the Marantz, matching that of the Rotel, but with a smoother action to the controls. Although Onkyo UK see the 750 as an audiophile machine (for the moment it’s the most expensive Onkyo CD player available in the UK), this doesn’t prevent it from being laden with gadgets in true Onkyo fashion. On top of all the usual features one would expect at this price, the 750 comes with a non-defeatable three stage dimmer, peak search, variable level and headphone output, optical output, music calendar, time edit, memory reverse, an FTS type music file and no less than 5 repeat modes. In short it’s a button pushers’ dream.

Whether or not it can truly be called an audiophile machine is a different matter. The 750 lacks the special transformers, twin DACs and copper-plated chassis of more expensive, export only, models. However, there are a couple of special features that should provide it with a unique sound. FPCS (Fine Pulse Conversion System) takes the form of a customised digital filter, designed to make a better ‘educated guess’...
As to the value of the missing data, by using adjacent data. The outcome of this is supposedly a warmer and more natural sound, much in the same vein as the Pioneer Legato Link which also tries to emulate analogue sources. So much for CD being ‘perfect sound’. More and more manufacturers seem to be trying to make it sound like vinyl!

Another unique Onkyo feature is the AccuPulse Quartz System, which essentially is an anti-jitter device. Onkyo use their own one-bit D/A converter and die-cast aluminium central disc tray to complete the package.

With the 750 wired up to an Orelle amplifier and Mission 763i speakers, I began by listening to Basia’s ‘Time and Tide’. Despite a slight trace of unnatural sibilance and an ‘edge’ to vocals at high levels, Basia’s voice displayed fine projection and plenty of height too. This feeling of spaciousness was compromised somewhat, though, by the percussion which was a little too ‘obvious’, never seeming to integrate properly with the rest of the mix. This feeling of spaciousness was compromised somewhat, though, by the percussion which was a little too ‘obvious’, never seeming to integrate properly with the rest of the mix. However, this wasn’t a serious problem, and it’s a trait many budget and mid-range CD players are afflicted with. Despite the slightly artificial sounding treble, detail was only average.

On the plus side, the Onkyo never sounded thin or ‘shut in’, with a wide soundstage and good depth filling the room. The ample bass on this particular album was kept under tight control, no mean feat when the speakers involved can be prone to bass ‘bloom’. Dynamics within the music were also crisp, although perhaps not quite as clean sounding as the Marantz CD63. The flip side of this was that the 750 avoided the dryness of sound that can affect the CD63. The Onkyo had a fine grip on the music, and as such was pleasant and relaxing to listen to.

Danny Thompson’s ‘Dargai’ was smoothly presented making it unfatiguing to listen to, but, at the same time, the Northumbrian pipes sounded constrained, almost as though the piper didn’t quite have his heart in it. The double bass had a suitable ‘woody warmth’ to it, but wasn’t quite as extended as it should have been. The 750 has its heart in the right place, though, with all discs tried sounding unprocessed and free from any obvious digital nasties.

The Onkyo had a fine grip on the music, and as such was pleasant and relaxing to listen to.

The Onkyo was confident and controlled with most types of music I could throw at it, although a Freakpower disc did just show up a slight softness in the mid-range, which was noticeable on other discs too when I compared the 750 back-to-back with a Marantz CD63. Otherwise, there was good depth to the sound and vocals sounded natural. As with previous discs, however, this warmth also brought about a softening of the transients.

Overall, sound quality reminded me very much of the Pioneer Legato Link system which is similarly flawed. At times both machines can bewitch as the music ebbs and flows in the manner of a good turntable. Yet, the two systems can also sound artificial, with too tight a grip on dynamic contrasts and occasionally recessed mid-range.

The Onkyo DX-750 is a difficult machine to sum up. For ease of ownership, however, it has to be the first choice with solid build quality, a smart finish and an excellent three year warranty. But other aspects of the machine aren’t quite so simple. The design is neat and can’t be faulted operationally, but at the same time doesn’t have the understated elegance of an Orelle or Aura CD player, for example. The sound quality is a real mixed bag, too. It certainly sounds smooth and expansive, but listening carefully reveals an odd mid-range and a softening of dynamics. This is a machine where a demonstration before purchase is not merely recommended, but vital. In the right system, with the right type of music, the 750 can present a convincing case for itself.
WASH AND BRUSH UP

A wet-and-dry record cleaner, the Nitty Gritty Mini-Pro sweeps Eric Braithwaite away.

A combination of turntable, squeegee and vacuum cleaner, the Nitty Gritty does wonders for record pollution. It doesn’t do a lot for noise pollution - except when its on the vinyl; it sounds like a thirty-year-old vacuum cleaner. This is not a device which allows you to clean one record while playing another. Unless the one you’re playing is a recording of someone hoovering the carpet...

Part of a reviewer’s work, especially for one addicted to vinyl, like me, is getting their hands (and knees) dirty scrabbling about in dusty junk shops and among the cardboard boxes under market stalls. The trouble is that the prizes, good as they often are, tend to be just as grubby as the buyer after this mining operation.

This is where record-cleaning machines like the Nitty Gritty become indispensable - nay, a boon, even. I became nearly as addicted to the cleaner as I am to the plastic it cleans. First off, or rather on to the revolving platter, was a copy of Seiji Ozawa conducting Messiaen’s Turangalila Symphony, found in a cardboard box in a junkshop and moderately mucky and immoderately well finger-printed. Uncleaned, it was nigh-unlistenable, with a high percentage of cracks and pops and a general noise level that would have it banned from Heathrow.

Mercifully, the Nitty Gritty Mini-Pro is a spot more automated than the last Nitty Gritty I had in my hands. For one thing, the cleaning fluid, supplied in a bottle, is pumped up manually, using a plunger, into a narrow trough which wets a velvet-like sponge, rather than being applied with a pad and elbow grease. A dozen pumps were sufficient to wet the LP. For another, a lift-up transverse arm holds a similar pad, so the MiniPro cleans both sides of an LP at the same time. A small platter holds the record, while a
drive wheel, sprung so it applies pressure to the outer edge of the LP, spins it. Switch the machine on and the cleaning fluid is applied evenly over the LP surface. Slightly warped records, however, need two or three goes for an even coating.

Five or six revolutions later, and the same three-position rocker switch is pressed to turn on the suction pump, quite a powerful affair and the item that is responsible for the vacuum-cleaner sound. Again, four or five revolutions are sufficient to ensure an impressively shiny, and slightly warm, black disc. Putting the LP back into the same old sleeve is definitely a case of new wine in old bottles; I used pristine Nagaoka ones.

Now back to the Turangalila. Among a busy hive of percussion there's the striking sound of the ondes martenot, a kind of drunken electronic wind machine. Before cleaning, this instrument had displayed a distinctly muddy sound which polished up nicely. The whole perspective of the recording on this particular LP, with its twenty-seven years of accumulated carbon monoxide, nicotine and heaven knows what else was also decidedly clearer.

A word of warning, however. No cleaning method will disguise groove wear. I installed a Koetsu Black for this test, simply because mine at its venerable age tends to render surface noise more noticeable, and while the sandpaper effect was reduced by a good fifty per cent it was, alas, still noticeable. Nonetheless, that was a very effective result for just two or three minutes' cleaning. Pity it doesn't clean up the dubious language of gangsta-rap while it's at it.

Compared with the manual one-side-cleaning Nitty Gritty, the Mini-Pro is well worth the extra cost. It takes a good deal - all, in fact - of the drudgery out of the business and the vacuum suction seemed to me to be more effective at sucking up the detritus in the grooves. The sliding plastic tray under the base of the machine which catches the used liquid included some surprising fragments which a going-over with a carbon-fibre brush had obviously failed to dislodge beforehand. There is a slight snag with this tray, however: it is shallow and fills up rather quickly. It should be emptied after a couple of cleans to avoid spillage.

Speaking of which, while Nitty Gritty provide a kind of miniature toilet brush for keeping the cleaning pads free of stray animal hairs, they should also provide a funnel to help the cleaning fluid negotiate its way from its bottle into the Nitty Gritty's tank; when the bottle is full it's a bit tricky. If you use a kitchen funnel, as I did, remember to rinse it afterwards; even though the mix of distilled water and isopropyl alcohol isn't toxic, it's only a tonic for records, not humans.

With typical Californian insouciance, the Nitty Gritty's instruction manual claims 'this record cleaner will make your records sound so good that you may injure yourself in the excitement of listening to them. Nitty Gritty will not be responsible for accidents caused by falling out of one's chair or wild leaping about.' Stiff upper lip, and all that... I didn't do myself an injury, or caper about with abandon after listening to the records I cleaned, but the underlying truth of the claim isn't one I'd feel like submitting to the Advertising Standards Authority for adjudication.

The cleaning fluid is applied before vacuuming dry, the headline shot shows the final result.
HITTING THE HIGHS

Eric Braithwaite finds Impulse H7s fine on vocals, but strong on the highs.

Listening through the H7s to Martin Newell’s ‘pome’ from The Greatest Living Englishman about the Orgasm Ray Gun - which, in case you don’t know, aids parliamentarians and others to aspire to happiness by artificial means - reminded me of a couple of things. One was that last time I heard a pair, some months ago, the Impulse H7s did quite a fine job on vocals, as they did with Newell’s ‘Liverpool Scene Revival’ pub-recorded poetry. The second was that if a week is a long time in politics, in loudspeaker manufacturing six months are an aeon.

After I originally heard the H7s I was somewhat mystified to hear one or two dealers say they were too bright for comfort. From the perspective of my own armchair, that was not something I would have gone overboard about. A bright, forward midband and upper-mid, yes. A noticeable - though not too intrusive step at the crossover point between the two drive units, yes. And less bass than a box this height might lead some to expect, also yes. However, the last should not be overstressed, because we’re not talking big horns here; we’re talking about a very slim-line floorstander.

Now, this pair had me mildly unnerved. Last time I was neither wearing rose-tinted spectacles (mine are tinted grey) nor high on indiscriminate enthusiasm. But there’s no doubt that
second time around the H7s were different and, sadly, the difference was more to their detriment than otherwise.

I had noted before that the H7s tended to suit relatively sparse acoustic arrangements and vocals. They were at their best with jazz quartets - the John Scofield Quartet’s splendid mix of horn, bass and drums sounding quite spectacular. This time, Bobbie Cryner’s eponymous CD came bubbling over on spectacular. This time, Bobbie Cryner’s eponymous CD came bubbling over on the H7s produced a creditable acoustic work had very sharply-defined cymbals, but with a distinct sting in the tail.

Equally clean-edged were the horns, saxophones sounding wonderfully fruity. This album has some extraordinarily broad mixes that hang free of the speakers, and pushed with power, the H7’s boxes were left behind and the music poured freely into the room in the way that only horns really ever manage with equanimity. Again, however, it was rather a mixed bag of fruit, since though the acoustic bass kept rhythm, its dynamics were uneven, producing a degree of syncopation in this complex design that wasn’t altogether intended by Bill Bruford.

Potentially - and in the light of experience - the impulse design clearly has the ability to produce thrills without frills. Put through a so-so production, like the rather compressed A Trick of Memory by ex-Jethro Tull’s Martin Barre, and the H7s delivered it unenhanced. This particular pair, however, hinted at the potential while not being able to quite fulfill it. Sample variation, perhaps, in the drive units? If the driver manufacturers had had a quick spell with an Orgasm Ray Gun, perhaps this conclusion - like some of the more powerful, more complex music played in the reviewing session, would have come to a more favourable climax.

The ethereal also gave way, rather surprisingly, to the numinous, since the spread of the choir proved difficult to place, as did the orchestral forces in Tchaikovsky’s Sixth.

The Impulse H7s are this month’s “we developed it using our ears” piece of hi-fi and, as is so often the case, they don’t measure too well. They have a very strong treble output, one that will definitely sound bright. And it’s detached from the rest of the response by a deep crossover suck-out, so expect to hear the metal dome tweeter as a separate entity to the midrange. Bass is very light as well, so they’ll need to be placed close to a wall.

Looking at the impedance curve things become a little clearer. Impulse recommend valve amplifiers for use with their ‘speakers, which are affected by strongly changing impedance. The hump in the impedance curve through the midrange will increase output, reducing the crossover dip. Likewise, the vertiginous dive in the impedance curve around 10kHz (down to a mere 2.5Ω) will reduce the treble output of most valve amplifiers, even those with high output and plenty of feedback, bringing the speaker’s response closer to flat.

A flat response with a flat impedance curve would achieve the same thing, put less stress on the amplifier, and allow the speaker to be used with any amplifier.

With a low output impedance solid state amplifier the H7s will sound bright, but with a valve amplifier the results may seem more balanced. DB.

MEASURED PERFORMANCE

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With a low output impedance solid state amplifier the H7s will sound bright, but with a valve amplifier the results may seem more balanced. DB.
Explosive bass dynamics, a midrange clear as a bell & shimmering treble........
........A tighter rendition of Music.......
In a world of black boxes,
valve amplifiers like this are scene stealers........
Hi-Fi World, June 1994

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...continued from page 47

that with age, our hearing ability drops from 20kHz to 15-16kHz. Having said all this, there must be, at least as a minority, punters who want to build neutral systems. If I am representative of this group's needs then I would ask of you, when recommending products, that you highlight those products that when used with other 'neutral' products that form the link in the chain, recreate the original performance as closely as possible. Or are there aspects I haven't considered?

New subject: valves. If a well designed valve amp is as good as, or better than, a well designed solid state amplifier, why are there no reviews of affordable valve power amps (Croft, Audio Innovations, etc)?

Regarding your World Favourites: why does Goldring dominate MM cartridges? Why is there such a limited choice of cartridges over £100? Why is the amp section so limited (CJ, Audio Research, Krell, Audio Note etc)? Similarly with speakers? Why are the ESL63s not mentioned?

A letter of mine was published in your December issue but I was disappointed that an MC cartridge was suggested for my MM amp! When I chastised EB in a subsequent fax, I suggested that you drag him to the dungeons for his sin. As I have not seen any signs of him of late, I assume you still have him locked up. Free him — all is forgiven!

Manolis Kroussaniotakis
Nicosia, Cyprus.

Ah yes, the concept of the neutral system. This is a great idea, but I've learnt from experience that that is all it can ever be. As a concept it is rooted back in the technologically go-getting Seventies and it is occasionally re-invoked nowadays, quite understandably since it seems eminently sensible.

Neutrality is, I can assure you, impossible to agree upon and is usually perceived as existing in the best items of the time, making it a relative value being constantly revised. This makes appending neutrality to an item a subjective judgement garbed as an absolute. It works up to a point amongst a peer group, often helped by a little coercion, but happily for us all, such groups - small and large - eventually break down.

Such a group, perhaps an influential one comprising engineers/reviewers or, in U.S. market speak 'opinion formers', may well conclude upon neutrality in a product, but that neutrality is illusory, existing only until a more neutral item comes along. I believe many people would describe quality loudspeakers with polypropylene cones as 'neutral', yet I also know of someone who insists such speakers invariably have a plastic 'quack' that he finds intolerable. Recently, we've been listening to hi-tech carbon-fibre cones and, you know, he was right!

In amplifiers the notion of neutrality can better be supported by apparently objective tests, eliminating fallible human judgement. But this only leads us straight into the arms of the largely discredited proposition that if it measures 'perfectly', it is perfect. Here we get into deeper waters, especially around a subjective test devised by Peter Walker that seems to confirm the proposition. It is one that few listeners agree with in practice, however, including us.

Finally, the other problem with reviving this notion is the speed with which it will be hijacked by every Jimmy in the business, misused and then fall into disrepute again. The Seventies were littered with 'neutral' loudspeakers, and similarly with Monitors and, worse, Reference Monitors. In retrospect, a lot of these things were technical abominations. And what about Musicality and Musical sounding items - remember that one? 'Neutrality' is a specious concept it seems to me, one that's already been done to death once. I doubt whether it will ever be revised seriously, but doubtless it will continue to be used loosely.

We have reviewed affordable valve amps, including Audio Innovations, but there aren't so many of them widely available. Massive power amps with four figure price tags are greeted with some scepticism in these regions, but Audionote appears in this issue, which I hope more positively addresses one of your requests. Goldring MMs dominate because there seems little better at the price these days and Quad ESL-63s have disappeared from World Favourites for reasons completely unknown to us. They'll be put back in. NK
WANTED

We wish to buy all kinds of secondhand Hi-Fi equipment from budget to exotic, old or new, working or not, odd items or complete systems.

TURNTABLES - Japanese, Linn, Rega, Thorens, Lenco, Garrard, Dual, Michell etc.
Belt Drive, Direct Drive, Idler Drive, plus Tonearms and Cartridges.

AMPLIFIERS - Small ones, Large ones, Good ones, Bad ones, Valve ones, Transistor ones.
Japanese, Armstrong, Rogers, Leek, Quad, Meridian, Pre-Amps, Power-Amps etc.

RECEIVERS - Japanese, Goodmans, Leak, Armstrong etc.

TUNERS - Analogue ones, Digital ones etc.

CASSETTE DECKS - Single, Twins, Old Top Loaders etc.

REEL - REEL - Revox, Aiwa, Philips, Ferrograph etc. Reels of Tape

CD PLAYERS - Geriatric ones, Modern ones, Multibit ones, Singlebit ones.

SPEAKERS - Big ones, Little ones, Famous ones, Forgotten ones, Brown ones, Black ones, inc. Diamonds, Goodmans, Maxims, Celestion, Dittons etc.
Bookshelf ones, Floorstanding ones, Drive Units, Crossovers.

JOB LOTS OF ACCESSORIES, DEALERS TRADE INS., CLEAR-OUTS, DISCONTINUED MODELS, EQUIPMENT RACKS, CABLES, PLUGS, RECORD, TAPE, CD COLLECTIONS, GOOD, BAD, OLD, UGLY, BULKY, TINY, WORKING OR NOT.

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B) Trichord Research "Pulsar" DAC outboard power supply improving even further the sound of this very popular unit.

C) The Triangle TE60 has impressed from the moment we heard it - near class 'A' sound, it does get hot - but sounds great on all our speakers. Now run in the Comete E Speakers are well worth a listen, especially for Acoustic/Jazz Fans. The TE60 is also an excellent pre-amp and is superb driving the TOCA 22 watt Pure Class A Power Amp into the Quad 63's

Ian C. Vauden
36 Druid Hill, Stock Bishop,
Bristol BS9 1EJ.
Tel. Bristol 686005

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PART I

The Leak TL12 'Point One' valve power amplifier was originally designed in 1945 and was revised in 1947. In revised form it remained in production well into the 1950s, in 1947 costing £25.15s. The 0.1 earned world acclaim as being the first amplifier able to achieve 0.1% distortion (hence the name), setting a performance standard for audio amplifiers of the time. Subsequently, 'Point One' became a trade mark of H.J. Leak and Co. Ltd.

The TL12, because of its designed-in reliability, accessibility (for replacement of parts), craftsmanship and finish was used not only for domestic music reproduction but also by professional audio engineers for broadcasting and recording and by telephone and telegraph companies.

The TL12 used Leak's triple loop feedback circuit, relying on a pair of triode connected KT66s to deliver 12 watts of power. The use of 26db of negative feedback was responsible for its low 0-1% distortion rating. It should not be confused with the later and simpler TL12+ that had an entirely different valve line up comprising smaller EL84 output valves, an ECC81 phase splitter, an EF86 input valve and a GZ34 rectifier.

Original TL12 amplifiers are now very rare, since they've long been acclaimed by the Italians and Japanese, leaving very few left in the UK. Their dimensions are approximately 32cm x 25cm x 21cm.
high and they weigh approximately 12 kilos each. They are quite a fair size for a valve amplifier, even by today’s standards.

goes overseas since Britons don’t really appreciate such things. The cost of running Leak TL12s would be slightly greater than that of a Leak Stereo 20, or a TL12+, due to the fact that it uses the KT66 beam tetrode valve. The original GEC KT66 which the amp was designed around is getting both scarce and expensive. The valve complement in the amp consists of an EF36 driver and ECC33 phase splitter, a pair of output KT66s and the GZ32 rectifier. Apart from the KT66s the other valves are relatively easily obtainable. As with all valve amps, the Leak’s do have associated running costs, primarily that of replacement valves. However, the Leak circuits were designed to run the valves so gently that they would last up to 10 years without replacement. This was achieved because the valves were never overdriven and always designed to run well within the valve manufacturer’s operating data. Although 12 watts doesn’t sound much power, when these amps were designed speakers were much more efficient, so anything more powerful was unnecessary. In the 70s and 80s, when speakers became less efficient, there was more

The attraction of the Leak TL12 has always been its great beauty of sound. It has the ability to reproduce music without adding any brightness or apparent unpleasant distortions to the sound. Voices, instruments, orchestras are reproduced with great naturalness, without any loss of dynamics. Because of the attention paid to detail in the circuit, components and construction of the amplifier, it can reproduce a sound stage very close to that of a live performance. Although rated at just 12 watts, sensitivity is high at 150 mV to produce full power. This is good compared to many power amps, both old and new, which need between 500 mV and 1 V.

Most Leak TL12s have now left our shores, so when they do become available they can fetch large sums of money considering their age. This is becoming increasingly the case for a lot of classic British equipment, but it
demand for greater power output, which meant that output valves had to be run much harder, reducing valve life. Typically 2-3000 hours before replacement was recommended. Because Leak paid particular attention to reliability, there was no need to use matched pairs of output tubes, as with all self-bias amplifiers, although it does help. Bias adjustment is unnecessary too.

If a classic amp is being considered, you should always budget for spare valves on top of the cost of the amp. Valves are consumables, much as tyres on cars.

When these amps were made, mono sound reproduction was the order of the day, but today you will probably want two for stereo. This is a drawback of the TL12, because during the course of its manufacture there were a number of variations and you need to find two identical units so that both channels sound the same.

Although the basic circuit stayed the same there were, for example, variations in the construction of the transformers. The early designs used an open frame design where one could see the core, as well as the wires going from core into chassis. Later types had side covers fitted to the transformers, filled with a bitumen compound. These transformers have smooth sides and look more modern. It goes further than this, as not all the transformers on one chassis were either open frame type or potted — a lot of TL12s had a combination of the two, which means getting two the same is very difficult.

The BBC used this amp fitted inside a monitor loudspeaker. This produced a variant fitted with an attenuator unit and a sensitivity control. They were manufactured to a higher standard than the ones for domestic use and had an output transformer which has a range of tappings better suited to present day loudspeakers.

The TL12 was designed in conjunction with an RC/PA/U control unit (preamp). There are a number of dealers who specialise in this type of equipment but scouring junk shops, book fairs, jumble sales could result in a lucky find. My pair took approximately one year for me to track down, so you may have to be patient.

Prices start at around £500 per pair for amps in working order but mint examples can cost considerably more. When purchasing amps such as this, if you are paying the above prices then they ought to be demonstrated as working. For single TL12s, expect to pay £100 — £200 depending on condition.

If you are buying without a demonstration, it may be worthwhile checking the output transformer with a multimeter. The other major thing to look for is oil leakage from the main capacitor block. If there is a leak then the capacitor will fail. For proper restoration, a new capacitor block will have to be made, which will be costly. A further point to remember is that the amp uses metallised paper capacitors which after years of use can become ‘leaky’, which with the grid coupler will cause the valves to over-run, resulting eventually in failure.

LEAK TL12
SPECIFICATION

Power 12 watts
Frequency response (1dB) 5-25kHz
Distortion (1kHz) 0.1%
(equal 2nd & 3rd harmonics)
Hum & noise -80dB
Sensitivity 150mV
Input Z 1MΩ/10pF
Output transformers
TL12/2/1 - 4/8/16Ω
TL12/2/1 - 2/4/8/16Ω
Mains input - 200-250V a.c., 120W
(100-125V U.S.)
Heaters - 6.3V / H.T. - 440V
Valves 2 x KT66, 1 x EF36 or 37, 1 x ECC33,
1 x GX32
Weight 12kgs
Dimensions 32 x 26 x 21 cm

OTHER MODELS - TL10, TL25, TL25A,
TL50.

PART - II

The cost of restoration and usage. What can and cannot be replaced. Circuit diagram and parts identification. Quality of parts. Final performance and how to get the best from the restored amp. Matching preamps and speakers.
RESTORE OR RENOVATE?
Is it best to restore a classic amplifier such as the Leak TL12 to its original state, or renovate it by improving on the original components and, perhaps, design? Haden Boardman discusses these much argued options.

HARMAN KARDON LS-0200
Following the success of the 0300 and 0500 loudspeakers from Harman Kardon, we take a look at the budget 0200s.

SPENDOR SP7
An elegant new two-way floorstander from loudspeaker specialist Spendor. Custom designed and built bass units accompany traditional engineering excellence.

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At last, our 300B kit amplifier is ready! We describe in detail the final design - and why it took so long!

TURNTABLES GROUP TEST
If you thought vinyl was dead, think again. We've found four superb turntables around the £400 price mark that offer sound quality in the first division.

LIVING VOICE LOUDSPEAKER SYSTEMS
Audio signals can be of infinite complexity. Their content is prone to corruption during any part of the processes of recording and reproduction.

Given that it is possible to store and recover this information with some degree of accuracy, (a debatable but necessary starting point) audio engineering's prime concerns are with the electronic amplification of that information and its conversion back to mechanical energy in the form of sound.

Both the amplification and the transducer used for the conversion will inevitably distort the signal. The art of good audio design lies in minimising the amount of distortion that occurs.

In each stage of amplification some distortion will be introduced, although most arises as a by-product of the output device's attempts to control an unco-operative loudspeaker. The ease with which the loudspeaker can be controlled varies depending on both frequency and level. It therefore makes good sense to employ the most load tolerant output devices possible in the amplifier, whilst keeping the number of gain stages to an absolute minimum.

Simple low powered amplifiers that fulfils these criteria have become more widely available over the past few years. Until now, the full benefits of this simplicity have not been readily apparent as most commercially available loudspeakers are too difficult to control accurately.

Loudspeaker drive units operate by passing a varying signal through a coil which is suspended in a magnetic field. The coil is usually coupled to a diaphragm and moves backwards and forwards following fluctuations in the input signal. As it is difficult to arrange a magnetic field that remains constant over a large area, the accuracy with which the coil and diaphragm follow the input signal deteriorates as the excursions become larger.

If a loudspeaker drive unit can be constructed whereby the coil and diaphragm assembly can move a great deal of air easily for a very small excurs ion then it will not be necessary to use as much power to generate the required amount of sound. A technique that achieves this more effectively than any other is Horn Loading and involves coupling the diaphragm to the air by using a flared horn. By arranging that the horn opens out at an optimally calculated rate, very effective coupling can be achieved with minimum distortion.

The loudspeaker can then be said to be an efficient transducer and will be easier for our idealised simple amplifier to control.

The AIR PARTNER & TONE SCOUT Loudspeaker systems use the principle of full range horn loading to optimise their efficiency. Both are 3-way designs with crossover points at 500 Hz and 10 kHz.

The astonishing efficiency of both the AIR PARTNER & TONE SCOUT allows them to reproduce all types of music with an appropriate sense of scale and ease. When used with suitable ancillary equipment they offer a level of resolution and realism that can truly be described as peerless.

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Reflections from Noel Keywood

kaleidoscope

Is hi-fi a dying subject? Recently, with the demise of Audiophile magazine and the publication of a new set of Audit Bureau of Circulation (ABC) figures showing UK hi-fi magazine circulations in steady and apparently irreversible decline, many Jeremiahs in the audio industry have told me they think it is. All the talk is of A/V (AudioVisual) systems, which are to be the new thing.

In wealthy Japan and America especially, there's a growing market for A/V, due to various influences, including rising affluence and reasonably easy access to a widening variety of information sources. Cable TV, Satellite TV, interactive cable networks, multi-way telephone links, CDI, video rental outlets and global computer communications links, such as E-Mail are all sources of information seeking to find their way into the home via A/V systems (the computer is included here as part of an integrated A/V system).

Big media groups like News International (The Sun, The Times, The Sunday Times, etc), Pearson (Financial Times) and communications giants like AT&T and British Telecom want to sell you their news, information and entertainment services, present advertising and charge for the transmission of this material into the home. What the full implications are likely to be and whether you and I will buy, buy, buy is another matter altogether. The demand for A/V potentially brings in big sales for a broad spectrum of electronics manufacturers, since a system needs a monitor screen, a TV tuner, a video recorder, possibly a video disc player, a special multi-channel amplifier with Dolby decoding and no fewer than five loudspeakers. That's a lot of kit. Deeply involved players are the major Consumer Electronics (CE) companies of course, like Sony, Hitachi, Panasonic and Philips, to name a few, as well as Dolby who seek to promote their compression and surround-sound system for home use. The A/V phenomenon offers them rich pickings: they're all piling in.

How does this affect the average hi-fi enthusiast? Within this potentially massive new market for C.E goods, transmission services and programme software, hi-fi takes a relatively minor role. Mr Globally Linked comes home in the evening and makes a choice from the huge range of media sources he has supposedly paid for, one of which will be CD, or perhaps MD/DCC. That's how industry today sees hi-fi, as a minor part of a major communications revolution. For them it heralds big, big sales, but forget hi-fi - we're talking A/V here. Hi-Fi as an independent subject is, in this scenario, a minor concern, the hi-fi enthusiast an outdated Neanderthal commonly cloaked in an anorak for easy identification and dismissal.

Declining sales of U.K. hi-fi magazines would appear to confirm this trend. In response, major publishers, you may well have noticed, are all starting A/V and Home Cinema magazines to cater for the new market and get a share of the huge advertising campaigns that are breaking.

Is hi-fi as a subject dead? No. It is hi-fi in an A/V context that is dying, since it forms just one small, almost inconsequential part of the larger overall scheme. At this level, hi-fi equipment has the same status as a television or a video recorder. People don't buy magazines to read about these things, except in the format of buying guides - that's one reason why circulations are in decline.

All the same, hi-fi won't die. Making music is performance and listening to it a deeply emotional experience that is interpretive; it is not literal. People will always want to listen to music, in live form or well reproduced in the home. What militates for a continuing interest in hi-fi is the cogent and unique way in which music influences us and, from this, a need to hear it beautifully reproduced. What I'm talking about here is a deep seated human need. Where there's such a powerful need, there'll also be a means of fulfilment.

Uncatered for by major manufacturers and magazines, enthusiasts are becoming increasingly determined and dedicated, but they also operate away from the mainstream, underground if you like. A sense of community is found by small interactive groups. Hi-Fi Societies constitute such a grouping and they communicate at their own level, rather than through magazines or the overground 'industry'. We are talking about hobbyists here.

It is a fact, shown by Britain's Office of Population Censuses and Surveys, that people have more leisure time and more to spend on it. They are switching off from being a couch potato and switching on to active leisure time pursuits where they are in control.

Not unsurprisingly, such pursuits are increasingly popular. They are DIY, sport, gardening, visiting country homes / museums and such like. Although DIY in this case means painting and sawing bits of wood, etc, it can equally embrace DIY hi-fi, which has the great benefit of being a wintertime activity (unlike most others) and vocationally useful too, especially if you are young.

Already in Britain I am starting to see hi-fi groups and societies growing stronger and more numerous, even while hi-fi in the A/V context declines. People are talking to each other about hi-fi, but it is taking place at a different, more specialist level than the overground publishers are wont to deal with. The advertising isn't there, neither are they.

Hi-fi as a subject will not die. We are not about to kiss goodbye to a means of furthering our enjoyment of music, a wonderful hobby and a shared experience. In effect, as the big companies lumber off to find new pastures, followed by the major publishers, it'll be reborn again in purer form, largely freed from commercial pressures and hype I hope.
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If you possess any aspirations towards electronic design, and indeed if you have tried some already, I'm sure you will appreciate just how much maths is required. A computer (especially a 486 or 386 with a maths co-processor which can handle floating-point maths very quickly) will launch your design capabilities beyond anything you could reasonably undertake on paper.

But what software should you look at? Well, there are many dedicated electronics computer-aided-design (CAD) packages that will assist in your designing activities in four main ways: circuit analysis, circuit diagram drawing (usually known as schematic capture programs), PCB layout and mathematics programs.

Circuit analysis programs range from the comprehensive, and cerebral, family of SPICE circuit modelling packages developed at the University of California at Berkeley, which allow for generation and analysis of circuits and signals in the time and the frequency domain as well as calculating accurate a.c. conditions, to relatively simple a.c. circuit analysis programs like ANALYSER III from Number One Systems. Mixed digital and analogue simulation can be performed by the powerful PSpice package from MicroSim Corporation. Cheaper software may be less visually impressive, but it can still be very useful.

For instance, I've used ANALYSER to 'prototype' a RIAA amplification stage. I would have had to invest in hundreds (or perhaps even thousands) of pounds' worth of test equipment to have measured the response of a real circuit as accurately, whereas ANALYSER III costs about £100 for an entry-level program. It also took me about 5 minutes to enter the circuit into the computer. Compare that with how long it would have taken me to build the circuit from scratch!

Schematic capture programs come in two families: those which are devoted to circuit drawing and which produce an output netlist (basically a text listing of all the components and connections) in various different formats required by PCB layout programs, and those which integrate schematic capture as part of the PCB design process. If you are really serious about electronics design you should look at the first type.

But they are much more expensive than the second type, and which produce netlists in industry-standard formats. If you are interested solely in circuit design for your own edification and delight, the integrated packages represent very good value for money. Examples of integrated packages are: ULTImate Technology, Board Capture, Maker and Router from Tsein, EasyPC from Number One Systems, Proteus from Labcenter Electronics (which integrates a circuit analysis program tool) and Ranger I from Seetrax. The two most widely used, industry-standard, dedicated schematic capture programs are FutureNet from Data I/O Corp. and Orcad. Both these programs are excellent, but probably a little expensive for the amateur.

Math packages offer powerful mathematical muscle to folks in many fields, not just electronics. The 'daddy' in this area (or should one say 'the mother of all Maths CAD packages') is Mathcad from Mathsoft. The newest version of this software is Mathhead 4.0, which takes full advantage of the 32-bit architecture of the 486 (and later 386s) and, like version 3, runs under Windows. With the benefit of the Windows interface, this program is visually enthralling, enabling you to plot 2D and 3D graphs; it will also perform algebra, calculus and matrix manipulations for you. But be warned, despite an exciting manual this program is no substitute for a mathematical education; it requires a solid understanding of the mathematical principles involved to get much out of it.

Of course, this isn't a comprehensive review of the available software. A quick glance at the available software, which is a burgeoning market area with bigger, newer and better packages appearing every week. I've concentrated on electronics, rather than mechanical CAD. If you are more interested, for instance, in designing and building your own speakers, you might want to look at one of the many mechanical CAD packages like Autosketch for Windows to generate drawings and cutting lists. Always remember to ring the manufacturer or local dealer and ask if a demo disc is available either for free or for a small charge. Many software developers supply a low-cost demo version (for example PSpice) which maintain full functionality, but limit data entry, which means, for instance, that only small circuits can be analysed or only small PCBs routed. These offer an excellent way to fully evaluate a program before investing in the full system.

Left by Richard Brice
STARt just a few years ago, TDL had until recently been a small loudspeaker manufacturer of the second division. The big three (Mission, Tannoy and Celestion) felt they had little to fear from a company whose cheapest speaker, the TDL Studio 0.5, retailed at £50.

How wrong they have been. When TDL announced the introduction of a speaker for under £100, Reflex Transmission Line (RTL) speakers from £160 and floor standing RTLs for just £250 (still half that of the 0.5 remember), surprise and a good deal of calculator button pushing swept through the industry. What’s more, the speakers turned out to be well finished (despite using vinyl wraps for the first time), had excellent specifications and sounded pretty decent too.

Two loudspeakers in the RTL range, the RTL 2 and 3, have already been reviewed in these pages - they were a resounding success. Here we set our sights a little lower and look at the price sensitive entry model, the TDL Near Field Monitor (NFM).

When they were priced at under £100, we all thought TDL must, quite simply, have gone mad. Now, at £119.95, they’re still a bargain when the speakers.

For the NFM, they’re still a bargain when the speakers.

with good bass for their size, especially
to impress their imaging). However, the bass couldn’t really be called solid; it was ‘euphonic’ (i.e. soft) and somewhat slow in places. Percussion, too, seemed strangely softened, although it was all there, with a sense of space and a marked lack of harshness. The general impression was one of overriding smoothness. It made the speaker very comfortable to listen to, but perhaps lacking in excitement.

Capercaillie’s ‘Soradh Bhuan an Barnaith’ is an upbeat folk piece. Here the bass again seemed artificially boosted, which had the effect of slowing down its pace. It could also ‘boom’ and produce a one-note bass lacking in texture. Whilst the treble remained restrained, on female vocals at least, there was a refreshing lack of sibilance and ‘tizz’. Vocals are clearly the TDL’s strong point, remaining faithful to the original recording. The flute was confidently portrayed with fine insight to every breath and overall, the result was that the music ‘jelled’ and had stage far too.

set to Radio 4, the NFM’s sounded superbly neutral and transparent. Speech was uncoloured and totally free from boxiness, placed in a soundstage far broader than one would expect for the size of cabinet.

With music, the TDLs were obviously more limited, but still they impressed me. From The Stranglers’ ‘Golden Brown’ they produced reasonably deep bass, even when placed one foot away from the wall (to improve their imaging).

Whatever, the bass couldn’t really be called solid; it was ‘euphonic’. Its 130mm doped paper cone is driven by a fair sized magnet for the price, and the unit is soldered to the connecting wires (almost unheard of at this price).

One part of the design which comes as no surprise, though, is the 10mm tweeter. From Audax, it is typical of the breed, appearing on some of the NFM’s competitors, such as speakers from JPW and Richard Allan.

The design is rear-ported, so it needs to be placed about 6” from a rear wall.

MIGHTY MINIATURE

TDL, better known for their floorstanding transmission line designs, have entered the fiercely competitive bookshelf loudspeaker market with their £120 Near Field Monitors.

Dominic Todd reckons they’ll find success.

Despite the NFM’s very real limitations, they still had my foot tapping - which means they must have got something right!

Changing the source from vinyl to CD showed a preference for the latter. Using Richard Thompson’s latest album and ‘Sweet talker’, the treble livened up considerably. However, the speakers did still give the impression of trying too hard to produce effective dynamic contrast, which resulted in the bass wallowing again. It’s the type of bass ‘waffle’ that small bass units in ported cabinets often suffer, but lightly stuffing the port with foam can often produce a partial cure.

The ‘speakers still had good grip on the music and never sounded strained with more effervescent tracks.

MEASURED PERFORMANCE

These are TDL’s first and, as far as I know, only non-transmission line ‘speakers. The question I wanted to ask was - how were they going to deliver the bass TDL lovers are accustomed to?

The simple answer is: they can’t. But although their bass certainly isn’t as deep or strong as that of their transmission line designs, the NFM’s still extend quite a good way down for their size. John Wright, TDL’s founder and designer, has the bass unit built in-house, so its parameters can be tuned for optimum results from a compact reflex enclosure.

The rest of the response tells a good tale too. Midrange is reasonably smooth and not recessed in any way that would be likely to impart box-bound colourations. Treble output is flat and level with that of the midrange, so I wouldn’t expect the speakers to sound either dull or overly bright. They should have a neutral balance with good bass for their size, especially when used in close proximity to a rear wall.

Another plus side to these miniatures is their higher than average sensitivity of 87.5dB, coupled with a flat impedance curve. The former makes them especially suitable for the budget amplifiers they are likely to be partnered with; the NFM’s will go loud with relatively few watts. The flat, high impedance curve (9.1Ω overall) will further ease the load on budget amplifiers,
Next I played Eric Clapton’s Unplugged, just out of nostalgia, remembering that when this album was played through TDL Studio Monitors they were superb with such a ‘live’ recording. I was interested to see if the NFMs would display a similar ability, even with a price disparity of some £1880 between the two! Sure enough, the small TDLs did excel here. Timing was accurate and the finely etched guitar wasn’t overblown, as can sometimes be the case. This is an album without a deep, processed bass, so the NFMs weren’t caught out and expressed themselves well, delivering an open, clean and punchy sound without hindrance from woolly bass.

The TDL Near Field Monitors possess fine build quality and a specification that could easily be justified on a speaker costing half as much again; they enhance TDL’s reputation as a speaker manufacturer. Whilst their sound quality is not perfect, against the competition at this price it’s good enough to be near the top of the pack. By far their greatest weakness is overblown bass (even when placed a foot away from the wall), but even this could be moderated by careful speaker cable choice and experimentation with port damping. In any case, it’s understandable that TDL have chosen such a balance in view of the fact that partnering budget amps and CD players are often bass light. Forgive them their bass problems, match carefully, and the NFMs will reward with an involving ‘big boned’ presentation that belies their size and price. Alongside Tannoy 603IIs, Goodmans Maxims and Richard Allan Minettes, TDL’s babies are well worth a listen. With these speakers, TDL are in the first division.

The NFMs are a well engineered and thought out design. They combine good bass with easy drive characteristics. A good budget transistor amp. of a modest 30 watts or so should be ideal. DB

**Frequency Response**

Smooth response will give a balanced sound

- **Impedance**
  - High overall impedance of 9.112
  - Terminal Impedance 8.82

**TDL NFM**

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**Price**

| TDL NFM | £120 |

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HI-FI WORLD     AUGUST 1994
COMPETITION - WIN ONE OF THREE SUPERB ROTEL AMPLIFIER/ TDL LOUDSPEAKER COMBINATIONS

This month we have some fabulous prizes on offer. Three of the finest core systems available for the money in fact, combining the strengths of British loudspeaker engineering from TDL together with Rotel amplifiers. Fastidious'ly tuned for highest quality sound.

1ST PRIZE
Rotel's RC980BX/RB980BX pre/power amplifier driving TDL RTL3 loudspeakers.

The first prize is a system with real power, able to deliver some of the deepest and most controlled bass around. TDL's RTL3s are a floorstanding reflex transmission line using twin 6.5inch custom made polypropylene bass units. They accurately resolve low frequency content without sounding overblown.

Providing a firm grip on the RTL3s is Rotel's RC980BX/RB980BX pre/power amplifier. The preamplifier offers a wide range of inputs, including two tape loops and MM/MC phono. The RB980BX power amplifier produces a powerful 120watts, which into the efficient RTL3s should be enough to fill even the grandest listening room.

2ND PRIZE
TDL's RTL2s were another group test success, coming top in our loudspeaker group test, December '93 issue. Particularly liked was their ability to open out a soundstage, producing a full scale performance. These are coupled with the superb Rotel RA-960BXII which produces 78watts of smooth, confident sound, our tests showed.

3RD PRIZE
This comprises a pair of TDL RTL1 reflex transmission line speakers and the Rotel RA-935BX amplifier so favourably received in our June '94 group test. Particularly liked was its neutral mid-band, detailed presentation and deep bass. The RTL1s are a small standmounter, but none the less are capable of superb results thanks to a custom designed bass unit.

To enter this fabulous competition for three super quality Rotel/TDL systems, simply complete the questions opposite.

Please send your entry on a POSTCARD or the back of a SEALED ENVELOPE, and completed in block capitals, to arrive no later than Friday 5th August 1994 to:

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Hi-Fi World Magazine,
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Don't forget to include your name, address and a telephone number so we can contact the winners promptly.

In the event of more than one entrant submitting all the correct answers, the winners will be picked by the Editor from the hat in the order 3, 2, 1. We will endeavour to publish the results in the October 1994 issue. Purchase of the magazine is not a precondition to entry. No correspondence about this competition will be entered into and the Editor's decision is final.

No employees of Audio Publishing Ltd. or any of the companies associated with production or distribution of the prizes may enter.

COMPETITION ENTRY QUESTIONS

1) When was the Rotel RA-935BX reviewed in Hi-Fi World?
   A. April '92    B. May '93    C. June '94    D. July '95

2) TDL are best known for transmission line speakers, but what does RTL stand for?
   A. Round Transmission Line
   B. Reflex Transmission Line
   C. Reflex Transport Line
   D. Reflex Transmission Load

3) How powerful is the Rotel RA-960BXII amplifier?
   A. 40watts
   B. 78watts
   C. 120watts
   D. 150watts

4) How many, and what size are the bass units in the RTL3?
   A. One 6.5inch
   B. One 8inch
   C. Two 6.5inch
   D. Two 8inch

THE TIE BREAKER (OBLIGATORY)

Ortofon are looking for a SLOGAN to characterise their commitment to vinyl. In no more than ten words, suggest something appropriate.

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goes to: Mr. M. Ward of Hull

2nd-5th prizes of KEF Reference
107/1 loudspeakers go to:
2. Mr. D. Larkin of London
3. Mr. A.P. Chapple of Gwynhyn
4. Mr. M. Passey of Newport
5. Mr. M. Westminster of

Congratulations to all the
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Recently I finally found time to visit specialist drive unit manufacturer Audax, down in Chateau-Du-Loir, near Le Mans in France (approx. 100 miles South of Normandy). The weather was fantastic and the food, as ever, fabulous. But the real reason for the trip was to find out what new drive unit materials are being developed for the future.

This visit, to a modern, hi-tech drive unit manufacturer who uses no less than twelve different cone materials in the standard catalogue range, is something many UK manufacturers would benefit from. It gives a cogent insight of what is possible with today’s materials and technologies, as well as what lies ahead.

Regular readers will be familiar with HDA (High Definition Aerogel) as a cone material, a development we’ve been following over the last few months. HDA is made from an acrylic polymer gel in which a carefully controlled amount of carbon and Kevlar fibres are embedded. This is then heated in an oven to form an extremely rigid composite. It is ultra light and super strong, imparting high sensitivity and fast response to transients. It gives a detailed and crisp sound unmatched by most other materials. HDA has been used by Audax in a range of drive units for very high quality hi-fi systems.

However, in the professional recording/PA industry, high sensitivity and power handling are not new. Sensitivities of above 100dB are considered average. Many of the properties of HDA looked attractive, but it wasn’t strong enough to survive extended high powers – so along came HD-I. This is made in a very similar way to HDA, but the carbon and Kevlar fibres are longer, giving greater strength.

At the moment Audax have just one model, a 15inch HD-I unit, available, but they are still developing the material and learning about its properties; prototype units for 6.5, 8 and 10inch HD-I units are already under way. This is just one of the new materials under development.

It’s not just new materials they are investigating, but new technology as well. See this month’s News section about their new, oval gold dome tweeter which is exciting people in the industry at present.

So, what is the advantage of these recent advances in drive unit technology? To start with, higher sensitivity and a higher overall impedance means less work for your amplifier. Most amplifiers tend to distort more as power increases, so for the same loudness a sensitive speaker will cause less distortion than an insensitive one.

You may think this is only important for valve amplifiers, but it is possibly more important for transistor amps. Valve amplifiers, in general, tend to produce even-order harmonic distortion, which our ears find acceptable in small doses. Transistor amps on the other hand, commonly produce odd order distortion, which, even in small amounts, can result in a sharp or gritty sounding midband and treble. So it is important to keep distortion as low as possible if you want a smooth sound from your transistors.

If one loudspeaker produces 84dB of sound from a watt and another 90dB, the latter is turning more of the signal it is supplied into music. Insensitive speakers tend to lose fine detail, making them sound sound heavier, slower and often muggy in comparison to the highly detailed and energetic sound a sensitive speaker can produce.

Low level detail provides much of the subtle ambience and atmosphere that makes a recording seem natural and lifelike. This low level detail is of minute signal level. Imagine such a minuscule signal trying to push and control a heavy, inefficient cone. Much of it will be absorbed by an insensitive loudspeaker, little being heard by the listener.

A sensitive loudspeaker on the other hand, using a modern, super-light cone and highly efficient motor/magnet, will better turn his low level signal into sound. For a long time it has been appreciated that light-cone, high sensitivity loudspeakers give a brighter, more detailed and faster sound.

Light cones respond more quickly and linearly to transients. As a result, you rarely find ponderous bass with a sensitive loudspeaker.

A light and fast cone shares sonic properties with electrostatic loudspeakers; the concept of a light and highly responsive diaphragm is very similar. Because of this, and the stiff high-technology materials used, high efficiency dynamic drive units possess more of the transparency and openness of electrostatics.

At last, larger manufacturers are beginning to consider such things. The benefits of highly efficient drivers have long been known about, even if the real reason for the trip was to find out what new drive unit materials are being developed for the future.
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Browsing through this magazine you'll notice mountains of text on how equipment sounds and rivers of ink on how it measures. And why not? This is a hi-fi magazine after all. Yet many people don't actually buy their hi-fi for what it sounds like, but for what it looks like. It seems only right then to explore just what is stylish hi-fi and what is not. After all, once such style gurus have purchased their hi-fi they might actually enjoy listening to it, making style a lure for the hidden wonders of good sound quality. And, in any case, why shouldn't hi-fi look as good as it sounds?

Hi-fi equipment tends to fall into four distinct categories: boring black boxes; traditional hi-fi; slightly more stylish blackish boxes; wild and wacky.

The first of these includes most of the mass market hi-fi separates on sale today. Mainly Japanese in origin, they are easily spotted, flaunting off-garish golden script, big golden (effect) feet, and enough flashing lights to rival Piccadilly Circus. It's hardly surprising that hi-fi doesn't aesthetically appeal to most folk when styled like this. Unless, that is, you drive an XR3i with a fluorescent Oakley sticker and blacked out rear lights! However, whilst the Japanese set the far extremities of the market hi-fi and what is not. After all, once such style gurus have purchased their hi-fi they might actually enjoy listening to it, making style a lure for the hidden wonders of good sound quality. And, in any case, why shouldn't hi-fi look as good as it sounds?

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Pay a visit to the Design Museum, by Tower Bridge, and you'll find that it's the third category (slightly more stylish blackish boxes) that are held up as bastions of fine hi-fi design. A selection of Quad equipment through the ages and a display of Naim equipment are on display. But are modern Quad and Naim amplifiers truly stylish? Or are they just clean looking boxes? Is a Quad 405 more stylish than the sculpted fascia of a Quad 33? These products may look reasonably slick and sophisticated, at least to European eyes, but whether they are truly stylish is open to question. To followers of brutalism and Le Corbusier, perhaps; to others, perhaps not. They may be preferable to your average Technics or Sony, who simply plaster legends on panels, but are they really imaginative or innovative?

But wait, what about sound quality I hear you cry? Isn't this so much more important as to make style in hi-fi immaterial? Whatever the sonic merits of such modern equipment may be, it rarely comes into the equation with such purchases. This is a shame, because many don't know what they're missing in terms of sound quality and style when you take a look at just what is available on the market.

The last 'wild and wacky' category, describes often awe inspiring hi-fi equipment which is totally individual and needn't always cost an arm and a leg. It's this equipment which I hold up as being at the true cutting edge of hi-fi design, and that represents the best available today. Take, for example, the Michell range of turntables. Not everyone will warm to the swathes of acrylic used, but it can't be disputed that they're a real conversation piece. In my opinion, Michell products don't need to be hidden away in a cabinet; they stand out as good designs in their own right.

It's not just thought provoking design that marks the Michells out, either. They offer good value for money, with prices from £325 and pretty damn good sound too (see the Mycro in World Favourites), all of which just goes to show that hi-fi can occasionally be all things to all men.

Michell isn't alone in offering hi-fi that offers not just fine sound quality, but also is the ones whose styling attracts attention. And not just by stopping passers by in their tracks, attracted by the glinting in shop windows, but even through star appearances in big budget American films, believe it or not. Did anyone spot what looked like a VPI fitted with an equally gorgeous parallel tracking arm (an Air tangent?) in the block buster, Indecent Proposal?

Admittedly, it was only a glimpse, and turntable sales are unlikely to receive the level of boost Lotus cars enjoyed through their appearance in the film Basic Instinct, but I couldn't help taking amg satisfaction from the fact that a high end turntable had been chosen rather than a bland Oriental CD player to represent the very best money could buy.

More importantly, it was portrayed as something to aspire to, and this is what's needed. To create new interest in hi-fi products they must be seen in the film and print media as something interesting and aspirational, and to achieve this we need fewer black boxes - with or without gold feet! Now, where did I leave the keys to my XR3i?!
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That title just about says it all really. Sonic Youth have been the undisputed kings of New York’s minimalist Art-rock scene for some ten years now, reveling in screeching guitars, pared down rhythms and vocals which are so dry and laconic they make Lou Reed sound like Frank Sinatra. As such they’re pretty much of an acquired taste, and to be frank their particular brand of stripped-down mayhem is prone to take them down the same mean streets more often than once. But then that’s surely part of the plan, as well as much of their charm.

Also there are many who, despite treading similarly rowdy paths – Jesus & Mary Chain or My Bloody Valentine, say – are more accessible by dint of a greater propensity for melody. Indeed for my money it’s still 1989’s Daydream Nation that’s their most regularly replayable work.

It was quite possibly the crossover success of the last mentioned double-album which led to Sonic Youth finally landing a major deal with Geffen. Yet this, even more than the preceding ‘Dirty’, smells of nothing remotely resembling compromise. That said, it’s – for Sonic Youth anyway – a rather restrained affair. The acoustic opener ‘Winner’s Blues’ could almost be an early Rolling Stones’ demo, and there are far more lead vocal duties left to Kim Gordon than usual, she whose mainly breathy, not to say winsomely girlish tonsils are hardly the stuff of which threats are made. Still, items like the apocalyptic ‘Waste’ are there to please Youth die-hards. Not their best work perhaps, but fans shouldn’t be too disappointed, and it’s nice to find – as on the odd percussions of ‘Tokyo Eye’ – the band still actively seeking out new sounds from their paradoxically narrow palette.
And sometimes you just ask yourself – can a band really come up with a record this good? From the exhilaratingly chirpy opening ‘Girls & Boys’ right through to its closing groove, a wacky little throwaway jokelet kiss-off called ‘Lot 105’, Blur’s Parklife is pure, unadulterated joy throughout. It’s catchy to the nth degree, dry, witty, almost ceaselessly inventive, quintessentially British, funny and wry by turns...it’s just...so...damn...good.

I thought Pulp’s His ‘n’ Hers was something rather special, but this has pushed even that minor masterpiece out of my listening space almost to the exclusion of everything else since I first played it. It just sparkles so constantly – the sort of record that launches a million superlatives. Last year’s Modern Life Is Rubbish was hot stuff by anybody’s standards, but this takes Blur’s unique blend of various elements of great British pop styles – a good three decades’ worth – and hits dizzying new heights of dazzlement.

At the heart of Blur are the voice and songs of Damon Albarn, here proving conclusively that he can stand with any of the great Britpop masters – Ray Davies, Pete Townsend, Paul Weller – make your own list, the picture comes over loud and clear that this is one special talent. Rounding out the quartet are bassist Alex James, Graham Coxon on guitar and drummer Dave Rowntree. Together they make a bright, notously rousing sound, a selection of songs that take in everything from the thunderous punk of ‘Jubilee’, the exuberantly cynical ‘Magic America’, to the pensively touching ‘This Is A Low’ – which must be the first song ever written about weather forecasts and yet manages, at the same time, to be a moving celebration of the British coastline.

As if it were needed, Blur’s Anglo propensities are rammed home by a guest appearance from actor Phil Daniels, who does a splendid bit of geezer speak on the title cut – which is (but of course!) a paen to the joys of feeding the birds in the park.

Like The Jam before them, Blur enjoy not only the three-button jackets of the mod era, but an equal fascination for and ease with three-minute vignettes. Which is to say Albarn’s lyrics tell stories, little stories full of extremely vivid characters – like the sexually troubled ‘Tracy Jacks’, a cousin to Syd Barrett’s ‘Arnold Layne’, the couch potato ‘Jubilee’, a spotty teenager who spends his life playing computer games and watching the box when he should perhaps – like the sexually voracious characters of ‘Girls & Boys’ (a sardonic knock at the dumb promiscuity of the Club 18-30 crowd) – be out chasing the ladies.

There’s more than a hint of the aforementioned Mr Barrett too in Alex James’ ‘Far Out’, a gently ethereal list of planets that’s a mild little trip-out in homage to Syd’s ‘Astronomie Domine’, while the broody paranoia of ‘Trouble In The Message Centre’ recalls Wire circa ‘Am The Fly’ and ‘Outdoor Miner’. And so it goes.

And if most of the titles all but speak for themselves – ‘Bank Holiday’, ‘The Debt Collector’, the moody noir romance of ‘To The End’ – the smart lyrics are only the icing on the cake that’s made of gloriously spun guitars of all shades, sturdy rhythms, wildly boisterous choruses galore, the whole interlaced with crazy little snippets of fairground organs, twiddly bits of uncertain origin – in short all manner of neat little touches that only add to the pleasures ofsolidly made songs that have more hooks than a champion angler.

This is a great record and if you do not buy it immediately then you must either be recently deceased or very silly indeed or both. Either way you’ll be missing some of the year’s most magic moments.
VIOLENT FEMMES
New Times
ELEKTRA 7559-61553-2

• Long player number seven from the mildly eccentric Milwaukee trio formed around the writing and singing talents of principal Gordon Gano. Aided and abetted by bassist Brian Ritchie and with the addition of a new drummer in Guy Hoffman (ex-Bo-Deans, Oil Toasters), the Femmes celebrate their thirteenth year in the studios with a fairly typical example of their specialities. Gano’s always reminded me of the young Jonathan Richman/Lou Reed in that he has a similarly wacky sense of humour as the former and vocal tone not dissimilar to the younger Reed’s. At least he did on the earlier VF material, but passing time has made him very much his own man and it’s nice to see such a dedicated left-field performer still hanging in there after all these years.

This may not be the greatest recording of all time but it has its moments. Gano and Ritchie’s lucid, potent self-production belies the smallness of the line-up, witness the awesome power of ‘Breaking Up’. The playing too is off-kilter impeccable – the opening ‘Don’t Start Me On The Liquor’ has wonderfully sinuous bass work, whilst the drums – particularly here and on the following ‘New Times’ – are simply majestic. There’s a timely cap to the late Frank Zappa on the latter, and a tip of the cap (tain) Beefheart in the weird answering vocal refrain of ‘Machine’ – about a bloke who takes over the world ("it was either that or learn French", Gano informs us, later admitting that he learnt the Gallic tongue the next weekend). This is fairly typical, as are such unexpected pastiches as the Latin/Yiddish collision ‘Mirror, Mirror’, which would make a great single for Topol - or a terrific Bar-Mitzvah party closer if it weren’t for the closing lapse into wilful oddity. Good thing to hear these playful loonies again, and long may they drool, OK?

DR. JOHN
Television
MCA/GRP GRM 40252

• Dr John aka Mac Rebennack must have been in the biz at least thirty years by now, a living embodiment of all that’s great about the totally unmistakable sound of New Orleans piano music. And sure, he’s had his ups and downs (not to mention a goodly heap of alcohol and narcotics, by all accounts) but when he puts his ten long fingers on them 88 keys, there’s nobody to touch him. After some time in the doldrums he re-appeared a couple of years past with a brilliant tribute album of covers of the songs that inspired him – thus keeping alive the memory of the likes of Professor Longhair and countless other Crescent City luminaries.

This time out it’s Mac’s own compositions which dominate proceedings, aside from Sly Stone’s ‘Thank You (Falleten Me Be Mice Elf Again)’ and Berry Gordy’s ‘Money’, both of which – needless to say – are given potent transfusions of Dr. John’s all-powerful grrr-grrr voodoo magic. The lyrics, delivered in that inimitable five-dollar-cardboard-suitcase-voice are wild and witty, the backing players and singers are among the best in the land (Hugh McCracken, guitars David ‘Fathead’ Newman, tenor sax, et al). But what really shines of course is Dr. John’s piano playing – a rockin’, rollin’, sexy, sassy, chuckly, quintessentially horny thing which is, quite simply, without living peers. Yassuh and God bless, Doc. This is one prescription this patient will have no trouble adhering to. Not at all.

WALTER TROUT BAND
Tellin’ Stories
SILVERSTONE ORE CD530

• The Walter Trout Band are one of them hard rockin’, raw-throated, sweaty-denimed (I’m guessing about the denim) rock ‘n’ rollers only America can really produce. Ironically, it was while touring Scandinavia as part of John Mayall’s Bluesbreakers that guitarist Trout (depping for a sick Mayall) realised he had it in him as a front man. He’s never looked back.

This, his first British release (but, something like his half dozenth (!) long-player) displays Trout’s hot ‘n’ sweaty, five-pints of lager blues/rock with the accent somewhere in between the blues and the rock. It’s rousing stuff and comes highly recommended for anyone with memories long enough – or record collections wide enough – to encompass the likes of Lynyrd Skynyrd, The Allman Brothers, and George Thorogood and the Destroyers. Go wild.
LUSH
Split
4AD CAD 4011 CD

It’s getting on for two and a half years since Lush last regaled us with their aptly-named distillation of fire and honey. Those oh, so delicate volcIngs (I was going to say ‘ethereal’, that word, but...) are the work of Miki Berenyi, aided and abetted by backing singer/guitarist Emma Anderson, while the hardbody rhythms are the responsibility of bassist Phil King and Clint Au’Land on drums.

There’s plenty here to please addicted Lush-ites, but there are one or two pleasantly different changes of pace also – take the anything but ethereal ‘Blackout’ while ‘Light From A Dark Star’ lives up gloriously to such a fab title, while the closing ‘When I Die’ will melt the hardest, thomiest of hearts. Hopefully the only prophecy contained in the title is intended ironically, because on this showing Lush have plenty of big adventures still ahead of them.

EMMYLOU HARRIS
Cowgirl’s Prayer
GRAPEVINE GRAD 101

Ms. Harris made her name by providing the angelic, silver-pure antidote to the late, great Gram Parsons’ melancholy country sobbing on the classic GP and Gram & The Angles discs. She’s since gone on to claim her own name proudly in the Country Rock Hall of Fame with classic albums such as Luxury Liner and much excellent live work.

While keeping her own fairly modest writing contributions in the title, the band aren’t better known over here. Hurts so good.

KMFDM
Angst
INDUSTRIAL CD RR 998872

“German pioneers of industrial electronic music,” it says on the Press Release. This is album numero six for the Deutsche crunchers, and with the likes of Trent ‘Nine Inch Nails’ Reznor and Die Warzau lending various throat-crushing, earhole-bashing hands, it’s a wonder the band aren’t better known over here. Hurts so good.

HURTS SO GOOD

SPIZZENERGI
Unhinged
DAMAGED GOODS DAMGOOD 34

The irrepressible Spizz, under a variety of Spizzy names, was one of the less high-profile heroes of immediate post-punk. Nevertheless with the likes of ‘Soldier Soldier’, ‘Where’s Captain Kirk’, ‘Mega Ctr 3’ and numerous others, he made scores of glorious sides.

The best (plus lots of lost and forgotten living-room gems) are on this mightily amusing, interest-filled collection. One for serious conno-sewers of a grimrurging hit-to-be-forgotten era.

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Here's a superb, Class A, 20watt stereo power amplifier that uses the inexpensive Russian 5881 output valve, a military version of the regarded American 6L6, designed for low distortion audio work. It has super-quality output transformers (4/8/16Ω selected internally) to minimise distortion and the input stage uses triode working. A rugged, sixteen-gauge, all-welded steel chassis is provided, together with protective bottom plate for safety.

**SPECIFICATION**

<table>
<thead>
<tr>
<th>Power</th>
<th>20 watts/ch.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency response</td>
<td>16 Hz-40 kHz</td>
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<tr>
<td>Distortion</td>
<td>0.02%</td>
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<tr>
<td>Separation</td>
<td>60 dB</td>
</tr>
<tr>
<td>Noise (CCIR)</td>
<td>-103 dB</td>
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<tr>
<td>Sensitivity</td>
<td>240 mV</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>400 x 300 x 180</td>
</tr>
<tr>
<td>Supply</td>
<td>110/120V or 220/240V</td>
</tr>
<tr>
<td>Weight</td>
<td>16 kg (34 lbs)</td>
</tr>
</tbody>
</table>

The High Definition loudspeaker is ideal for low power, high quality amplifiers, transistor or valve. It goes very loud with just 1.5 watts, having an enormous sensitivity of 94 dB - that's 8 dB more than most other speakers. It is also a very easy load for valve amps (8 ohms) and it gives a terrifically dynamic and fast sound. This speaker is also unusually suited to low powered vintage amplifiers, such as Quad IIs, Radfords, Pye Mozarts and such like.

The High Definition loudspeaker is available in two forms; as a drive unit pack containing two bass units and two tweeters modified and tested, or complete with all crossover components, gold plated bi-wire terminal dishes, silver plated copper wire and long haired wool.

**KLS2 LOUDSPEAKER**

Drive Unit & Crossover kit etc

£195

Drive Unit Pack

£145

See page 83 for order form...
This is a specialised amplifier based on the highly linear 300B triode valve. Our 300B runs in Class A, giving one of the most sweet, open and neutral sounds possible today. Matched with good loudspeakers, it is unsurpassed.

The kit comprises a strong 16-gauge mild steel chassis, fully punched, welded and ground smooth. Finish is a durable 'powder coat' black. A protective bottom plate is provided for safety. Output terminals (one pair) take 4mm plugs axially and radially for bi-wiring, or heavy gauge bare cable. Output options of 4/8/16Ω are selected internally at the transformer. A small circuit board carries most of the components. 240/220V and 110/120V versions available. Can be monoblocked for 60watts.

All parts are included in the kit, except valves since different 300B makes are available.

A fully built version from an approved build service is also available.

SPECIFICATION

- **Power**: 4watts
- **Frequency response**: 5-18kHz/50kHz
- **Distortion**: 0.2%
- **Separation**: 54dB
- **Noise (hiss/hum)**: -100dB/72dB
- **Sensitivity**: 240mV
- **Dimensions (mm)**: 455w,295d,175h
- **Supply**: 110/120V or 220/240V, 220V
- **Weight**: 20kgs (44lbs)

The 4W Single-Ended amplifier kit is a line level integrated amplifier. It comes with three line level inputs and a tape output. High quality components are used throughout, including polypropylene signal capacitors, Alps volume control, custom C&K gold plated selector switch etc. Valves are included.

**SPECIFICATION**

- **Power**: 28watts
- **Frequency response**: 5-18kHz/50kHz
- **Distortion**: 0.2%
- **Separation**: 54dB
- **Noise (hiss/hum)**: -100dB/-72dB
- **Sensitivity**: 240mV
- **Dimensions (mm)**: 405w,295d,175h
- **Supply**: 110/120V or 220/240V, 220V
- **Weight**: 20kgs (44lbs)

4W SINGLE-END TRANSFORMERS £190

A set of transformers (8kgs) for our single-ended amplifier (December '93. Supplement No 6).

1) Mains (1 off) Secondary: 0-210V a.c. at 150mA, 6.3V centre tapped. Primary: 220/240V or 110/120V - please state which on order form. Drop through fixing.
2) Output (2 off) High quality transformers with grain orientated silicon steel laminations. Secondary tapped 4/8/16Ω. Drop through fixing.
3) Choke (1 off) Compact 1.2H/150mA choke for under-chassis fixing. Frame mount.

6080 valves - double-triode power valve for the single-ended amplifier - £15.00

KS881 (20W CLASS A) TRANSFORMERS £220

There are four transformers in all, weighing 12kgs.

1) Mains (1 off) Secondary: 0-360, 1 x 6.3V centre tapped. Primary 220/240 or 110/120 - please state which on order form. Drop through fixing.
2) Output (2 off) These transformers use high quality materials, laminations of thin and best quality grain orientated silicon steel. Output tapped 4Ω, 8Ω and 16Ω. Drop through fixing.
3) Choke For smoothing of the H.T. line to provide best sound quality, a 5H choke that fixes under the chassis. Frame mounting.

300B (28W CLASS A) TRANSFORMERS £430

Seven transformers in all, weighing 16kgs (35lbs).

1) Mains (1 off) Secondary: 230V-0-230V, 5 x 5V, 1 x 63V. Primary 220/240 or 110/120 - please state which on order form. Drop through fixing.
2) Output (2 off) Designed for low distortion and broad load compatibility from the 300B. Cores with centre-hole fixing to avoid corner flux concentration; laminations of grain orientated silicon steel. Output tapped 4/8/16Ω. Drop through fixing.
3) Intervale/phase splitter (2 off) Frame mounting.
4) Chokes (2 off) For smoothing of the H.T. lines, two 3H chokes that fix under the chassis. Frame mounting.
**WARNING**

THESE ARE EXPERT KITS, NOT FOR THE INEXPERIENCED. YOU MUST BE ABLE TO SOLDER AND READ A CIRCUIT DIAGRAM. THE VALVE KITS CONTAIN LETHAL VOLTAGES. WE CANNOT BE HELD RESPONSIBLE FOR ANY ERRORS ARISING FROM THE CONSTRUCTION OF THE KITS.

**ORDER FORM**

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240/120 option - delete the voltage NOT required.

Valves included except where stated.

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<table>
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<th>ORDER No.</th>
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HI FI WORLD  AUGUST 1994 83
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Reference guide to Briton's Manufacturers and Distributors

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This month, the ladies take centre stage: the cellist, Sophie Rolland; the violinist, Maria Lindal and, one of the rising stars of the operatic world, the American soprano Sylvia McNair. You could also argue that Elgar's First Symphony - our record of the month - might never have seen the light of day were it not for the encouragement Elgar received from his beloved wife. Heartbroken after her death in 1920, he said quite simply, “All I have done was owing to her. . .”

HEINRICH IGNAZ FRANZ BIBER
Partia III/Partia V/Sonata VI/Sonata X/Sonata Representativa/Passacaglia XVI
Maria Lindal, violin; Ensemble Saga BIS CD-608 (DDD/59.36)

There are sounds here, I would venture, which will surprise and even startle most listeners. The latest offering from one of the lions of the avant-garde? Not quite: this music is around three hundred years old. What gives it its distinctive flavour is a technique called ‘scordatura’, the musical equivalent of cayenne pepper and tabasco sauce! As you might surmise, this is an Italian term, literally translating as ‘out of tuning’. Quite simply, a stringed instrument is tuned abnormally in order to produce an unusual note or other effect. It was most prevalent during the Baroque era and, in skilled hands - those of Vivaldi, for example - could produce striking results. Another who exploited its potential was Heinrich Ignaz Franz Biber. Born in Wartenberg in Bohemia on August 12, 1644, his career followed the then-familiar pattern of court musician, culminating with a rise through the ranks in the service of the Archbishop of Salzburg. He was ennobled by his patron in 1690 and died in 1704. Biber is known to have been one of the finest violinists of his age so it is no surprise that the instrument figures strongly in his compositions, or that he should revel in what this, then relatively new, instrument was capable of. Biber couldn’t have wanted for better.

GEORGE FRIDERIC HANDEL
Silete venti HWV242/Laudate pueri Dominum HWV237
WOLFGANG AMADEUS MOZART
Exsultate jubilate K165
Sylvia McNair, soprano; Monteverdi Choir; English Baroque Soloists; conductor, John Eliot Gardiner
PHILOS DIGITAL CLASSICS 434 920-2 (DDD/59.13)

The rise to international prominence of the American soprano Sylvia McNair has been rapid since her memorable European debut as Ilia in Mozart’s Idomeneo in the late Eighties. Her repertoire, too, is now remarkably diverse, from Handel through Gluck, Mozart, Beethoven, Mahler and Britten to . . .

Sylvia McNair, ESI INE JUBILATE RII '11I...1011RT
GEORGE FRIDERIC HANDEL
Silete venti HWV242/Laudate pueri Dominum HWV237
WOLFGANG AMADEUS MOZART
Exsultate jubilate K165
Sylvia McNair, soprano; Monteverdi Choir; English Baroque Soloists; conductor, John Eliot Gardiner
PHILOS DIGITAL CLASSICS 434 920-2 (DDD/59.13)
The words of Edward Elgar, at a lecture at Birmingham University in December 1905, the outlook for the purely abstract symphony did look bleak. Had it reached its apotheosis in Brahms and Bruckner? True, Mahler was composing symphonies, but they were far removed from the traditional form of the genre. In England, there was no symphonic tradition to speak of. But Elgar’s observation to his students was prophetic. Did he have some inkling that the “looked-for genius” of which he spoke might indeed be himself?

He had first attempted a symphony in 1898-99, a programmatic work taking the life of General Gordon (“Gordon of Khartoum”) as its subject. We do not know what stage this work reached, but certainly some of the sketches for it were incorporated into the Second Symphony. It was not until the summer of 1907, on June 27 to be exact, that Elgar’s wife recalled hearing him playing ‘a great, beautiful tune’ on the piano. It was to become the motto-theme of the First Symphony, the organic core of the entire work.

Elgar continued to work on the symphony during a stay in Rome between December 1907 and May 1908 and his commitment to it intensified upon his return to England. He worked feverishly that summer and completed the work on September 25, dedicating it to the conductor Hans Richter, who had given the first performance of Elgar’s first major international success, the Enigma Variations, in 1899.

The First Symphony received its premiere on December 3, 1908, at a Halle concert in Manchester. The audience’s reaction was ecstatic, as it was in previous months when Richter gave the first London performance. In the ensuing twelve months the work was played a hundred times, not just in England but in Vienna, Berlin, Russia, Australia and the United States. Elgar’s prediction had been fulfilled: the symphony had been revived. Moreover, not only was it far-and-away the finest symphony up to that point written by an English composer, but its glorious elegiac, slow movement prompted comparisons with no less than Beethoven. Elgar’s A flat symphony set English music on a path which led to the great symphonies of Walton, Vaughan Williams, Bax, Rubbra, Alwyn and, most recently, Robert Simpson. On that basis alone, it would merit its place in musical history.

But this is also a score that combines the utmost musical accomplishment with a psychological complexity and deep emotional sincerity. Elgar put so much of himself into this work that drawing it out takes a rare insight and intuition on the part of the interpreter. I am pleased to say that the hugely underrated George Hurst has joined the elite band of conductors to have attained that status.

EDWARD ELGAR
Symphony No.1 in A flat Major Op55/Imperial March
Op32
BBC Philharmonic Orchestra; conductor, George Hurst
NAXOS 8.550634 (DDD/53.43)

In the portraits he looks the epitome of the Edwardian gentleman, self-assured and perhaps even a little self-important. But in Elgar’s case, appearances are deceptive: he was anything but confident of his abilities and not at all certain of his place not only in music, but in English society. He readily acknowledged how much he owed to his wife, Caroline Alice, who never lost faith in him, even when his own self-belief was at its lowest ebb. The superficial impression is of a bluff, hearty, straightforward, sociable personality who also happened to develop into the finest English composer since Purcell. Look deeper, though, and you will find a man who had

CAMILLE SAINT-SAENS
Cello Concerto in A minor Op33
JULES MASSENET
Fantaisie for Cello and Orchestra
EDOUARD LALO
Cello Concerto in D minor

Sophie Rolland, cello; BBC Philharmonic Orchestra; conductor, Gilbert Varga
ASV CD DCA867 (DDD/64.47)
In any successful performance of the First Symphony, this thematic unity Elgar so carefully established has to be evident. George Hurst clearly appreciates this and as a result his interpretation has an inexorable momentum and sense of knowing where it is going. It is a thoughtful performance, and a passionate one, and one that adheres commendably closely to the detailed instructions which Elgar included in the score.

Every so often, a conductor and orchestra come together and create something which is a bit special. This happens when they have a real find and I trust they will be confident and attuned. Sophie Rolland is that find. Her recording debut on ASV with an entirely French programme, one which shows dramatic contrasts between the three movements, which are played without a break. The finale is gloriously exuberant.

Edouard Lalo was a violinist and violist of some note and it is therefore no surprise that in his D minor concerto he fully exploits the cello's expressive capabilities, witness the pizzicati of the andantino, sounding for all the world like a Spanish guitar (Lalo was of Spanish descent). The opening allegro maestoso has a Brahms-like grandeur, but the concluding allegro vivace is all high-spirited vitality, with its energetic dance rhythms and whooping hunting calls. Sophie Rolland's playing here is a delight, as it is in the Massenet, with its gavotte-like second section.

Sophie Rolland is a Canadian cellist of considerable accomplishment and even greater promise. She studied with three of the great masters of the instrument, Nathaniel Rosen, Pierre Fournier and William Pleeth and her collaborations with the Montreal Symphony Orchestra have brought the highest praise from its chief conductor, Charles Dutoit. Her Beethoven recitals in London, with the pianist Marc-Andre Hamelin prompted the Financial Times' music critic to demandings Fantaisie. She offers what are probably the two commendable boldness and imagination. Her recording debut on ASV with an entirely French accolade for a performer still in the first phase of her career.

Playing a 1674 cello by Petrus Reuta of Brescia, Sophie Rolland - as befits her French-Canadian background - makes her début on ASV with an entirely French programme, one which shows commendable boldness and imagination. She offers what are probably the two finest cello concertos written by French composers - Saint Saens' A minor and Lalo's D minor - and bridges these with Massenet's tuneful and technically demanding Fantaisie.

In the Saint-Saens, composed in 1872 when he was thirty-seven, Sophie Rolland plays with breathtaking fluency and assurance. That comparison extends to the music itself. In the Symphony Fantaisiste, Berlioz introduced the notion of the idee fixe, a motif that would permeate the entire work, be fundamental to every movement of the symphony and be endlessly metamorphosed to convey different moods. Elgar employs the same technique, but on an even more ambitious scale. The solemn, march-like theme heard in the woodwinds and violas above a pulsing bass line at the very outset of the symphony is crucial to every subsequent development within the work: it proves endlessly adaptable, suggesting a sublime tranquility as readily as it does mystery, foreboding, sadness and triumph.
And if anything at all could prepare the listener for Zero Tolerance for Silence then it is surely the fact that, despite Song X’s huge and sometimes controversial impact, Metheny himself always claimed that there were out-takes from the session which left the record standing in terms of sheer noise. Until those tapes see the light of day, you’ll have to settle for Zero.

So, what do you get for your money? A pretty stark listen, actually. The set consists of five “parts” which have no apparent thematic link beyond their actual sound, kicking off with an eighteen-minute opus and winding down with four shorter; fractionally more refined - certainly a tad gentler - five minutes. It’s all guitar; pretty much all multi-tracked distorted electric, a shock itself to all those Metheny acolytes who’ve grown to adore his characteristically “clean” jazz guitar tone or lush guitar synth. In fact, much of the time, it sounds like just two channels of electric and that’s it. No guitar synth; no lush chorus; no deep echo; it’s dry, dry, dry. Oh, with the tiniest bit of acoustic guitar thrown in for good measure - just the once, I reckon.

But, what does it sound like? Well... a mess, for a kick off. Scratchy, harsh, abrasive, atonal, often highy arhythmic, part I a wall of sound pretty much all the way and its shorter cousins dipping into garage band riffs (a real sloppy, stoned garage band, at that), quasi-Mahavisnu chord voicings shockingly detuned, and Velvet Underground droning.

And that mention of Lou Reed is interesting. The rumours kicking around about this album for some months now are that Metheny deliberately turned in a load of noisy old crap to get out of his Geffen contract - a tactic most famously taken up by Reed on his Metal Machine Music album. What bugs me about that analysis is that as soon as a truly popular musician makes a genuinely challenging musical statement, people - fans often, the worst enemies to any developing artist - have to make excuses for it: “he was strung out on drugs at that point”, “the pressure had gotten to much for him”; or, of course, “he needed to get out of his contract!”. Well, some of us now reckon that Metal Machine Music was one of the finest achievements in rock music in the last twenty years - a blazing, soaring masterpiece that prefigured - and in many cases outdistanced - most of the finest cutting edge rock music of the 80s. And Zero Tolerance For Silence?

It’s got me stumped really. This column has certainly reviewed music a lot wilder, freer, harsher; more experimental and more shocking. And very positively. But I have to say that this is one of the most perplexing records I’ve come across this year, a record almost uniquely unjudgeable, I believe. I can’t remember vacillating between two extreme opinions about a record for a long time. On one hand, I’d concur with Sonic Youth guitarist - and Geffen labelmate - Thurston Moore whose wise words about this disc have been unsubtly stickered all over its sleeve: “THE most radical recording of this decade... a new...
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Caspar Brotzmann, son of (in)famous free improvising sax monster Peter (truly one of the greatest European jazz musicians ever) has been carving out some damn fine gothic free-jazz/industrial rock sounds with his band Massaker for some years now, their Kokofoan was unquestionably one of the records of last year.

On Merry Christmas the pair turn in a set of freely improvised sound-sketches apparently recorded at a single sitting. Largely avoiding the sledgehammer rhythms of Neubauten or the splatter-rock of Massaker, the pair instead paint a dense landscape which is almost immigrant in its staticism but undoubtedly industrial in its brutal sound. Einheit scratches and bangs away seemingly on whatever comes to hand, oddly coming on like an un-jazz incantation of AMM's Eddie Prevost - while still very much his own man. And Brotzmann easily upholds his position as one of Europe's leading noise-guitarists, with a huge vocabulary of wild noises strangled at will from his guitar; definitely a man to watch for guitar freaks and improv fans alike.

Highly recommended stuff then; a million miles from anything reasonably considered jazz - but then so's the Metheny disc, and where do you reckon you'll find that in your local record store's racks? - and who cares? This is blistering, urgent improvisation strangely in the finest tradition of the noisiest European free jazz first slammed out by the likes of Caspar's dad and his mates damn near three decades ago. Highly enjoyable stuff.

Death Cube K
Dreamatorium
Strata 0001-2

- My oh my, Bill Laswell keeps damn busy. From his prolific Axiom label - home of the very finest jazz-thrash-world music-funk hybridizing to his ambient dub label Subharmonic, to one-off collaborations with the likes of UK Ambient House oneman-industry Pete Namlook (check out their recent Psychonavigation project for a first-rate exercise in truly blissful post-rave sounds), the man just keeps on pumping out music: his own, his friends', his heroes'. In a moment, a whole new label, but first up, Dreamatorium, a duet project with fellow-traveler Buckethead that goes under the fine name of Death Cube K.

Regular readers will know the score on these two by now, but, just in case... Bill Laswell bass player, composer, producer, extraordinaire, conceptualizer, bandleader, label-owner. From the early-80s avant-funk work of Material to the thrash'n'burn metaljazz of Last Exit; from production work with anyone from Motorhead or the Ramones to Herbie Hancock; with God-knows-how-many record labels to his name - Nation, Axion, Subharmonic, Strata, and now (see below...) Black Arc; as the mind behind pan-stylistic urban collagists Praxis, the first - and only! - great supergroup of the 90s; with all this, Laswell has become one of the pre-eminent creative musicians of his day, a creator so oblivious - or impervious to the boundaries of genre (the creative prison so desperately craved by the corporate music machine) as to be criminally ignored by the greater record buying public, yet an essential influence on so many of their heroes.

And Buckethead: something of a Laswell protege, a blistering young heavy metal guitar player from San Francisco whose Disney-cum-Texas Chainsaw Massacre take on the world and Funkadelic-gone-Free Jazz approach to music making might - God forbid - hinder his being taken to the hearts of all those guitar-wielding, testosterone-soaked young bucks out in 'Metal-land.

As Death Cube K, away from the powerhouse rhythm section of Praxis - in which they both feature, of course - they take a more laid-back, albeit equally (or more?) twisted approach to sound-painting. Post-rave ambient tapestries, wigged-out soundtracks to imaginary Science Fiction films, ecstatic balladic guitar soloing heavily reminiscent of Eddie Hazel from Maggot Brain-period Funkadelic, soundsculpting almost musique concrete in texture if not actual technique... all meld in a highly atmospheric/filmic composition of slowly-unfolding, yet nonetheless intense, drama. A rarely exquisite piece of work.

continued on page 95...
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ZILLATRON
Lord of the Harvest
BLACK ARC RCD10301

- And an all-too-brief mention for Laswell's newly-inaugurated Black Arc label, which seeks to bring you "black rock, cyberfunk and future blues" with a quintet of releases from The Buddy Miles Express, O.G. Funk, Slavemaster, Harware and Zillatron, this last one being the standout, for my money.

Lord of the Harvest features Zillatron AKA Fuzzface AKA Bootsy Collins, still the world's greatest funk bassist, in cohoops with fellow Praxistors Bernie Worrell (keyboards), Buckethead and Laswell, not to mention a host of vocalists from Grandmaster Melle Mel to ur-rapper and last poet Umar Bin Hassan. A righteous, voracious, genre-gobbling, sampladelic, virtuosic, deeply urban creation of huge creativity. A fine start for Black Arc, a label to which I'm sure we'll return in the future.

CAROL KIDD
Crazy For Gershwin
LNN AKD 026

- Despite the title, this is not an anthology of George and Ira's finest, as only half of the fourteen tracks are Gershwin songs, the rest being a selection of favourites and standards from writers with similar appeal; 'Stormy Weather', 'Porgy' and 'Is You Is my baby' will be titles familiar to many. The Gershwin component, of course, would not be complete without 'Summertime' and 'Ain't necessarily so', along with less popular work such as 'Little Jazz Bird' and 'Do it again'. All in all, a good selection.

The press release which accompanied my copy of this CD glibly stated that Carol Kidd 'has won every possible award and accolade for her singing', and her appeal is so mainstream that she even graced an episode of 'Barrymore' recently. This level of acceptance is the measure of Kidd's stature and ability, by which she leaves most other British jazz performers standing, and her professionalism alone makes this a recording worth hearing. However, this mainstream presentation made me uneasy. Kidd's diction leaves a lot to be desired in terms of content and soul, as it is, simply, too 'plummy' for many of the tracks. That's the opinion of an out-and-out blues man, whereas older listeners brought up with a more operatic tradition will not find this nearly as irritating as I do. That's got the subjective opinion out of the way and, even bearing that in mind, this is a recording which oozes technical excellence not only from Kidd herself, but also her backing musicians (including David Newton on piano, of whom more later) and also from the recording staff. One for Carol Kidd fans everywhere, as well as a complement to any Gershwin collection worth the name.

DAVID NEWTON
Return Journey
LNN AKD 035

- Unlike Carol Kidd's album above, on which Newton plays piano, this is original work and so there can be no comparison with other, possibly greater, artists with other interpretations. This is the author's unadulterated statement of the work.

Having listened to this album, my overwhelming impression was one of an eminently capable musician with an impressive command of musical vocabulary, able to state his message without undue pyrotechnics and prestidigitation in his playing. Under normal circumstances I would have no qualms about recommending this album but, in the light of Newton's understated work on 'Crazy for Gershwin', I have to recommend Kidd's album rather than the Newton solo. Newton, it seems, plays better in the group where he acts more as a foil for the other players and Carol Kidd, rather than as a soloist. On his solo album, Newton eschews the drive and energy needed to carry an hour of solo piano. Undoubtedly this is an artistic decision for which he has his own reasons, but the result left me feeling unfulfilled as a listener; this is a recording of an exceptional player, transcribed by Linn with their usual excellence, but again, more drive and substance would have made it outstanding, rather than simply good.
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NITTY GRITTY RECORD CLEANER
Bring a glossy shine to your LPs with the Nitty Gritty series of record cleaners. Several versions are available from the basic machine to the near fully-automated Mini-Pro (pictured) which cleans both sides of the LP together. Review in Hi-Fi World August 1994, these machines are a must for the dedicated Vinyl collector.

BASIC RECORD CLEANING SYSTEM £199.90
RECORD MASTER RECORD CLEANING SYSTEM FOR ALL SIZES (7/10/12") £249.90
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MINI-PRO 1 RECORD CLEANING CLEANING SYSTEM BOTH SIDES CLEANED SIMULTANEOUSLY £599.00

For further details and cleaning fluid cost please contact the Mail Order Department on 071 - 2660461.
AUDIO-TECHNICA RECORD CLEANING SYSTEM
Removes both dirt and static; a tiny amount of cleaning agent in the handle removes fingerprints, oil and film, while a pad lifts off dust. Pad brush and fluid are supplied.

AUDIO-TECHNICA RECORD CLEANING SYSTEM £10.50

AUDIO-TECHNICA COMPACT DISC LENS CLEANER
A disc the size of a CD, with fine brushes - one of which is dampened with cleaning fluid. As the disc spins in the player, the brushes clean the laser lens. It may not suit all machines.

CD LENS CLEANER £16.25

KONTAK
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Keep your stylus sharp and bright for perfect tracking without using fluid. Cut a strip about the size of a matchbox striker off this sheet of card and draw it gently under the stylus from back to front. One sheet of this card, with its aluminium-oxide micro-abrasive coating, should be enough to clean your stylus at least forty times.

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<th>CODE</th>
<th>HEIGHT</th>
<th>PRICE</th>
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<tr>
<td>H100</td>
<td>100MM</td>
<td>£109</td>
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<tr>
<td>H175</td>
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<tr>
<td>H900</td>
<td>900MM</td>
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ALL FRAMEWORKS SHELVES ARE 550MM WIDE BY 450MM DEEP.
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**SUPER EXSTATIC CARBON FIBRE DISC CLEANER**

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<td>£16.25</td>
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<tr>
<td>Audio Technica Green CD Ring Stabilizers</td>
<td>£6.50</td>
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<tr>
<td>Audio Technica Record Cleaning System</td>
<td>£10.50</td>
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<tr>
<td>Automatic CD Cleaner</td>
<td>£21.95</td>
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<tr>
<td>Basic Record Cleaning System</td>
<td>£199.90</td>
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<tr>
<td>Record Master Record Cleaning System (without adaptor)</td>
<td>£249.90</td>
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<td>1.5 Fully Automatic Single Sided Record Cleaning System</td>
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<tr>
<td>Mini-Pro Record Cleaning System</td>
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<td>Garrard 401 Celebration SME IV Tonearm</td>
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<td>Gold plated 4mm plugs</td>
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<td>Goldring Exstatic Mat</td>
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<td>Goldring Super Exstatic Carbon Fibre Disc Cleaner</td>
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<td>Hi-Fi World Silver Plated Copper Interconnects (1m pair)</td>
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<td>Hi-Fi World Dry Stylus Cleaner</td>
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<tr>
<td>Hi-Fi World Solid Silver Interconnects (1m pair)</td>
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<td>Kontak cleaning fluid</td>
<td>£19.00 each</td>
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<td>Laserguide</td>
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<tr>
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<td>Michell Gold-Plated Sure-Loc Banana Plugs (4)</td>
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<td>Michell Rhodium-Plated Sure-Loc Banana Plugs (4)</td>
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<tr>
<td>Milty Magnet IX</td>
<td>£10.50</td>
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<tr>
<td>Milty Triple A</td>
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<td>£81.15 (50)</td>
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<tr>
<td>Nitty Gritty Record Cleaner</td>
<td>£99.00</td>
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<tr>
<td>ONY Stylus Cleaning Kit</td>
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<td>Pixall Mill Record Cleaner</td>
<td>£10.75 each</td>
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<td>Pixall refill roller</td>
<td>£7.75 each</td>
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<tr>
<td>Record storage cube</td>
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<tr>
<td>Screened Mains Cable With 4-Way Block (1m)</td>
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<tr>
<td>Screened Mains Cable With Fig 8 Plug (1m)</td>
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<tr>
<td>Screened Mains Cable With IEC Plug (1m)</td>
<td>£19.20</td>
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YAMAHA TX-950 £260
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INTEGRATED AMPLIFIERS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H/K HK6150</td>
<td>£159</td>
<td>Good sounding starter amplifier. Great dynamic range, excellent bass.</td>
</tr>
<tr>
<td>NAD 302</td>
<td>£160</td>
<td>Lots of insight and detail, but could sound a little rough in the wrong system.</td>
</tr>
<tr>
<td>PIONEER A-300X</td>
<td>£200</td>
<td>Exceptionally sweet mid and treble, plus the superb dynamic range of the A400.</td>
</tr>
<tr>
<td>DENON PMA-350II</td>
<td>£220</td>
<td>Powerful and with deep sweet rhythmic bass drive.</td>
</tr>
<tr>
<td>H/K HK6550</td>
<td>£349</td>
<td>Thoroughly refreshing, tonally neutral amplifier with a realistic price tag.</td>
</tr>
<tr>
<td>AUDIOLAB 8000A</td>
<td>£430</td>
<td>Very neutral and superbly built. Good bass, great imagery, but can be sterile.</td>
</tr>
<tr>
<td>J/SHIRANE Phase2</td>
<td>£495</td>
<td>Gorgeous looks, even better sound. Tight, quick bass and valve-like mid and treble.</td>
</tr>
<tr>
<td>MISSION CYRUS III</td>
<td>£499</td>
<td>Superb engineering, a solid cast chassis and a clear and spacious sound.</td>
</tr>
<tr>
<td>SUGDEN A21a</td>
<td>£639</td>
<td>Class A transistor amp. Sharp, crisp, deep, tight, and it images well too.</td>
</tr>
<tr>
<td>AUDIONOTE OTO</td>
<td>£1250</td>
<td>Valve integrated amplifier with a sweet, open and detailed sound.</td>
</tr>
</tbody>
</table>

PRE-AMPLIFIERS

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<thead>
<tr>
<th>Product</th>
<th>Price</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAR 834P</td>
<td>£290</td>
<td>MM/MC phono stage. Uses valves to create a rich sound with tremendous depth.</td>
</tr>
<tr>
<td>A. Innovations L1</td>
<td>£299</td>
<td>Valve line level preamplifier. Outstanding results with vdh carbon interconnect.</td>
</tr>
<tr>
<td>A. SYNTH. PASSION</td>
<td>£475</td>
<td>Or £275 for the kit version. Unrivalled transparency from a passive pre-amp.</td>
</tr>
<tr>
<td>ROSE RV23-5</td>
<td>£495</td>
<td>Valve/Transistor hybrid. Smooth and clean, rich and spacious.</td>
</tr>
<tr>
<td>DPA DSP 200S</td>
<td>£495</td>
<td>Not quite the 50S, but there's still nothing to match it at the price.</td>
</tr>
<tr>
<td>MICHELL ISO HR</td>
<td>£850</td>
<td>Impossible not to recommend. What more does your vinyl want?</td>
</tr>
<tr>
<td>NAIM NAC82</td>
<td>£2000</td>
<td>Remote control preamp. The NAC82 thrusts detail forwards in true Naim fashion.</td>
</tr>
</tbody>
</table>

POWER AMPLIFIERS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>ROSE RP-190</td>
<td>£495</td>
<td>Used with the Rose pre-amp it gives 70 watts of smooth relaxing sound.</td>
</tr>
<tr>
<td>SUGDEN AU41P</td>
<td>£530</td>
<td>100 Watts of smooth, detailed, full bodied sound. And at a bargain price.</td>
</tr>
<tr>
<td>QUAD 606</td>
<td>£675</td>
<td>140W powerhouse. Smooth and civilized, with the legendary Quad back-up.</td>
</tr>
<tr>
<td>DPA DPA 200S</td>
<td>£750</td>
<td>Not as cold as the 505S. Better than anything else at the price.</td>
</tr>
<tr>
<td>MICHELL ALECTO (S)</td>
<td>£1300</td>
<td>Valve like transparency, big warm easy going sound.</td>
</tr>
<tr>
<td>MICHELL ALECTOS</td>
<td>£1800</td>
<td>The Alectos have a lucidity and three dimensional realism that is rarely attained.</td>
</tr>
<tr>
<td>NAIM NAP180</td>
<td>£898</td>
<td>Partner to NAC82. Has real drive and grip on loudspeakers.</td>
</tr>
<tr>
<td>CHORD SPM 1200</td>
<td>£2995</td>
<td>Massively powerful, dynamic and detailed sound. Among the best of solid state.</td>
</tr>
<tr>
<td>E.R. YOSHINO</td>
<td>£25,000</td>
<td>Single-ended valve design. Noel is still suffering withdrawal from this product.</td>
</tr>
</tbody>
</table>

LOUDSPEAKERS

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<thead>
<tr>
<th>Product</th>
<th>Price</th>
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<tbody>
<tr>
<td>R'ALLAN MINETTEII</td>
<td>£120</td>
<td>Fast and lively sounding, competent bass.</td>
</tr>
<tr>
<td>GILL MAXIM</td>
<td>£120</td>
<td>Replacing the Maxim 3; not as tight in the bass but still one of the best at the price.</td>
</tr>
<tr>
<td>MISSION 7605E</td>
<td>£150</td>
<td>One of the best miniatures around, very musically involving.</td>
</tr>
<tr>
<td>HARMAN LS 0300</td>
<td>£200</td>
<td>Glass fibre woofer gives a forward and open mid with good bass kick.</td>
</tr>
<tr>
<td>TDL RTL 2</td>
<td>£250</td>
<td>Bass on a budget. Solid, vibrant and spacious sound.</td>
</tr>
<tr>
<td>SYSTEMDEK 93I</td>
<td>£300</td>
<td>Poor man's LS3/5a? Coherent and involving, these little gems really sing.</td>
</tr>
<tr>
<td>HARBETH HL-P3</td>
<td>£400</td>
<td>There probably isn't a more neutral sounding design anywhere near the price.</td>
</tr>
<tr>
<td>ROGERS LS8a/2</td>
<td>£449</td>
<td>Big, enjoyable, room filling sound from this 2-way floorstander.</td>
</tr>
<tr>
<td>REL STRATA</td>
<td>£499</td>
<td>REL's Strata offers excellent bass depth and power.</td>
</tr>
<tr>
<td>H'BROOK QUARTET</td>
<td>£555</td>
<td>Sensitive enough to work with low power valve amps. Fast and detailed sound.</td>
</tr>
<tr>
<td>JPV/RUBY 1</td>
<td>£500</td>
<td>Metal driver 'speaker with an exciting and lively presentation.</td>
</tr>
<tr>
<td>TANNYO D100</td>
<td>£650</td>
<td>Believable 3D images produced by this small dual concentric speaker.</td>
</tr>
<tr>
<td>PROAC Studio 100</td>
<td>£699</td>
<td>Excellent monitors with detailed, natural sound and plenty of atmosphere.</td>
</tr>
<tr>
<td>SPENDOR SP2/3</td>
<td>£769</td>
<td>Smooth sounding speaker with a superb mid-range. Very easy to listen to.</td>
</tr>
<tr>
<td>PROAC RES 1 S</td>
<td>£918</td>
<td>Small box design. Can convey the spirit, drive, and passion of music.</td>
</tr>
<tr>
<td>TANNYO GRFM</td>
<td>£3500</td>
<td>Gigantic loudspeakers. Capable of awesome sound. Need good valve amplification.</td>
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<tr>
<th>DESCRIPTION</th>
<th>PRICE</th>
<th>SAVE</th>
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<tr>
<td>B &amp; W 610i</td>
<td>£209</td>
<td>£40</td>
</tr>
<tr>
<td>KEF Q30</td>
<td>£299</td>
<td>£50</td>
</tr>
<tr>
<td>KEF Q50</td>
<td>£429</td>
<td>£70</td>
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<tr>
<td>MISSION 7631</td>
<td>£299</td>
<td>£80</td>
</tr>
<tr>
<td>JPW AP3</td>
<td>£179</td>
<td>£50</td>
</tr>
<tr>
<td>JPW P1</td>
<td>£120</td>
<td>£40</td>
</tr>
<tr>
<td>TANOY 607 MK11</td>
<td>£169</td>
<td>£50</td>
</tr>
<tr>
<td>TANOY 611 MK11</td>
<td>£339</td>
<td>£90</td>
</tr>
<tr>
<td>MARANTZ PM 700 AV</td>
<td>£369</td>
<td>£80</td>
</tr>
<tr>
<td>KENWOOD KRV 7050</td>
<td>£340</td>
<td>£59</td>
</tr>
<tr>
<td>KENWOOD DP2050</td>
<td>£145</td>
<td>£25</td>
</tr>
<tr>
<td>ROTEL RA940 BX</td>
<td>£189</td>
<td>£60</td>
</tr>
<tr>
<td>MARANTZ CD63</td>
<td>£225</td>
<td>£25</td>
</tr>
<tr>
<td>MARANTZ SR53L</td>
<td>£219</td>
<td>£50</td>
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STACKING 'STATICS

Recently I have been totally seduced by a pair of Quad Electrostatics. The benefits of these speakers far outweighed the weaknesses - I'm smitten! This is why I'm writing to you.

I listened to a pair of ESL-63s. However, I would like to stack them with another pair, which I'm told can't be done with the ESL-63s. In order to stack Quad electrostatics I have to buy the old type. This is where my questions begin!

How do the old electrostatics differ in sound compared to the ESL-63s? What different variations are there for stacking these speakers?

I wrote off to Quad and they suggested stacking one on the top of the other, although details of materials to be used.

Write in with your problems to Hi-Fi World, 64 Castellain Road, Maida Vale, London W9 1EX.

Our panel of experts will endeavour to solve them, or at least offer some practical advice.

The old (original) electrostatic does not go as loud as the '63, although you get more volume with stacked pairs of course. Quad will renovate the old model and fit it with the latest protection circuits used in the '63.

The original model has a brighter, clearer sound that many prefer to that of the '63, but removing the grilles of the '63 gets rid of most of its dullness, even though this isn't the basic source of their differences (there are high frequency losses down the delay line of the '63 that contribute to its softer sound).

As you note, Alastair Robertson-Aikman's set-up (founder of SME) has them in an L formation, driven by massive Krell amplifiers. This is Quad's recommendation for paired 63s. They sit behind a curtain (electrically powered, no less) that stretches across one end of a massive listening room. I think it's true to say that Alastair's system is the toast of the industry. He's very proud of it and listeners leave in awe. I should say, however, that this system isn't about massive bass and searing highs, etc, etc ('domestic disco'). It is about a completely natural and believable sound stage behind the curtain, with full scale singers on it. The illusion is fabulous.

So back to the practicalities. The old models are most conveniently stacked. They become intrusive, but do not take up much floor area; increased
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<tr>
<th>Phone</th>
<th>Fax</th>
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<tbody>
<tr>
<td>0252 - 377952</td>
<td>0385 - 317952</td>
</tr>
</tbody>
</table>

**Secondhand/Ex Demo equipment:**

- Acoustat Mod 3 electrostatics £1500
- Croft Super Micro-A £350
- Musical Fid. A370 £1000
- Oracle Delphi + Linn Itok £600
- Sonus Faber Electa £1300

Anywhere in the South.
baffle area improves bass as well. Don't worry about materials unduly. Use strong, non-resonant wooden or welded angle iron frames; you'll have to remove the wooden end cheeks. Get a service manual from Quad first to acquaint yourself with the unusual construction of these speakers and install the lower one upside down. You must connect them up in parallel to a powerful solid state amplifier capable of handling low loads (e.g. Naim), or bi-amp (i.e. one amp per loudspeaker). Quad's technical information sheet No. 021 gives enough information on stacking. If you find this inadequate, then let discretion be the better part of valour: get someone else to do it. Try Lockwood Audio for a start at Imperial Studios, Maxwell Road, Borehamwood, Herts WD6 1WE, tel: 081-207-4472. They told us they hadn't experience with this, but could tackle the task. Quad told us they were not aware of commercially available frames, and neither are we. If you go for ESL-63s, experiment with pairs on the floor or on stands, with one pair facing toward you as normal, whilst the other is swung around so that the radiating centres (30cm behind the centre of the speaker) remain nearly coincident with the forward facing units (see diagram a).

Discussing this problem in the office we realised that the theoretically ideal way of arranging dual-63s is in anti-phase push-pull (see diag b), one facing forwards, one backwards and connected in-phase so that rear radiation cancels out and you end up with a single spherical expanding wavefront emanating from a single notional point source. Quad agreed this is correct, but as yet we haven't tried it. It remains a good idea to hang one or two layers of heavy carpet underneath between the speakers, to act as sound absorbing 'curtains'. Keep them a minimum of 4in away from the speaker.

Alastair has re-mounted his 63s onto stout wooden frames, sans grilles and dust covers. However, since this is potentially dangerous, we do not recommend it except to those who know what they are doing. All electrostatic loudspeakers carry lethal voltages (2500V) and can kill. Bear this in mind before you get too bold. NK

**NEW ROOM BLUES**

About six months ago I sold all my vinyl and purchased a CD player and speakers to add to my existing amplification.

System: Teac VRDS-10 connected to Cyrus I/PSX with Audioquest Emerald interconnects. Speakers are Mission 751s bi-wired with Linn K400 speaker cable. The speakers are blue-tacked to sand-filled Target HS24 speaker stands. The CD player and amplification sit on top of two Target TT2 tables.

I purchased my system at another house. The old listening room had a concrete floor and an unobstructed wall for the speakers to sit in front of. The sound was gorgeous. All my reservations about CD were put to rest for good. I have now moved to a new house and things have changed.

My new house has a wooden sub floor, large windows, and the only place the speakers can be sited are either side, but in front of the fireplace. (The room is sort of L-shaped open plan style).

It doesn't sound awful or anything, it just doesn't sound anywhere near as good as it did before. The bass isn't as deep or rich as it was and the treble can sometimes have a really nasty sting. It's just not as friendly as it used to be. What can I do? I've thought that a change of amplification could be the answer. What do you think?

Oh! By the way, I've just received the CDs I ordered some time ago. It was worth the wait. Thanks! I'd just like to take this opportunity (yes, you've guessed it!) to congratulate you on a brilliant magazine. I've been buying for a good few years now and have never been disappointed to date. Congrats!

I hope you can help with my problem.

**Simon Blake**

**Sketty, Swansea.**

Obviously, you have a room problem, but unfortunately you do not give us room dimensions or speaker position relative to the walls. Consequently, we can only generalise on what might be wrong, and what the solutions could be.

Let me get the most intractable problem out of the way first - that your room is L shaped. Once, just once, I had to try and make a system work in a large T shaped room and it never really sounded right. I have been told that L shaped rooms can be a pig too. What to do? Try sitting fairly close to the speakers, say 6-10ft away, to get their 'near-field' sound with less contribution from the room. I'd suggest you do what I did when moving into a new room recently and carry out a whole series of tests, moving the speakers to various sensible and usable positions and checking out the basic balance.

Although pushing the Missions back against the rear wall will potentially deepen bass and add body, do try pulling them forward progressively too, since rear reflecting surfaces always put in an anti-phase suck-out in the forward response (at a quarter wavelength distance in front of the wall) that becomes more obvious with decreasing distance. This may be giving you a loss of lower midrange frequencies that makes the system sound worse than before.

The bright sound is almost certainly due to reflection of treble off hard surfaces. This means the walls, floor and ceiling. The further away you sit from the speakers, the worse it will get. Let's start with the floor - it must have carpet on it, and preferably heavy felt underlay beneath that.

Then there's the oft-forgotten ceiling. If this is low (8ft) it too will be reflecting treble down with little loss, but there's little you can do about it, although a large fabric covered lamp shade may well help by breaking up/absorbing treble energy.

Keep the speakers away from side walls too, since treble will bounce off these. Wall hangings, books in bookcases, curtains, even pictures on or against the walls can help break up treble and absorb it.

Finally, try building up a foam wall around the tweeter with draught excluding strip to prevent it from beam ing upward and sideways. Stand at the side of the speaker and use your ears - it's as easy as that.

What you can see from all this is that heavy furnishings work wonders in breaking up and absorbing sound, producing a 'natural' sounding environment. I always remember that putting two settees and an arm chair into a lounge magically cleaned up its bass (by absorption). A canny Scots neighbour of mine has lots of wonga, but she buys all her furniture second hand, finding all sorts of amazing bargains because, it seems, nobody values second hand furniture. She bought a fabulous fabric covered Chesterfield suite that cost thousands at Harrods for just a few hundred pounds (the owner was an American Admiral who had suddenly been posted back to the States). Why not try this route? It might take a bit of legwork, but it's a great way of furnishing your home and getting a good sound too. NK

Continued on page 119...
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... Continued from page 117

**VINTAGE SINGLE-ENDED**

My listening room is small, meaning I'm x 14'. My system is as follows: Alphason Sonata/Xenon MCS/Goldring Eroica turntable, arm and cartridge combination, Rotel 955AX compact disc player, a pair of Heybrook HBF speakers on open Target stands, Leak Stereo 20 (modified by Croft) and Audio Innovations 800c amplifier. The speakers are bi-wired using Linn cable and 1mm solid core lighting cable. Generally I'm quite pleased with the sound, but I would like smaller speakers that imaged better. Any suggestions please?

Subsequently I learned that these are in fact very common. One certainly lives and learns.

Finally, would a phono stage be advisable? Currently I use the Audio Innovation's own phono stage with two Ortofon transformers for the moving coil cartridge.

M.J. Dennis

Worthing,

Sussex.

For good imaging try the Castle Durham 900 loudspeakers (£279), which come in handed pairs (tweeter on inside edge of front panel) for optimum stereo imaging. The new Celestion 5s are good too and sensitive as well at 88dB. Remember, you need good sensitivity for the Stereo 20, because it doesn't have much power. Try and get a demo first of course.

Single-ended amplifiers do have a magic about them that, technically, is a bit baffling. I hardly believed Ongaku when I heard it; if it was right, everything else was wrong. And, irrespective of such questions about the nature and meaning of the universe (and all that) even if it wasn't right, it was damn impressive! Yoshino I actually got to live with for a good, modern single-ended amplifier. NK

**LEAVING THE GHETTO**

I need help! Not the mental variety, but more on the hi-fi front. I am a young guy who is about to embark on the road to acoustic enlightenment.

For years I have listened to music from my portable ghetto blaster; highly questionable in itself. Now I am looking to buy a set of separates.

I have £800-£1000 to spend and am looking for an amplifier, a CD player and a set of speakers. Most of the shops in my area are only too happy to bounce names and packages off me; however, each one seems to contradict the other.

I am a student and the money I will spend represents a hell of a lot to me, so I don't want to buy rubbish. I've been shown Marantz, NAD, Arcams, Bose, Solid, Tannoy Sixes etc.

My needs are simple. I want a system that can churn out loud music with heavy bass lines for the next few years and yet in 5-10 years' time will deal with the intricacies of classical and jazz without being, for want of a better word, knackered.

Is this possible? I am new to this game and think retailers see me coming. Please, please can you help.

Your suggestions would be warmly received. HELP!

Mathew Croxford

Glasgow,

Scotland.

Loud, with heavy bass and long life huh? That places emphasis on the loudspeakers and Tannoy immediately spring to mind. Their speakers are sufficiently well designed and developed to give as much low bass as possible from domestically acceptable cabinets, of healthy, but not overpowering level. They're also tough and go loud and, of course, because Tannoy are in Glasgow, should they suffer at your hands you can pop around the corner to get them fixed. Try auditioning 603s or, for more bass, 605s. These speakers are right up your street (almost literally).

For Tannoy's I'd suggest an amplifier that runs deep, but stays tight, which cuts out choices like the Pioneer A-400X because of its slightly 'enhanced' bass, but welcomes the Denon PMA-350II. This unit is a real power house too and should be ideal for you, as well as a good match for the Tannoy's.

Now to the all-important source, as another Glasgow based manufacturer might say. At your budget level and for your requirements a Rotel RCD-965 Discrete CD player will slot in nicely, giving you a fast, clean-sounding system with plenty of bass. NK

**NATTY TUNER**

I've been putting together a hi-fi system over the last few

Continued on page 121....
**Sussex Surplus**

**Valves Mostly UK.**

<table>
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<tr>
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months and now I'm looking to acquire a tuner. I heard and liked the Naim NAT 01, however it costs £1500 so I decided that I'd never heard of it as a sort of self-induced psychological ploy (unless of course I come across it second-hand at a vastly reduced price).

Now I'm looking at other, older and valve tuners (thanks to you) and I'm particularly interested to find out about Revox and Leak tuners, specifically the Troughline.

Thing is, as far as I know, they don't make Troughlines any more so I'd have to get one second hand and I'd be taking a chance that everything's OK 'under the hood', not to mention not being able to make direct A/B comparisons.

Because of this I have a few questions I'd like to ask you. Firstly, like in the case of the various Naim models (I don't expect the Troughline to be as good as the NAT 01 by the way), is the Troughline MK I a 'better' or not-quite-so-good model as the MKII and III? Or is it, as in the case of the recently re-vamped Audiolab 8000 DAC, the first model that was superseded by the second and whether one was better than the other was left up to personal taste to decide?

Secondly, I understand that it would be good to get it checked out, but don't know where. Thirdly I've heard talk of getting new decoders and power supplies for it (I don't pretend to actually know what a decoder is). If so, which ones should I try? And fourth is there anything else that I should keep an eye out for that would improve its performance still further?

Hassaan Ali
Ilford, Essex.

The Leak Troughline can be heard at Radlett Hi-Fi, Radlett, Herts. They'll tell you all about the various difficulties with regard to stereo decoders (phone David Wren at 0923-856497). I prefer it to all solid state tuners, but there are a number of practical difficulties to be considered before buying one. Old tuners like this need to be renovated and re-aligned. It's a complex task requiring expensive test equipment and considerable skill in VHF radio. Even when a Troughline is up and running properly, it is very insensitive, needing at least 3mV or so from the aerial for best results. That means using a large aerial and, in Ilford, Essex, you may well find that signal strength from Wrotham is barely adequate.

Regular readers will know that, these days, we recommend the new NAD402 tuner as a more amenable alternative. It might not be quite as breathtaking in its sound as a Troughline, but it comes at a fraction of the price and it even has push-button tuning.

HARSH TREBLE

I have recently purchased a Marantz CD-725E CD player and Naim 72 pre-amp with HICAP and NAP250 power amp. This new equipment has given me a problem in that my old Chartwell/Rogers have become very bright and harsh in the treble. Not surprising really as they're 12 years old. So with £800 to spend I started to read up on new speakers. Wow, what a minefield! Where do I start?

Do I listen to: Mission 753s, TDL O.75/Studio 1s, KEF Q50-60-70s, Systemdek 939s, Spendor SP2/3s and so on.

Where will I find all these speakers? Does any one stockist have them all? Will they let me try them at home etc? I am looking for an exciting, punchy and passionate sound. My music taste is from Bruce Hornsby, Eric Clapton, Dine Straits, etc. to Dina Carroll, Oleta Adams, Luther Vandros to Kenny G., Grover Washington Jr. etc. No heavy metal or classical.

My room is 16 by 14ft.

I would be grateful for your assistance in this matter. I appreciate that speakers are a matter of personal taste, but some indication as to what would suit my amp and taste would be very much appreciated. (I do prefer floor standers).

Ian Seabrook
Borough Green, Sevenoaks, Kent.

I'd say it was surprising that your system should develop the harshness you describe, indicating the speakers are revealing a property of the new components not to your liking. New speakers are unlikely to do much to alleviate this problem, although they may well - if you are lucky - make the best of a bad effect and place more attention on other strengths.

Ideally, in my view, you should first try to sort out the source of your current dissatisfaction; hastily changing speakers might be wasting money. The best way to do this is by substitution. Both your amplifier and your CD player are not known for being especially laid back; they're the choice of those who want a really vivid, dynamically challenging sound with pace and control in order to best play the sort of bass lines that are important to funk and soul.

You may have to balance this attribute against some upper midrange and treble hardness; there are always trade-offs - the perfect system hasn't been invented.

Ideally, you should try listening to a Pink Triangle Ordinal CD converter, swapping between 18-bit and 20-bit filters. The Ordinal is super clean and relaxing, whilst at the same time avoiding treble dullness. Alternatively, if this is beyond your budget, then an Arcam Alpha 5 CD player may well suit.

Your Naim amp suits your musical tastes so any change, whilst making the system less challenging, may also seem retrograde to you.

I'd agree with Noel, the CD player should be investigated. The Marantz CD-725E, good though it is, isn't really in the same league as the £2500 Naim amplifier set-up you have which will ruthlessly reveal its faults. I'd use it as a transport alone and use an external DAC, like the Ordinal.

For speakers I'd listen to three, ideally in your own home and system, as the room can have a strong effect on the final performance of a speaker. Try Castle Chesters for their powerful bass and good midrange detail, ProAc Studio 100s for their energy and excitement, though they may be a little too bright for you, and Spendor SP2/3s, which have a fantastic mid and treble and good bass punch, but limited depth. The Spendors work well against a wall, the ProAcs well out into the room, and the Chesters somewhere in between.
**A MANTRA AUDIO**

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<td>Listening</td>
<td>Room</td>
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MUSICAL FIDELITY speakers Reference 3's. Black. Reasonable for sale. Very efficient Bi-wireable.


DELTEC PDM1R £299 including DC DAC DAT Analog MM/MC headphone input record motorised volume everything boxed and instruction manual. As new £290 now £550. Tel: 0502 476249.

NAP 140 & Hicap power (old) £800. SBL speakers £1,100. 2 x 5m NAC44 cable. £15. All boxes, manuals & interconnects.

TELEPHONE 0734 847410 (Reading).

NAIM EQUIPMENT for sale by execution: NAC27 (new) £452. NAP140 & Hicap power (old) £800. SBL speakers £1,100. 2 x 5m NAC44 cable. £15. All boxes, manuals & interconnects.

TELEPHONE 0734 847410 (Reading).

GARRARD 301 with Strobe platter, wooden plinth, Connoisseur arm. Very good condition £180 o.n.o. GARRARD 401 wooden plinth, good condition £120 o.n.o. May consider exchange. TELEPHONE 0382 464681.

FOR SALE: A pair of Leak TL12+, just overhauled by Station Sounds £500. As new £650. Rotel RC 870 pre £190. £700. 126 MKII arm £135.00. Rega RB 300 £250. Telephone (0347) 822253, evenings.

FIND STREET 15" stands. Heavy, 3 legs, spikes 88p. £50. £900. £250. Telephone (0347) 822253, evenings.

GOOD HOME WANTED for hi-fi, turntable plus arm, £75. Arcam Alpha 3 tuner £75. Phone (0347) 822253, evenings.

TARGET ST 15" stands. Heavy, 3 legs, spikes 88p. £50. £900. £250. Telephone (0347) 822253, evenings.

PRIVATE SALE: Pentachord original uncharged vgc £15. Diode monitor gold Lancasters. Rok D1 transport, Rok D1A DAC, Rok D1 power supply, 12 months old, hardly used moved to fit to close to therefore sale. Highest offer takes equipment. Also 4 Mission Isolaps and 2 shelf Ashpsilon rack. TELEPHONE 081-650 0765.

PRIVATE SALE: Pentachord pentacoumons (active stereo crossover) £350.00 o.n.o. Oreille DA 180 D A.C. £400.00 o.n.o. Audiolab 8000P Power Amp £400.00 o.n.o. Deltec Goretex Black Sink Stereo interconnect (WBT locking housing) 0.5m £50.00. XLO RS dedicated Digital Cable 0.5m £50.00.

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MUSICAL FIDELITY Pre-amp MXV-2, boxed, immaculate £95 o.n.o. TELEPHONE (0903) 261931 (Surrey) after 6pm.

PRIVATE SALE: Pentachord pentacoumons (active stereo crossover) £350.00 o.n.o. Oreille DA 180 D A.C. £400.00 o.n.o. Audiolab 8000P Power Amp £400.00 o.n.o. Deltec Goretex Black Sink Stereo interconnect (WBT locking housing) 0.5m £50.00. XLO RS dedicated Digital Cable 0.5m £50.00.

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Quad 67 c.d.
Gust ELS 63 + Gradient
Shooster
Kef 107.2 + Kube rosewood
B&W 802
Ensemble PAI Reference (review June HiFi News)
Wilson Watt 3 Puppies 10 + stds
Monitor Audio Studio
Kef 107.2 + Kube rosewood
Quad ESL 63 + Gradient
Martin Logan Quest
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Hi-Fi World August 1994

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**TRADE**

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